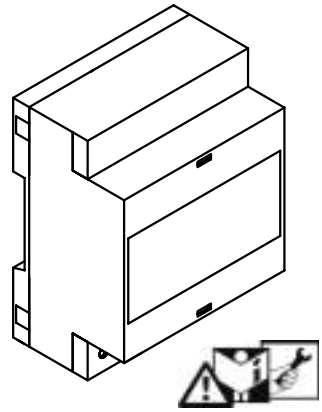


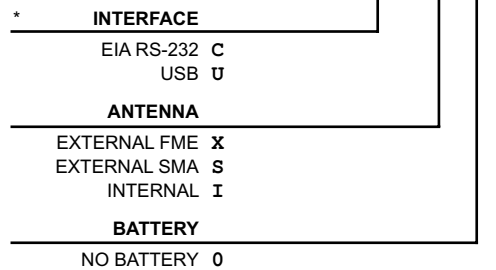
**Mobi.Modem**  
INDUSTRIAL GSM TERMINAL



This device complies with Part 15 of the FCC Rules  
CONTAINS FCC ID N7NQ2687

**EN USER GUIDE**

**Mobi.Modem 2510.0C.S0**



STANDARD VERSION: 2510.0C.S0  
OTHER OPTIONS ON REQUEST  
ANTENNA IS NOT PROVIDED AND  
MUST BE PURCHASED SEPARATELY

- \* RJ45 CONNECTOR AVAILABLE ON THIS UNIT PROVIDES EIA RS-232 INTERFACE TO BE CONVERTED BY MEANS OF EXTERNAL ADAPTER CABLE (INCLUDED) TO:
- SUB-D 9 POLE FEMALE DCE CONNECTOR, OR
  - USB STANDARD PLUG TYPE A FULLY COMPLIANT WITH THE USB 2.0 SPECIFICATION

**CARE AND MAINTENANCE**

Your Mobi.Modem is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestion below will help you to enjoy this product for many years.

- Do not expose the unit to any extreme environment where the temperature or humidity are out of operating range.
- Do not use or store the unit in dusty or dirty areas.
- Do not use chemical cleaning agent on the unit or the SIM card.
- Do not attempt to disassemble the unit or remove any part or label.
- Do not expose the unit to water, rain or spilt beverages. It is not waterproof.
- Do not abuse the unit by dropping, knocking or violently shaking it. Rough handling can damage it.
- Do not place the unit alongside computer discs, credit or travel cards or other magnetic media. The information contained on these devices may be affected.
- This unit is under your responsibility. Please treat it with care respecting all local regulations. It is not a toy: keep it in a safe place and out of the reach of children.
- Treat the SIM card with the same care as your credit card: do not bend or scratch or expose it to static electricity.
- Keep your unlock and PIN codes in safe place.

Both fixed and mobile applications are allowed, as defined below:

**Fixed** means that the device is physically secured at one location and is not able to be easily moved to another location.

**Mobile** means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm (8 inches) is normally maintained between the transmitter's antenna and the body of the user or nearby persons.

Do contact an authorized service center in the unlikely event of a fault in the unit.

**WARRANTIES**

CONTRIVE GUARANTEES FOR TWO YEARS FROM THE DATE OF MANUFACTURE OF ITS PRODUCT TO REPLACE, OR, AT ITS OPTION, TO REPAIR ANY PRODUCT OR PART THEREOF WHICH IS FOUND DEFECTIVE IN MATERIAL OR WORKMANSHIP OR WHICH OTHERWISE FAILS TO CONFORM TO THE DESCRIPTION OF ITS SALES ORDER. CONTRIVE MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY EXPRESS OR IMPLIED. IN NO EVENT SHALL CONTRIVE BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY NATURE WHICH MAY ARISE IN CONNECTION WITH SUCH PRODUCTS.

