



Mobile Engine

ME301

Technical Manual

Version 1.4, April 2009



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Introduction

This document contains the installation guide for the GSM/GPS product type series ME 301 Mobile Engine units. This manual is intended for use by system integrators, service providers and application developers (collectively, “Resellers”). It is not intended for end-users of the mobile engine ME301. Any end-user documentation is to be prepared and furnished by the Resellers.

This manual covers the ME301 with 54.4 and later firmware and operating on 850 MHz, 900 MHz, 1800 MHz and 1900 MHz Global System for Mobile communication (GSM) networks. Data and Event Reporting support is by Short Message Service (SMS), General Packet Radio Service (GPRS), or both.

This manual describes how to set up, configure, install, operate, and troubleshoot the product. Even if you have used other GSM or Global Positioning System (GPS) products before, M-Tec recommends that you spend some time reading this manual to learn about the special features of this product.

M-Tec assumes that you are familiar with Microsoft Windows (2000, XP), and know how to use a mouse, select options from menus and dialogs, make selections from lists, and refer to online help.

This manual is available in portable document format (PDF) from the following web site: www.trackunit.com. Alternatively the latest version of this manual can also be downloaded from the factory website:

<http://www.m-tec.dk>

Related Information

The Trackunit Pro web site is found at www.trackunit.com. This site is dedicated to the fleet management system from M-tec A/S called Trackunit Pro. ME301 devices are integrated to Trackunit Pro but can also be used together with third part system providers.

Delivered standard content

The delivered standard package content includes the following items:

1 x GSM/GPS-unit of the model type ME301

1 x Mounting cradle

1 x Li-ion Battery (May already be mounted inside the ME301 unit)

In case the unit is delivered with SIM card from the factory, then the GSM number will be indicated on the delivery note as well as on the package itself.

NOTE: In case the SIM card is delivered from factory it is mounted inside the ME301 unit.

Ready-to-Use, No Custom Programming Required

Simply insert an activated SIM card and battery and the unit is ready to start reporting when connected to a 12V/24V DC power supply. In its default configuration, reports are sent nominally at 15-minute intervals or faster whenever there is motion.

Upon powering up, the device will self-initialize anywhere in the world and start transmitting if an authorized GSM network is available. While a basic understanding of the different ME301 operational states is helpful, configuring the ME301 unit does not require a highly skilled software programmer or technician.

Cost-effective, Universally Available Communications

The ME301 unit takes advantage of the near universal availability of GSM SMS text messaging while also leveraging cost-effective GPRS data rate plans. Typical SMS plans offer very extensive inter-network roaming capabilities, both within a host country and internationally.

SMS plans also tend to be too pricey for applications requiring more than a few reports per day. GPRS data plans, on the other hand, typically allow for lower recurring communication costs although GPRS coverage and roaming can be restricted in some areas.

The ME301 unit takes advantage of both technologies by automatically selecting GPRS wherever such service is available, while relying upon SMS text messages for configuration purpose only. This helps minimize recurring communication costs while allowing the greatest coverage possible.

Installing the unit

Practical installation advice

- It is very important to be careful when installing the unit, as incorrect installation will reduce the quality of the GPS position reports (Ex. could be a jump in position or showing speed while parking) or in the worst case scenario will prevent the unit performing any position reporting at all.

The unit must **NOT** be installed beneath metal plates or inside closed metal compartments. Incorrect installation will also reduce the standby time of the battery inside the unit.

- The unit must be mounted either horizontally or vertically (side ways) using either screws or strips. The unit **must not** be installed with the interface/supply cable hanging down, as this definitely will reduce the sensitivity of the GPS antenna. Optimize the placement of the unit to increase the aerial view (Through windows etc.) as much as possible. For hiding the unit, make sure it is only mounted beneath plastic parts or similar parts (wood), but not beneath metal parts.
- To reduce hum and noise in the FM radio it is recommended to place the unit at a minimum distance of 20 inches (50 cm) from the radio or the loudspeakers.

Connections

The connections depend on the type of vehicles / machines etc. in which the GSM/GPS unit is to be installed. In the schematic below the possible connections are listed for the ME301-1 device (Generic model).

The connections may differ for other variants of the ME301 device. Please contact your nearest sales office, distributor or "Reseller" for further information about the availability of other variants in your area.

