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WIF-X2i
PRO,PRO+, ECO+, Cx1, Sx1
Remote telemetry and control Unit

Technical Manual

WIF-X2 Rev.11 04/05/2012

Wif Mx2i, a powerful and flexible platform ...

Powerful remote telemetry control unit with 66 channels gps, ready for Egnos technology, based on an Arm 7 cpu, 32 bits multithreaded operating system, quadband modem with class 10 Gprs, modular options, high reliability and high performances with optional 5 years of warranty for one of the best precuts of the world



Wif Mx2i family has many versions: Mx2 Eco+, Pro e Pro+; CX1 flex and pro; Sx1 basic and Advanced.

The Mx2 eco+ is the economic version of the family Wif-MX2i. Although it is an entry-level unit is equipped with an impressive list of features, including full support for GPRS, SMS, and GSM data transmission. The unit is built for applications of "Avl tracking" with its internal GPS receiver with 50 channels.

It has 5 Digital inputs, 4 digital output and 2 Analogue inputs with 1-wire connection and one RS232 port, it has an internal battery capacity but highly advanced power management allows her to remain in power saving mode for a long period while maintaining the connection to the GSM network and to "wake up" at a "business as GSM, for example, or a change of pulses to the digital inputs or the effect of a vibration sensor.

All Wif Mx2 have a GPS receiver with 66 channels and an internal battery LiIon with support for high capacity loads at low temperature, 5 digital inputs, 4 digital outputs, 2 analog inputs and an internal flash memory of 512 Kbyte file system FAT, readable by any PC.

The PRO is the most powerful family in addition to the GPS 66 channels and the internal battery is arranged to use an external memory sd, voice communications and is the best unit to access a wide range of accessories such as advanced display, camera, CANBUS-FMS, RS485, Sd memory, voice, bluetooth, wi-fi,

Windows ce with Sygic maps and Garmin nuvi navigators greatly expand the area of application of the product as display for messaging and navigation from remote to the vehicles!

PRO+ in addition to the features of the PRO has a more than 8 mega FLASH memory which allows a broader historical edge over time, for years of archives.

CX1 is the compact model with integrated RF option, houses with protection degree IP55, with accelerometer and the ability to store the historical relative.

Sx1, with Ip67 protection case, is the device for special usages with integrated antennas and big internal batteries for working long time without an external power supply.

Some of the actual applications:

Fleet control system;	Mobile tracking system Mobile;
Mobile data recorder;	Machineries remote controls
Alert systems/avl systems;	your custom application...

A 32bit processor:high performance and big memory capacity

- ARM7 a 32 bit processor from an industry leader
- Fast execution of native commands
- 2088 Kbyte of RAM (working memory)
- 2304 KByte of Flash memory for applications, database and voice messages (ready for upgrades to to 8MByte)
- 512 Kbyte of Dataflash to record data/parameters (ready for upgrades to to 8MByte)
- 8 KByte FRAM for rapid access to unlimited writing memories
- SD CARDS READERS in Mx2i pro with a FAT compatible file-system for easy sharing of files with a PC,. Capacity up to 2 GByte.

Specifications for the 66-channels SuperGPS receiver

MediaTek MT3339 Single Chip SuperGPS

- General: 66 Channels simultaneous operation
- A-GPS capable
- L1 frequency (1575.42MHz), C/A code
- Continuous tracking receiver
- Update Rate: NMEA @ 1 Hz
- Accuracy: Position <2.5m CEP
- DGPS/SBAS <2.5m CEP
- Sensitivity: Tracking/navigation -165 dBm
- Reacquisition -160 dBm
- Cold Start (Autonomous) -148 dBm
- (GPS chipset reference parameters)
- Time-To-First-Fix:8 Autonomous Operation in Standard Sensitivity Mode
- Reacquisition < 1 sec.
- Hot Start < 1 sec.
- Aided start < 3 sec.
- Warm start 32 sec.
- Cold start 32 sec.