**THE WARRANTY DOES NOT APPLY IN CASE OF IMPROPER USE**

**SAFETY INFORMATION**

- Do not install this unit near medical devices like pacemakers or hearing aids. This unit may interfere with the operation of these devices.
- Switch off this unit when flying. Secure it so that it cannot be switched on inadvertently.
- Do not install this unit near petrol stations, fuel depots, chemical plants or blasting operations when this unit can disturb the operation of technical equipment.
- Interference can occur if this unit is used near televisions, radios or personal computers.
- If the device has been stored in a cold environment, condensation can occur. Before starting operations, the device must be absolutely dry. Thus, an acclimatization period of at least three hours must be observed.
- In order to avoid possible damage, we recommend that you only use the specified accessories. These have been tested and shown to work well with this unit.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

This device should be installed only by qualified personnel. Carefully read the instruction manual in its entirety and keep it safe for future reference. It is essential to know the information and comply with the instructions given in the manual to ensure the fitting is installed, used and serviced correctly and safely. This RF unit is not designed for and intended to be used in portable applications (within 20 cm or 8 inches of the body of the user) and such uses are strictly prohibited. This unit is not authorised for use as critical component in life-support devices or systems unless a specific written agreement has been given.

If incorrectly installed in a vehicle, the operation of GSM device could interfere with the correct functioning of vehicle electronics. Verification of the protection of vehicle electronics should form a part of the installation. Regulations must be considered to operate a vehicle's light or horn on public roads. No complex software or hardware system is perfect. Bugs are always present in a system of any size.

In order to prevent danger to life or property, it is the responsibility of the system designer to incorporate redundant protective mechanism appropriate to the risk involved. All units are 100% functionally tested. Specifications are based on characterisation of tested sample units rather than testing over temperature and voltage each unit. Contrive disclaims all liability for damage to the fitting or to other property or persons deriving from installation, use and maintenance that have not been carried out in conformity with this instruction manual, which must always accompany the fitting.

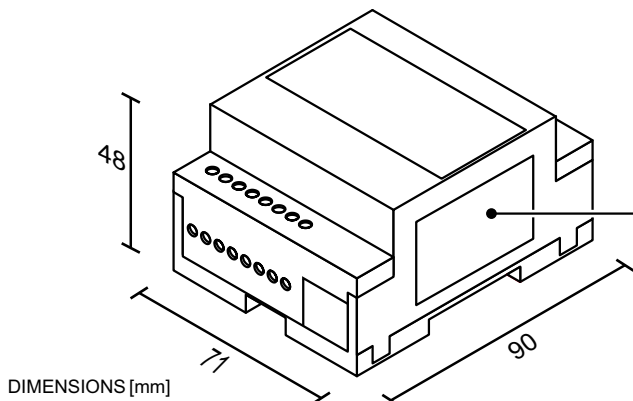
**PRODUCT DESCRIPTION**

Mobi.Modem is an industrial DIN rail GSM modem for for the transfer of data, SMS and faxes in GSM networks. Industrial standard interface and an integrated SIM card reader mean it can be used rapidly, easily and universally to quickly implement new applications in telemetry, telematics and remote control. All interfaces are integrated in the housing. The connections are suitable for use in domestic and industrial environments.

**PRODUCT FEATURES**

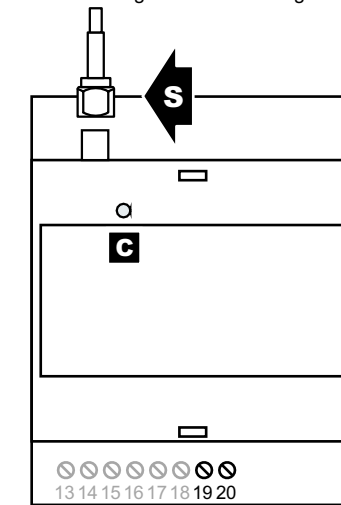
Quad band GSM / GPRS / EDGE communication with manual / automatic selection on bands 850 / 900 / 1800 / 1900 MHz for data, sms, data and voice applications.

- Output power: Class 4 ( 2W for GSM850 and EGSM900 )  
Class 1 ( 1W for DCS1800 and PCS1850 )
- Temperature: -40 to 85°C  
-20 to 60°C recommended for battery
- Relative humidity: operating 5 to 95% non-condensing  
storage & transport 5 to 95% condensation allowed outside
- Enclosure: EN-50022 rail 4 modules, polycarbonate, UL94 -V0
- Overall dimensions: mm 71 x 90 x 48 ( W x H x D )
- Weight: 200 g
- Degree of protection: IP 40 (EN-60529 / IEC 529) properly fitted