No.	Wire (color code)	ME301-1 function
1	Red	Supply voltage +12V / +24V
2	White	Digital input 1
3	Brown	Digital input 2
4	Pink	Digital input 4
5	Yellow	Digital output 1
6	Blue	Common ground

Power supply

The unit **must** be connected to either +12V or +24V battery voltage through a preinstalled quick fuse of 1 Amp. The use of a fused supply wire is important for not damaging the wires related to the unit in case of a short circuit etc.

Digital inputs

The activation of a digital input requires a minimum high level voltage of 8V.

Digital output

The digital output has the type indication "LO-side switch", that connects the output to 0V "ground", when the output is active. The current that flows at the output has to be delivered from an external DC supply voltage. The maximum pull current at the output is 200mA and the voltage from the external supply voltage must not exceed 40V DC.

The output is protected against short circuits, overload and is also protected against over voltage. For further information about connection possibilities of the digital output, see chapters about "Installation of the ME301 in machinery" or "

Installation of ME301 in **vehicles**" in this manual.

Installation of the ME301 in machinery

In this section possible installation proposals are given. The installation proposals are listed as examples and can be used as a guide for inspiration for an actual installation.

Standard installation of ME301 for registering operating hours:

For a standard installation in machines where the unit should register the number of operating hours use the connections as follows:

No.	Wire (color code)	Connection	Description
1	Red	Power	Connect to a fixed DC supply through a preinstalled quick fuse of 1 Amp.
2	Blue	Ground	
3	White	Digital input 1	Connect to the operating hours counter. (Min. 8V DC voltage at the input)
4	Brown	Digital input 2	Connect to the ignition signal (Min. 8V DC voltage at the input)
5	Pink	Digital input 4	Possible to connect to an external sensor for detecting a critical running mode or an alarm (Min. 8V DC voltage at input)
6	Yellow	Digital output 1	Can be used to disconnect the “start relay” in the vehicle using a relay, see example in “ Installation of the digital output ”. (Max. Load 200 mA)

Installing the ME301 as to surpass the main switch on the machine:

In case the main switch on the machine will break the negative wire (Ground wire), the inputs may register a voltage level and start counting operating hours. To avoid this situation the digital input 4 (Pink wire) should be connected to the chassis/ground on the machine. Then send the following SMS to the unit (phone number) to activate the filtering:

Function	Send SMS	Return-SMS from the unit
Activate filter function on inputs.	<i>MT INFILT ON</i>	<i>MTC ACK (SERIAL No.) INFILT ON</i>

NOTE: Enabling the filtering function will disable the use of the alarm function on digital input 4 as listed in the standard installation proposal above.

NOTE: It is recommended always to connect digital input 2 to the ignition signal of the vehicles as this decreases the power consumption and prolongs the standby time of the battery.

NOTE: For the “Send SMS” it is of no importance if small or capital letters are used in the command string, or a mixture hereof.

Installation of ME301 in vehicles

The standard installation for vehicles, where the unit should register operating hours based on the power output of the vehicles, the following connections are used:

No.	Wire (color code)	Connection	Description
1	Red	Power supply	Connect to a fixed DC supply through a preinstalled quick fuse of 1 Amp.
2	Blue	Ground	
3	White	Digital input 1	Connect to the power output of the vehicle. (Min. 8V DC voltage at the input)
4	Brown	Digital input 2	Connect to the ignition signal (Min. 8V DC voltage at the input)
5	Pink	Digital input 4	Possible to connect to an external sensor for detecting a critical running mode or an alarm (Min. 8V DC voltage at the input)
6	Yellow	Digital output 1	Can be used to disconnect the “start relay” in the vehicle using a relay, see example in “ Installation of the digital output ”. (Max. Load 200 mA)

NOTE: It is recommended always to connect digital input 2 to the ignition signal of the vehicle as this decreases the power consumption and prolongs the standby time of the battery.

Functionality check

Light diode

The ME301 is fitted with a light diode that has the following status indications:

Light diode mode	Status indication
A constant green light shortly interrupted by a red blink:	The unit is attached to the GSM network and the GPS is navigating – Everything is OK.
No light:	The unit is not connected to a power supply
Constant red light:	The unit is powered up, but is not yet attached to the GSM network
Short red blink:	The unit is powered up and it is attached to the GSM network
Constant green light:	The unit is navigating (GPS-satellite position fix)



Status SMS Commands

In order to control if the installation of the ME301 unit has been done correctly, it is possible to send one or more check SMS messages to the GSM phone number allocated to the unit.

Please wait 1 minute after applying the power to the unit before attempting to send any SMS messages to the unit.