Interface protocol: NMEA 0183 v3.0 with GGA, VTG, GLL, GSA, GSV and RMC

Gps Definitions:

Reacquisition: Time to get a fix when signal has been blocked for a short period of time.

Hot Start: The GPS has been powered down for less than 2 hours and the stored position and time are valid

Aided Start: The GPS has valid A-GPS information. A-GPS is currently unsupported in the standard firmware.

Warm Start: The GPS has been powered down for more than one hour, but has stored information about its current position and time

Cold Start: The GPS has been powered down for more than 48 hours or it has moved for more than 400km without be on.

Large number of standard features

- 5 digital inputs, 4 digital outputs with positive voltage (using MODBUS mx2 can manage 10, 20 Digital or analogue inputs and putputs)
- Serial Port (primary) RS232,
- 66 channels Gps
- Secondary serial Port RS232 with all control signals
- Integrated buzzer for audio alerts
- Three coloured LED: green, red and yellow
- Led show GSM state, energetic control, battery loadin etc.
- Two external DIPswitches and one reset little button to restart the device
- The RTCU MX2i pro unit contains a vibration sensor. It makes it possible through the power management to detect vibrations when for example the vehicle is moved. The sensitivity can be altered from within the firmwaremaking it suitable for various applications.

Advanced specs for Wif-Mx2i ECO+, PRO, PRO+

- Two analogue inputs
- CAN Controller 2.0B with hardware filter and mlti speeds support, J1939 and protocol Can Bus FMS for vehicles
- Cable accessories like "I-Button reader", temperature sensor, etc..
- Nokia headset compatible with amplifier and hands free voice kit
- WI-fi, bluetooth and vga camera accessories

State of The Art Communication Technology

- Quad Band (850/900/1800/1900 Mhz) GSM based on industry leading Texas Instruments Chipset solution
- Voice. Digitized (145 seconds) and headset
- SMS (Text and PDU)
- GPRS. Multislot class 10. Support for simultaneous Voice and GPRS (suspended)
- CSD (Datacall)
- Digitized voice and DTMF decoding. User spoken dictionary for implementation of voice response systems
- On-board high-performance 66 channel GPS-receiver with low-power consumption
- Full SBAS (EGNOS / WAAS / MSAS) support for enhanced GPS precision, galileo ready
- Prepared for A-GPS and DGPS
- Standard NMEA verbs can be output to any serial port or received by the VPL applicationComandi NMEA standard possono essere indirizzati a qualunque porta seriale per qualsiasi navigatore

Advanced Power Management

- _ On-board high-capacity (2000 mAh) Li-Ion battery pack with advanced charging circuit
- _ Supervision of supply voltage and supply type
- _ Several power-saving modes: Power-down, 'Wait for Event' and 5 Processor execution steps
- _ Wakeup from Power-down using Ignition (Digital input 5) and optional timer
- _ Wakeup from 'Wait for Event' using: Digital input, Vibration, Timeout, GSM-, CAN- or UART activity
- _ Real time clock with battery back-up

Highly Expandable

- _ RS485 Multidrop communication
- _ Li-Ion battery pack with support for low-temperature charging
- _ VGA CMOS Camera for intelligent remote surveillance
- _ High-sensitivity GPS-receiver capable of in-door tracking
- _ Bluetooth for wireless connection to Headset, PDA, PC, etc.
- _ Ethernet (cable) or Wi-Fi connection
- _ Mobile Data Terminal with backlit LCD and Keys as GUI
- _ Full integration to Garmin Navigation devices for advanced Fleet management / Messaging and Navigation applications.
- _ EGPRS (EDGE) available for bandwidth demanding applications
- External 10mAh batteries for trailers or containers usages
- External batteries for long duration up to 10mAh



WIF offers full integration with Garmin PNDs, for advanced Fleet Management, Messaging and Navigation applications!!

