- Specialized module for vehicle tracking and monitoring
- Integral, 50 channels GPS module with highest sensitivity (-162 dBm) in SuperSense® technology
- Integral, 4-band, GSM modem
- Binary inputs and outputs
- Efficient fuel measuring
- Driver identification
- Large data recorder 30k records
- 2 serial ports (one RS485*)
- 3 axis accelerometer
- Audio input and output*

optional

ML-231 is a specialized telemetry module dedicated to monitor status and location of vehicles. Module's design is based on latest GPS/GSM technologies securing precision of localization and GSM signal propagation. The design complies with automotive industry design standards.

Resources
- 5 binary inputs including:
    - dedicated ignition ON detection
    - dedicated alarm detection input
    - 2 general purpose binary inputs (with counting and scaling function)
    - 1 ground sensitive binary input
- 2 binary outputs
- 2 voltage analogue inputs
    - frequency measurement
    - average value computing
    - max value detection
    - differential measurement
    - voltage measuring with alarm thresholds
    - precise fuel level measuring
- Main supply input with voltage monitoring
- Auxiliary supply with voltage monitoring
- 2 1-Wire inputs (Dallas iButton) for driver identification and temperature measuring
- Audio input & output (for loudspeaker and microphone)*

Functionality
- Cyclical position calculation on GPS signal base
- Monitoring of analogue and binary inputs and outputs
- Monitoring of fuel level and rapid level falls

- Speed monitoring/speeding/stopping
- Binary inputs signal filtration eliminates signal interference
- Additive or subtractive pulse counting on I3 and I4 inputs allows variable flow meter connections.
- Controlling binary outputs according to internal logic and remote commands
- Detection of missing GPS signal
- Reporting according to defined distance and time criteria as well as driving direction change
- Transmission of information as a result of triggering predefined event
- Logging of data in case of missing GSM communication
- Transmission modes
    - GPRS – packet transmission
    - SMS
    - e-mail
- Configurable transmission in home network and in roaming
- Dynamic SMS composing allowing transmission of current measurements values
- Configurable SMS limits
- Local or remote configuration via GPRS
- Configurable access permissions – list of authorized IP addresses and phone numbers
- Monitoring of main and auxiliary supply voltage
- Diagnostic LED facilitating module's start
- Detachable connector and antenna sockets
- Dedicated local connection socket for PC for configuration and verification of parameters.
- 3-axis acceleration measurement
    - motion detection
    - collision detection (with 60 seconds log*)

optional

WARRANTY 3 YEARS

MIM

SMS

e-mail

GPS

5DI/2DO

2AI

RS-485 option

ML-231

ML-231

General

Dimensions (length x width x height)	112 x 65 x 23,5 mm
Weight	110 g
Mounting mode	Velcro/Strap
Operating temperature	-20 do +55 °C
Protection class	IP40

GSM/GPRS Modem

Modem type	LEON G100
GSM	Quad band (850/900/1800/1900)
GPRS class	10
Antenna	50 Ω SMA socket

GPS Receiver

Receiver type	μblox NEO-6
Sensitivity	-162 dBm Super Sense® Indoor GPS
Channel number	50
Antenna	Active 3V MCX connector

Power supply

DC voltage	9 – 30 V		
	Max	Idle	Power Save
Input current (mA) (for 13,8 V)	200	35	<10
Input current (mA) (for 27 V)	100	20	<10

Inputs I1 – I5

Input voltage range	0 – 30 VDC
Input resistance	22 kΩ
Input voltage ON (1)	> 7 V
Input voltage OFF (0)	< 2,5 V
Frequency range in counter mode (I3, I4)	50 Hz
Minimum pulse width "1"	20 ms

Output 1, 2

Recommended average current for single output	250 mA
Voltage drop at 250mA	0,3 V
OFF current	20 μA
Application	Immobilizer, parking mode, LED/BUZZER signalling, others

Input 1-Wire 1, 2

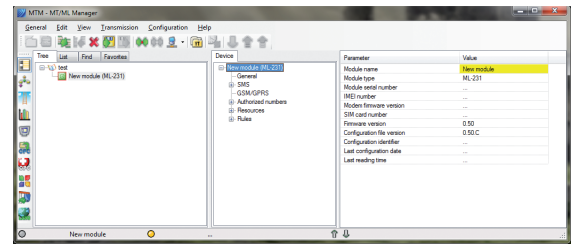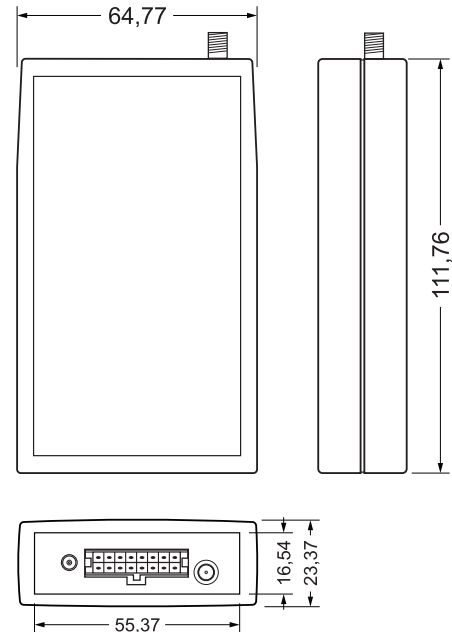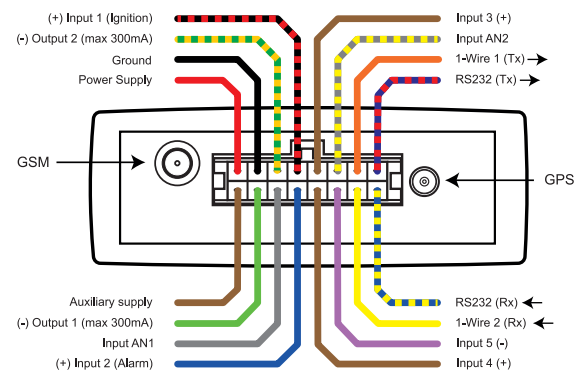|	
Standard	Dallas I-Button
Application	driver authorization temperature measurement

Analogue Inputs

Measurment range	0 – 10 V*
Input Resistance	200 kΩ
A / D converter	12 bits

*with the possibility to increase the scope

Serial ports

Standard	RS-TTL (3 V)
Optional	RS-485
Application	External expansion modules (CAN, RFID)

Configuration program

Drawings and dimensions *(all dimensions in milimeters)*

64,77

111,76

16,54

23,37

55,37

Connections

(+) Input 1 (Ignition)	Input 3 (+)
(-) Output 2 (max 300mA)	Input AN2
Ground	1-Wire 1 (Tx) →
Power Supply	RS232 (Tx) →

GSM

GPS

Auxiliary supply	RS232 (Rx) ←
(-) Output 1 (max 300mA)	1-Wire 2 (Rx) ←
Input AN1	Input 5 (-)
(+) Input 2 (Alarm)	Input 4 (+)

Supplementary information:

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