An overview of the SMS message commands for functionality check is given below:

Check	Send SMS	Return SMS from unit
<ul style="list-style-type: none"> Is the unit powered up? Does the GPS receiver have sufficient reception conditions? Is the GSM signal coverage sufficient? <p>NOTE: It is best to perform this check under outdoor conditions as any buildings/garage would reduce signal quality.</p>	<p><i>MT SIGNAL</i></p>	<p><i>MTC ACK (SERIAL No.) SIGNAL: GSM=22, SAT=8, SN=44</i></p> <p>"GSM" is a measure for the quality of the GSM coverage. The value should be at least 10. Maximum value for GSM coverage is 31.</p> <p>"SAT" is a measure for the number of GPS satellites visible to the GPS receiver. Operational minimum is 3 and the best operation is obtained from 6 and up.</p> <p>"SN" is a measure for the GPS-signal strength. Should be larger than 35.</p>
<ul style="list-style-type: none"> Are the digital inputs mounted correctly <p>NOTE: This command can be send to the unit under various operational conditions like: Machine running, ignition only or off.</p>	<p><i>MT STAT</i></p>	<p><i>MTC ACK (SERIAL No.) INPUT STATUS: INPUT1 LOW, INPUT2 LOW, INPUT4 LOW, CHARGE VOLTAGE ON</i></p> <p>NOTE: An input is HIGH if there is more than 8V on the input – otherwise it would be LOW</p>

NOTE: For the "Send SMS" it is of no importance if small or capital letters are used in the command string, or a mixture hereof.

Troubleshooting

In the following various error situations are described along with some possible solutions.

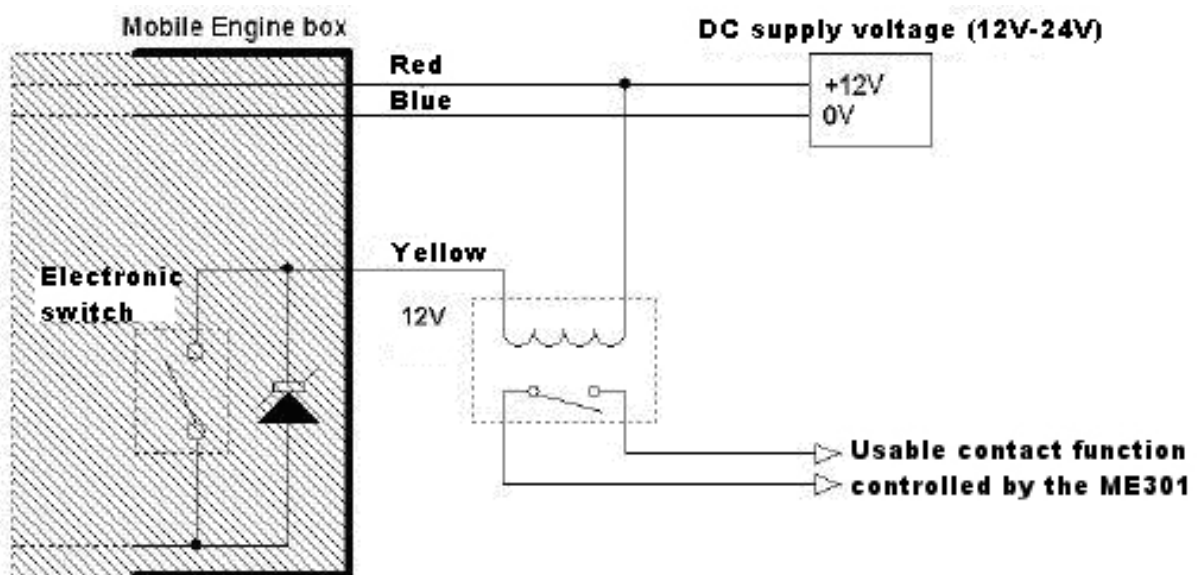
Error code	Error description	Possible solutions
F1	The unit does not answer the SMS command send to it.	<ul style="list-style-type: none"> ◆ Verify if the SMS messages are send to the correct GSM phone number. ◆ Check light diode status; See the “Functionality check” chapter in this manual. ◆ If the ME301 unit has been delivered with the SIM card mounted. Contact M-Tec support. <ul style="list-style-type: none"> ○ Or contact the mobile operator to verify if there is any problem with the SIM card. ◆ Verify if the SIM card is correctly mounted in the unit.
F2	The light diode in the unit is off, thus no power on the unit.	<ul style="list-style-type: none"> ◆ Check if the installation is performed correctly according to the guidelines of this manual.
F3	The light diode is constant red, thus the unit is not attached to the GSM network	<ul style="list-style-type: none"> ◆ If the ME301 unit has been delivered with the SIM card mounted. Contact M-Tec support. <ul style="list-style-type: none"> ○ Or contact the mobile operator to verify if there is any problem with the SIM card. ◆ Verify if the SIM card is correctly mounted in the unit. ◆ Verify if the PIN code has been disabled from the SIM card before it was inserted in the unit
F4	The unit send reply messages but there is no GPS signal	<ul style="list-style-type: none"> ◆ Verify if the unit is mounted according to the instructions laid out in this manual with respect to the aerial view; see “Installing the unit” chapter. ◆ If the machine/vehicles are located inside a building, please move the machine/vehicle outside a try again.