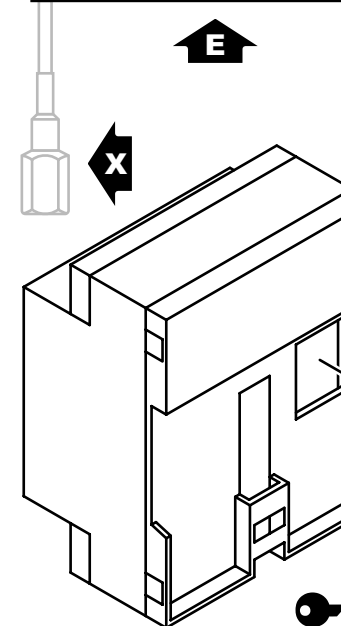


**INSTALLATION**

This unit can be installed on any standard EN-50022 rail by simple snap-in. For safe operation, the unit must be installed only by qualified personnel in an enclosure which prevents accidental contact with hazardous voltages. Protection degree IP40 must be guaranteed, raised to IP54 for open air application.



- F. RJ socket - COM port
- C. GSM operation blue LED indicator
  - OFF No power supply
  - ON PERMANENTLY Module switched ON Not registered on the network, missing SIM or invalid PIN
  - SLOW FLASH 200ms ON / 2s OFF Module switched ON Registered on the network
  - QUICK FLASH 200ms ON / 600ms OFF Module switched ON Registered on the network Communication in progress
- E. Power supply terminals 2 x 2,5mm<sup>2</sup> (AWG14)
- X. FME antenna connector
- S. SMA antenna connector



Disconnect all power supplies and battery before to insert or remove the SIM card. Replace the plastic cover before to operate the unit.

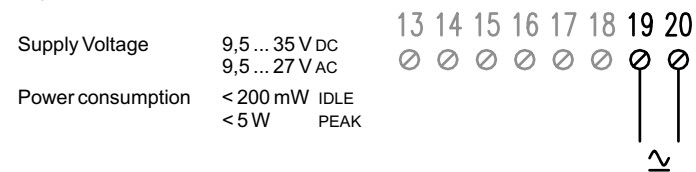
F. SIM card holder  
3V and 1,8V SIM card allowed

**SIM PIN**  
If the PIN code is enabled use AT+CPIN command to unlock the SIM card. Enable or disable the verification of PIN code either with the help of a mobile phone or with the command AT+CLCK.

**WARNING**  
If you provide a wrong PIN number the device will not operate. If you enter the PIN 3 times incorrectly, SIM card will lock up and you must provide the PUK (PIN Unblocking Key).

**POWER SUPPLY**

This unit can be supplied either by alternating or direct current, polarity independent, in a wide voltage range. Power supply connection terminals 19 and 20. The power supply must not be shared with other equipment: suggested power supply source is a simple 12V<sub>AC</sub> / 10VA transformer.



An automatic 2-pole circuit breaker or equivalent protection capable of disconnecting circuit in the event of short circuit or over-current condition should be placed on the AC mains side of power supply unit. Maximum permissible connection length between device and low voltage supply source is 3 m.

Please perform the following tasks after receiving the product:

- Inspect the unit for damage. If the unit appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct unit by checking the label on the right side of the unit.
- If you have received the wrong model or the device does not function properly, contact your supplier.

**RJ45 SOCKET**

	V24	RS232	DESCRIPTION	PARAMETERS
1. RxD	104	BB	RECEIVE DATA DCE > DTE	> +5.0V HI:LOGIC 0 < -5.0V LO:LOGIC 1
2. GND	101	AB	SIGNAL GROUND	
3. TxD	103	BA	TRANSMIT DATA DCE < DTE	> +2.4V HI:ACTIVE < +1.5V LO
4. SPK	---	--	SPEAKER 2 OUTPUT+	8 ohm 2 Vpp
5. CTS	106	CB	CLEAR TO SEND DCE > DTE	> +5.0V HI:ACTIVE < -5.0V LO
6. SPK	---	--	SPEAKER 2 OUTPUT-	8 ohm 2 Vpp
7. RTS	105	CA	REQUEST TO SEND DCE < DTE	> +2.4V HI:ACTIVE < +1.5V LO
8. +5V	---	--	POWER SUPPLY	5 Vdc 500 mA

Communication: RS-232 (DCE)  
300 ... 115200 bit/s  
7/8 data bits, 1/2 stop bits, 1 parity bit, 10/11 bit char length  
Software handshake, Hardware handshake