MDT: The Mobile Data Terminal (MDT-200) extends the RTCU MX2i eco+/pro/pro+, the RTCU DX4 pro or RTCU M11i Series with a flexible and easy to use user-interface solution with many advanced features, allowing all kinds of two-way messaging applications to be implemented.



Wif-Mx2i pro and Windows CE SMARTPHONE/PDA via Bluetooth

It is possible to use wif mx2i pro with Smartphone or pda via Bluetooth or serial rs232 cables. . Wif worked with Samsung i600 that has a complete qwerty keyboard see <http://it.samsungmobile.com/wcms/products/phones/phonedata/features/IT-SGH-I600.jsp>



The pda has the same functionalities of garmin navigator plus other windows functions and easier portabilità.

DIGITAL TACHOGRAPH

Wif-mx2i can read tachograph data from Actia systems, see <http://www.actiaitalia.com/IT/tachigrafo%20digitale.htm>

Wif Mx2i pro hands free kit voice

Wif Mx2i pro could use voice with bluetooth hands free voice kit or with cable ones.

I-BUTTON/TRASPONDER



Wif Mx2i can use ID Button can be read by a iButton reader connected to a RTCU M11/M11i series, MX2i pro/eco+ or RTCU A9i for easy and secure identification of a person/item identified with a unique ID button. This can be used for numerous applications: driver identification, turning alarm on/off, usage registration etc. Vedi <http://www.maxim-ic.com/products/ibutton/ibuttons/>

Wif mx2i can use trasponder for security. See <http://www.bestidea.it/eng/pages/prodotti/000000.php>





Rear view of Mx2i pro



Front view of Mx2i pro

Specifications for the RTCU MX2i pro / pro+

Power supply	Min	Typ	Max		
Operating Voltage	8	-	36	VDC	Protected against wrong polarity.
On-board Li-Ion Battery Pack		1.8	2	Ah	Optional Low-temperature pack available.
Unit Active		45		mA	GSM idle @ -63 dBm
Unit Active with GSM On		55		mA	
Unit Active with GPS On		60		mA	
Unit Active with GSM/GPS On		70		mA	GSM idle @ -63 dBm
Unit Active while Charging		650		mA	
Unit in Power-down		0.4		mA	Restart on: DI 5 and RTC
Unit in "Wait for Event"		0.4		mA	Resume on: DI, Vibration, RTC
Unit in "Wait for Event"		10		mA	Resume on: CAN
Unit in "Wait for Event"		8		mA	Resume on: RS232
Unit in "Wait for Event", GSM On		15		mA	Resume on: GSM
<i>Typical measurements @ 12 VDC Supply.</i>					
Digital inputs		Min	Typ	Max	
	Logic "High"	8	12	40	VDC
	Logic "Low"	-5	-	3	VDC
All inputs are protected against transients and low-pass filtered.					
Digital outputs (Solid state)		Min		Max	
	-	-	-	36	VDC
	-	-	-	1.5	A
Protected against: Short circuit, ESD and inductive (Relay) kickback up to 20mH.					
Analog inputs		Min		Max	
	0	-	-	+10	VDC
Resolution is 10 bits. All inputs are protected against transients and low-pass filtered.					
Storage temperature:	-30	-	+65	°C	External interfaces: • TYCO "Mate'n'Lock" connector for: • RS232 port 1 (service port) • Power, Digital I/O, Analog Input • CAN, RS485 • RJ45 for RS232 port 2 (EIA-561 compliant) • Three bi-color LED and one yellow status LED • Two DIP-Switches • SMA-Female connector for GSM antenna • SMB-Male for active 3 Volt GPS antenna • Standard 3 Volt SIM-Card reader (external access) • Nokia compatible Micro-Jack headset connector All interfaces are externally accessible
Operating temperature (According to GSM 11.10 specification)	-25	-	+55	°C	
Restricted operation (deviations from the GSM specification may occur)	-30	-	+65	°C	
Charging Temperature (Low temperature charging available)	0	-	+45	°C	
Humidity (non condensing)	5	-	90	%	
Weight	0.300			Kg	
External dimensions	W 97 x H 35 x D 132 mm				without SMA and SMB connectors
Ingress Protection (IP)	IP30 (SIM/SD/Connectors in use)				Aluminum enclosure with
Approvals	EN-61000-6-3;2001 Emission EN-61000-6-2;2001 Immunity			 10R-024899  034899 	