Mobi.Modem is a DCE (Data Communication Equipment). The EIA-RS232 interface is the interface for the application software providing the connection to DTE (Data Terminal Equipment). The EIA-RS232 interface is implemented as a 8 pole RJ45 modular socket. Circuit type SELV, max 15 m length, shielding not required. The customer application communicates with Mobi.Modem by means of AT cellular commands. AT commands manual is available for download at [www.contrive.mobi](http://www.contrive.mobi)

**EIA-RS232 VERSION**  
Mobi.Link cable 2505.00.01 is provided to convert RJ45 to standard DB9 connector.



**USB VERSION**  
Mobi.Link cable 2505.00.03 is provided to convert RJ45 to standard USB type A plug. Mobi.Modem can receive the power supply from this USB interface. A Personal Computer USB port can keep the unit alive if capable of sourcing 500 mA peak current. The unit can receive power supply both from terminal connector and RJ plug at same time.



**POWER SUPPLY AND COM PORT MUST MEET THE DEMANDS PLACED ON SELV (SAFETY EXTREMELY LOW VOLTAGE) CIRCUITS ACCORDING TO EN60950 / IEC950**

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## DEFAULT SETTINGS

It's possible to read current settings from the unit by means of AT&V command. A device with factory settings will return:

```
Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008
+CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1
+SPEAKER:1 +ECHO:0 &C:1 &D:2 %C:0
+IPR:115200 +ICF:3,4 +IFC:2,2
```

```
Q:0 Result codes NOT suppressed
V:1 Verbose mode
```

```
S0:000 Auto answer disabled
S2:043 Character for escape sequence (+)
S3:013 Command line termination character (Cr)
S4:010 Response formatting character (Lf)
S5:008 Command line editing character (BS)
```

```
+CR:0 Extended reports disabled
+CRC:0 Extended result codes disabled
+CMEE:0 Extended error indication disabled
+CBST:0,0,1 Bearer autobauding, async, transparent
+SPEAKER:1 Speaker output 2 (available at RJ45 connector)
+ECHO:0 Echo cancellation disabled
&C:1 Carrier detect indication
&D:2 Call released when DTR drop to OFF
%C:0 Data compression disabled (no V24 bis)
```

```
+IPR:115200 115200 baud
+ICF:3,4 8 data 1 stop No parity
+IFC:2,2 RTS / CTS (Hardware handshake)
```

Each setting can be modified with specific AT command.

This and many other settings related to active profile can be written to internal non volatile memory by means of command AT&W.

The command AT&F will restore the factory settings, overwriting any profile previously set with command AT&W.

## QUICK START

Connect a personal computer running a terminal emulation program or any other DTE to the serial interface providing the factory default communication settings:

- 115200 bit/s, 8 databits, 1 stop bit and no parity. (AT+IPR and AT+ICF commands to edit settings).

- RTS / CTS flowcontrol enabled (AT+IFC command to edit settings). Hard or soft flowcontrol MUST be enabled when using high speed rates.

Follow the steps below to get the unit up and running as quickly as possible:

- Insert a valid SIM card.
- Verify that the correct services are enabled. (e.g. incoming and outgoing DATA service, SMS service center, FAX service).
- For X-types devices make sure that the antenna is connected.
- Verify that the antenna is placed in the best position possible.
- Connect the battery, if any.
- Power on the unit and make sure that the PIN code of the SIM card is disabled either with the help of a mobile phone or with the command AT+CLCK. If the PIN code should be enabled make sure to enter the correct PIN code with the command AT+CPIN. After entering the PIN some SIM user data files are loaded into the device. Please be aware that it might take some time to read a large phonebook.
- Check that the the GSM operation led indicator [C] is flashing, this means that the unit has a connection to network and that it is registered.
- Verify the registration status by means of AT+CREG? command:  
+CREG:0,0 means not registered  
+CREG:0,1 means registered with Home Network  
+CREG:0,5 means registered roaming
- Check the received signal quality by means of AT+CSQ command: the value of the first parameter reported from the +CSQ command should be more than 10. +CSQ:99 means no signal available.
- Configure the unit with appropriate commands as needed in the specific application.

Commands always start with AT (which means ATtention) and finish with a <CR> character (carriage return).

Responses start and end with <CR><LF> (except for the ATV0 DCE response format) and the ATQ1 (result code suppression) commands.