Technical data subject to change

The RTCU SX1 series is stand-alone tracking, monitoring and data collection device designed for applications, which require extremely long operating time without access to external power. Based on the X32 generation of RTCU products the SX1 series introduces zero-power saving mode reducing the power consumption in the deepest hibernation mode to virtually nothing. This state-of-the-art technology allows the unit to operate as long as 10 years purely stand-alone with no external power!



The RTCU SX1 is a compact tracking, monitoring and data collection device especially designed for stand-alone extremely long operating time in harsh environments. The product is fully integrated in an IP66 ingress-protected ruggedized plastic box, that can withstand years of operation. The zero-power saving mode allows the unit to enter power saving mode - waking up on the on-board 3D accelerometer, digital input change or after a certain time period – and to stay in this mode virtually forever only limited by the battery technology used!


The RTCU SX1 series is available in versions for standard GSM or railroad based GSM-R for advanced and reliable asset tracking in a wide range of application segments.

Features of the RTCU SX1 series:

- ☐ Based on the X32 generation platform sharing the same features and code compatibility.
- ☐ Advanced zero-power saving mode with virtually no power consumption.
- ☐ Wake-up from zero-power mode: accelerometer, digital input, time, ext. power and USB.
- ☐ Integrated power consumption measurement for management and statistical purposes.
- ☐ Quad-band GSM with support for M2M chip.
- ☐ GSM-R with support for M2M chip.
- ☐ SuperGPS chipset with world-class performance and 3D fix wake-up capability.
- ☐ Internal or external GSM quad-band antenna / GPS antenna.
- ☐ Medium range ISM RF Transceiver (868 Mhz) with internal or external antenna.
- ☐ Ruggedized IP66 plastic encapsulation with mounting flange. 126 mm x 174 mm.

- ☐ Outside visible system LED and user LED. Internal DIP-switch.
- ☐ Several power-configurations supported:
- ☐ 58 Ah (nominel) non-rechargeable battery. Height: 56 mm.
- ☐ 24 Ah (nominel) non-rechargeable battery. Height: 43 mm.
- ☐ 10 Ah (nominel) rechargeable battery and external power. Height: 43 mm.
- ☐ Dedicated high-speed USB programming port.
- ☐ One RS232 Serial ports
- ☐ Micro SD-CARD reader with FAT32 file-system and internal flashdrive.
- ☐ Optional expanded flash memory (XF8)
- ☐ 2 digital inputs, 2 digital outputs and 2 analog inputs (0..10V)
- ☐ 1-wire bus.