- If command syntax is incorrect, the "ERROR" string is returned.
- If command syntax is correct but transmitted with wrong parameters, the +CME ERROR:<Err> or +CMS ERROR:<SmsErr> string is returned with adequate error codes if CMEE was previously set to 1. By default, CMEE is set to 0, thus the error message is only "ERROR".
- If the command line has been executed successfully, an "OK" string is returned.

In some cases, such "AT+CPIN?" or (unsolicited) incoming events, the product does not return the "OK" string as a response.

## ANTENNA

The external antenna must be connected to the RF interface, implemented as a 50 connector available in 2 different options:

- FME male coaxial jack at the end of a short RG178 cable stub exiting from the bottom left side of the unit.
- SMA female coaxial jack at top left of the unit.

The antenna must fulfil the requirements given below:

Frequency TX	880 to 915 MHz	1710 to 1785 MHz	824 to 849 MHz	1850 to 1910 MHz
Frequency RX	925 to 960 MHz	1805 to 1880 MHz	869 to 894 MHz	1930 to 1990 MHz
Impedance	50 ohms			
VSWR	RX max	1.5 : 1		
		TX max		1.5 : 1
Polarization	Linear			
Typical gain	0 dBi in one direction at least			

The gain must not exceed 8,4dBi @ 850MHz and 3,5dBi @ 1900MHz. We recommend a VSWR max of 1.5:1 although a VSWR max of 2:1 can be accepted without affecting performance and certification.

The DC impedance is floating but there is no problem when using antennas that present a short to ground.

## CUSTOM AT COMMANDS

Some custom AT commands are available for a simplified use of advanced features:

**AT#SMS=n, t** Send SMS  
n destination phone number  
t text to be sent (up to 160 characters)

*example* AT#SMS=+44123456,"Alarm"

**AT#CMSS=i, n** Send SMS from Mobi.Modem internal memory  
i memory index (1...99)  
n destination phone number (overrides stored one, if any)

*example* AT#CMSS=1  
AT#CMSS=2,+44123456

**AT#CMGW=i, n, t** Save SMS into Mobi.Modem internal memory  
i memory index (1...99)  
n destination phone number (optional)  
t text to be sent (up to 160 characters)

*example* AT#CMGW=1,+44123456,"Warning"  
AT#CMGW=44,,"Failure"

**AT#CMGR** Read all SMS from Mobi.Modem internal memory

**AT#APN=n, u, w** Set Internet Access Point Name  
n APN address  
u User name (optional, if required by APN)  
w Password (optional, if required by APN)

*example* AT#APN=myapn.com,myuser,mypass

**AT#APN?** Returns current APN settings

**AT#SMTP=n, p, u, w** Set Outgoing Mail Server Address  
n Server address  
p Server port (optional, default 25)  
u User name (optional, if required by Server)  
w Password (optional, if required by Server)

*example* AT#SMTP=mysmtp.com,587,mailuser,mailpass

**AT#SMTP?** Returns current SMTP settings

**AT#EMAIL=s, t, r** Send simple Email to destination  
s Sender's Email address  
t Text to be sent (into Subject line)  
r Recipients Email address (up to 10 separated by comma)

*example* AT#EMAIL=myemail.com,"Hello",email1.com,email2.com

Use Mobi.Voicer software utility to generate audio files from SMS text stored within the Mobi.Modem internal memory. Once text has been converted to speech it will be possible to use the following commands during a phone call:

**AT#PLAY=i, r** Play an audio file previously stored during a phone call  
i index of stored audio file (1...99, same as SMS index)  
r repeat (1...32000 times, 0 endless)

*example* AT#PLAY=2,0 (repeat continuously until hangup)

**AT#STOP** Stop current audio file

Any key pressed by the other party during a phone call will be reported issuing an unsolicited code:

**DTMF: k** k 0-9\*#

Use the following command to enable/disable custom commands:

**AT+WOPEN=1** Custom commands enabled (factory default)  
**AT+WOPEN=0** Custom commands disabled

## OPTIONAL BATTERY

This unit could be equipped with an high efficiency Lithium-Ion Polymer battery having a long life, that largely depends on temperature and frequency of main power failures, used in normal condition can last several years. Battery is already connected, you just need to provide power supply to operate Mobi.Key. The battery charging process will start.