Dx4 eco
Scheda Tecnica WIF Dx4 Eco

Alimentazione	Min	Typ	Max			
Tensione di utilizzo	8	-	36	VDC	Protezione contro polarità errata	
Batteria LI-Ion a bordo (non applicabile MX2 Eco)		1.8	2	Ah	Possibilità di batteria low-temperature opzionale	
Unità Attiva		55		mA		
Unità Attiva con GSM on		70		mA	GSM idle@ -63 dBm	
Gsm					quadband	
Gprs					Class B, Multislot 10	
Unità Attiva durante la ricarica		580		mA	(non applicabile MX2 Eco)	
Unità spenta		0.6		mA	Risveglio da :DI 5 e RTC	
Unità in “attesa di evento”		0.6		mA	Risveglio da: ID, Vibrazione, RTC	
Unità in “attesa di evento”		13		mA	Risveglio da: CAN (n.a. MX2Eco)	
Unità in “attesa di evento”		8		mA	Risveglio da: RS232	
Unità in “attesa di evento”, GSM on		17		mA	Risveglio da: GSM	
Ingressi Digitali Logic“High”	6	12	40	VDC	Tutti gli ingressi sono protetti contro sovratensioni e filtrati passa basso	
Logic “Low”	-5	-	3	VDC		
Uscite Digitali (Solid state)	-	-	36	VDC		
	-	-	1.5	Amp		
Ingressi analogici	0	-	+10 20	VDC mA	Risoluzione a 10 bits. Tutti gli ingressi sono protetti contro sovratensioni e filtrati passa basso.	
Temperatura di stoccaggio	-30	-	+65	°C	<div>• Power, I/U Digitali, Ingressi analogici</div> <div>• CAN, RS 485</div> <div>➤ RJ45 for RS232 port 2 (EIA-561 compliant)</div> <div>➤ Tre LED bi-colore e un LED arancione di stato</div> <div>➤ Due DIP-Switches</div> <div>➤ connettore SMA-femmina per antenna GSM</div> <div>➤ Lettore standard 3 Volt per SIM-Card (accesso esterno)</div> <div>Tutte le interfacce sono accessibili esternamente</div>	
Temperatura in funzionamento (secondo le specifiche GSM 11.10)	-25	-	+55	°C		
Operazioni a rischio	-30	-	+65	°C		
Temperature per la ricarica (esclusa MX2 Eco)	-10	-	+45	°C		
Umidità	5	-	90	%		
Peso						
DX4 ECO		0.330		Kg		
Dimensioni esterne Senza connettori SMA e SMB	L157	H86 IP20 Kg 0,43	P58	mm		
Ingress Protection (IP)	IP40 (SIM /SD-CARD in use) ECO/ECO+			Involucro di alluminio 9 Module M36 DIN-rail enclosure		
	IP30 (SIM /SD-CARD in use) PRO/PRO+					
Certificazioni	EN-61000-6-3;2001 EMISSION					
	EN-61000-6-2;2001 IMMUNITY					
Omologazioni: E1: 10R-024899 - e1: 034899 Direttiva UE EMC 2004/108/EU						



3 - Support

Call +39 **0432.730070** or send an e-mail to ***supporto@wif.it*** for a direct assistance during working days from 9:00-17:30 CET time.

4 - Warranty

Wif-x devices have normal warranty of 2 years or the customers can pay an extended warranty of 3, 4 or 5 years.

1.INSTALLATION

1.1 Warning s for installer people

Read carefully the warnings inside this document please.

The dealer assumes no responsibility for failure or malfunction of the system, equipment or the electrical system of the vehicle due to poor installation or exceeding the specified characteristics. The retailer can not be held liable for any damages arising from improper use. For any servicing only to a service facility authorized by the manufacturer.

1.2 SIM GSM

The devices require a GSM SIM to work properly: usually the sim is already present and activated.

Warning: if the sim was not preinstalled, you must call the central service number +39 0432 730070 or by mail to: supporto@wif.it for instructions about the type of SIM purchase.
The SIM must be unlocked by the PIN code or must be used, by a GSM phone, without being prompted for the PIN code switch.

The professional WIF MX2 contains a standard GSM SIM card reader located on the front plate easily accessible.

Insert the SIM card into the reader oriented as shown in the photo at right.

Push the card into the reader until you hear a slight step: the card will now remain in place. You may need to use a small tool or pencil.



For the purposes of protection and security you need to slide the block protection mechanism before the SIM card to prevent accidental removal. Use this safety lock.

To remove the card slide the lock to its unlocked position, push the card slightly, and drop quickly, the spring-loaded device eject now.

If the SIM card is removed during the operation unit of course lose the connection to the GSM network.

When a SIM card is inserted into the unit will automatically refresh approximately 10 seconds after insertion and will begin operating normally.

1.3 Antennas and gps device placement

Wif Mx2 devices should be installed inside vehicles: they are not fitted for outdoor usage.

Warning! The device MUST be installed far from electric engine, heat sources, dust and it should be fixed to the chassises of the vehicles to avoid movement of the device itself.

The gps antennas MUST have the sky over without metallic obstalcesto avoid interference and signals losses.

The best antenna solution is shark profile antennas or magnetique used outside the vehicle, best on the roof of the vehicles
The standard antennas are for internal usage only.

1.4 Wif MX2 colours of the cables

The Wif MX2 devices need external power 9- 30 volt. There is a cable with 3 wires for power with coulored wires: Red wire positive, black ground and white wire the ignition.

Power: 3 wires		Range 9-30 Vdc
Red	Positive power supply	Under fusible of 1,5A
Black	Ground	
White	Ignition –	Under protection fusible of da 500mA

Digital inputs with positive values only: Cable with 4 wires; Range 10-30 Vdc; maximum 600mA		
Red	Digital input n° 1	Trasponder or antitheft
Green	Digital input n° 2	Doors or Panic Button
Yellow	Digital input n° 3	Engine starts to calculate engine working hours
Blue	Digital input n° 4	Back door or shock sensor or lift activation sensor

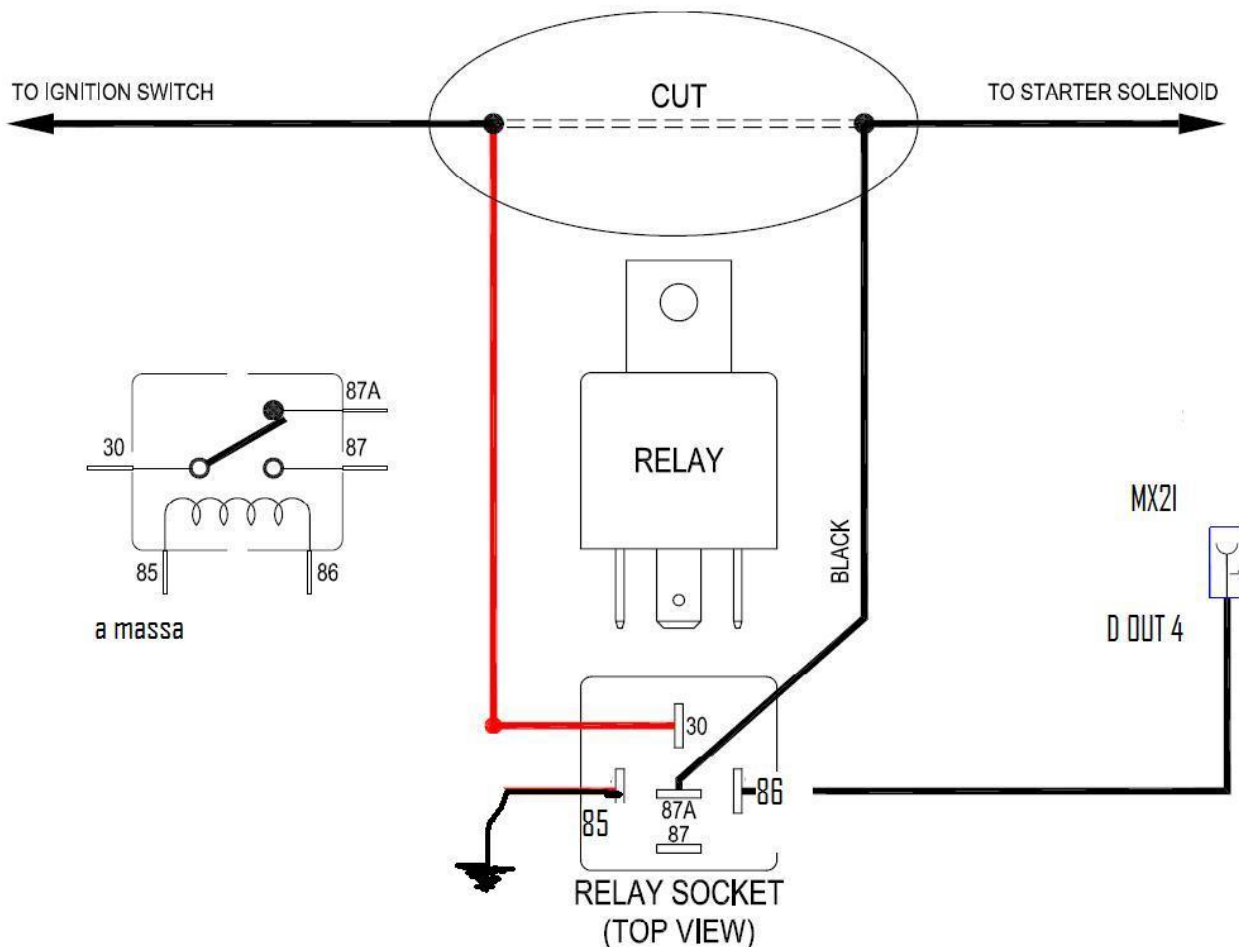
Analog inputs		8 wires cable; Range 0 to 10 Vdc - 800mA
Couple WHITE-BLACK White positive, Black ground	ANALOG INPUT 1	PANIC BUTTON
Couple BLUE-BROWN BLUE positive, Brown ground	ANALOG INPUT 2	FUEL LEVEL VOLTAGE