### BATTERY SPECIFICATIONS

Voltage 3,7 V 4,2V FULL CHARGE  
Capacity > 320 mAh 1.26 Wh  
Temperature -20...60°C 0...45°C CHARGING

Battery status is reported at any time by the LED located near the connector:

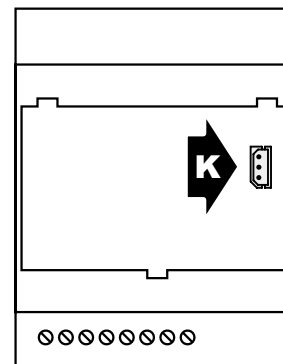
OFF	OFF	Charge OFF
RED	OFF	Charge in progress
OFF	GREEN	Charge completed
RED	GREEN	Bad or NO battery



Before a long period of inactivity switch off the unit to prevent deep discharge of the battery. This operation can be accomplished by issuing the command **AT+CPOF**

Battery should be disconnected only when the device is put out of service for very long time. This operation should be made by qualified personnel only:

- Disconnect all the wires from the terminal boards, disconnect the antenna.
- Remove the bottom cover to access the inside, and keep it in a safe place.
- Unplug battery connector from the socket [K] located on top side of the circuit.
- Replace the bottom cover to close the unit before to operate the device.



## VOICE / DATA / FAX / SMS

Voice features (GSM):  
[1] ■ Telephony, Emergency calls  
■ Full Rate, Enhanced Full Rate, Half Rate, Adaptive Multi Rate  
■ Echo cancellation and noise reduction  
■ Dual Tone Multi Frequency (DTMF) function  
■ Full duplex handsfree

SIM Interface: ■ 1.8V and 3V SIM  
■ U-SIM compatible

GSM Data features: ■ Circuit Switched Data Asynchronous transparent or non-transparent up to 14 400 bit/s  
■ Fax group 3 compatible

GPRS Data features: ■ Multislot Class 10  
■ Multislot Class 2 supported  
■ Coding scheme: CS1 to CS4  
■ PBCCH (Packet Broadcast Control Channel) support

EGPRS Data features: ■ Multislot Class 10  
■ Multislot Class 2 supported  
■ Coding scheme: MCS5 to MCS9  
■ PBCCH (Packet Broadcast Control Channel) support

SMS features: ■ SMS 160 characters text or PDU  
■ Point to point (MT/MO)  
■ Cell broadcast

GSM Supplementary Services: ■ Call Forwarding, Call Barring, Call Waiting, Call Hold  
■ Multiparty  
■ USSD (Unstructured Supplementary Services Data)

Internet services: ■ TCP  
■ UDP  
■ FTP  
■ HTTP  
■ POP3  
■ SMTP  
■ SNMP  
■ SSL  
■ MMS

[1] Speaker output routed to RJ45 connector  
Microphone input not implemented

## DECLARATION OF CONFORMITY

Radio Equipment Directive 2014/53/EU

**Company identification:** Manufacturer: Contrive, Srl  
Via Enrico Fermi 18 I-24040 Suisio

**Product identification:** Brand: Contrive  
Equipment name: Mobi.Modem  
Equipment type: GSM control for industrial and house equipment

**We declare on our sole responsibility, that the product described above, is in conformity with the essential requirements of the 2014/53/EU Directive.**

THE CONFORMITY WITH THE ESSENTIAL REQUIREMENTS OF THE EUROPEAN DIRECTIVE 1999/5/EC HAS BEEN VERIFIED AGAINST THE FOLLOWING STANDARDS:

- EN 60950-1:2006
- EN 60950-1 A11:2009
- EN 60950-1 A1:2010
- EN 60950-1 A12:2011
- EN 50385:2002
- EN 301 489-7 V1.3.1:2005-11
- EN 301 489-1 V1.9.2:2011-09
- EN 301 511 V9.0.2:2003-03EN 301 511 : v 9.0.2 : 2003

**NOTE** Class B equipment (domestic) emission level applied  
Class A equipment (industrial) immunity level applied

## THIS DEVICE COMPLIES WITH PART 15 OF FCC RULES

Contains FCC ID: N7NQ2687

OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:  
1 this device may not cause harmful interference, and  
2 this device must accept any interference received, including interference that may cause undesired operation.

Suisio, Italy May 15, 2017

Complete literature for this unit available here:  
[www.contrive.mobi/mobimodem](http://www.contrive.mobi/mobimodem)