Digital outputs		8 wires cable; Range max 30 Vdc - 800mA
Violet	Output 4	Engine startup Lock
Yellow	Output 1	Power to speakers or other
Green	Output 2	Buzzer or Siren
Red	Output 3	Led for trasponder or I-Button

1.6 Lock engine startup installation

The block engine start is to use a relay with internal protection diode (see for example 1N4007 or COBO AV180011 url: http://www.arielbs.com/browse_cat_e.asp?ID=014&Muovi=47) to connect to Digital output 4 of Mx2 pro .

Output 4 is the default for starting blocks, in which case the exit 4 (purple wire) is connected to contact 86 (in COBO) using two outputs: the 87 closes the circuit if energized (30) while the 87A is closed when the 86 is energized, see image:



In this way when you turn on the output 4 relay switches to the positive value (12 or 24v) and the relay driver locking the starter or the on / off of electric motors.

Using specialized alarms as the Patrol line HPS795/55 you can also have the engine block (fuel pump), sirens and other accessories.

1.7 Diagnostic

Wif Mx2 device LEDS give you A diagnostic :



LED 1+2:

- Red light means Good Gps position;
- Green light means Gprs connection without a valid gps;
- Orange Light means all is ok: gps and gprs connection to the server.

SYSTEM LED 1+ 2:

- Flashing green light means good gsm connection;
- Orange light means gprs ok with operator connection.

LED 3+4:

- Green light means gsm ok.

SYSTEM LED 3:

- Little flash light when the device is in hibernation state every few seconds.

2 - Installation TEST

After installation, to test the equipment on board, call center operators to communicate to the number 0039.0432.730070 and serial number plate of the vehicle apparatus installed. The test consists of a central control device and still half on, with possible testing of the sensors connected, and a test of a brief tour of the means of verification of the system fully operational. Only testing will ensure proper installation of equipment.

Please note that without testing the provider does not guarantee the operation of the system.

The system requires 5 days after the test is in control for the improvement of the service by the plant.

2.1 Installation and testing document

The installer at the end of these tests shall send the Form of Acceptance with the details by fax to +39.02.700508732 or e-mail to supporto@wif.it.

The installer should take a copy of this document and preferably, if the installer has a digital camera, photographs of the apparatus installed in the case of vehicles with drivers issues.

2.2 Warnings for the installers

Carefully read the warnings contained in the following document as they provide important information on safe use and installation.

The vendor assumes all responsibility for the failure or malfunction of the system, equipment or electrical system of the vehicle due to poor installation or exceeded specified characteristics. The dealer can not be held responsible for any damage resulting from improper use.

For repairs apply only to a service center authorized by the manufacturer.