Installation of the digital output

According to the E1 certificate of the ME301 unit, it is prohibited under any circumstances to use this output to control any equipment that may influence the safety of the construction machinery and earth moving machines/vehicle operation and driving. The output must only be used to control comfort equipment.

The example below shows a 12V relay function with a 12V DC supply voltage. It is also possible to use a 24V relay with a 24V DC supply voltage. The current consumption of the relay must not exceed 200 mA (DC current) and the relay contacts must be specified to withstand the load that needs to be controlled.

NOTE: The output can only handle DC and **not** AC voltage. It is necessary to only use a DC power supply for the relay.



Important! The power supply connected to the ME301 GSM/GPS unit and the supply voltage for the relay mounted on the digital output must have a common ground connection.

One application example for the “Usable contact function controlled by the ME301” signals shown in the figure above could be a “Start Relay”, blocking function, for preventing unauthorized use of the moving machinery and construction machine or vehicle outside normal working hours etc.

SMS commands for output control

Function	Send SMS	Return SMS	Description
Time controlled activation of the output	MT OUT1=120	MTC ACK (SERIAL No.) OUT1 TIMER=120 MINUTES 0 SECONDS	With this command the output will be activated for a number of defined minutes. In the example 120 minutes (2 hours) was used. The output is activated immediately after the acknowledge SMS has been send out and it is deactivated automatically when the timer runs out. NOTE: <u>It is possible to break the output before the timer runs out by using the "OFF" command.</u>
Permanent activation of the output	MT OUT1=ON	MTC ACK (SERIAL No.) OUT1 ON	With this command the output is activated permanently. The output can be de-activated again using the "OFF" command.
Deactivation of the output	MT OUT1=OFF	MTC ACK (SERIAL No.) OUT1 OFF	With this command the output is deactivated. The command will work for any activation mode either "time controlled" or "permanent".

NOTE: For the "Send SMS" it is of no importance if small or capital letters are used in the command string, or a mixture hereof.

Safety precautions

The use of the digital output is restricted to signals/systems/components related to comfort applications in the vehicles.

Under no circumstances must it be used for purposes, which can influence the safety of the vehicle when driving.

M-tec holds no liability for any damages occurred to persons, vehicles, moving machines, construction machines etc. caused by wrong installation and/or faulty use of the digital output.

Warranty

M-Tec A/S products are covered by a limited manufacturer warranty. The M-tec A/S warranty is limited to the warranty rules and legislation present in each country. The warranty only covers manufacturing faults.

The warranty does not cover misuse, wrong installation or damage due to a faulty installation or wrong maintenance.

The invoice act as the proof of warranty, so please keep it as reference for any warranty complaints.

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, please contact M-tec A/S

M-tec A/S
Industrivej 10
9490 Pandrup
Tel: +45 99 73 00 20
Fax: +45 96 73 74 07

E-mail: support@m-tec.dk
<http://www.m-tec.dk/en/>
www.trackunit.com

When contacting technical support, please be prepared to provide the information listed below:

Minimum Information Required for Technical Assistance

If you or a user reports difficulty with a mobile engine unit (i.e. no GPS fixes, not communicating, LED not working, etc.), it is helpful to retrieve directly from the unit all current configuration settings and the message log data etc, that is accessible by the technical support when they receive the following information about the unit.

1. Unit Serial number

Complaints

Return of faulty products must always be accompanied by a complaint note.
The template for returning complaints can be downloaded from the M-Tec website:

http://www.m-tec.dk/en/gsm_applications/rma/

If a returned product that was announced faulty, turns out not to have any errors when tested at the factory, an examination invoice with a fee of DKR 250,- per product plus return freight costs will be issued – not taken into consideration the original purchase costs.

Try to make the error description as detailed as possible. Insufficient error descriptions will extend the service time. The terms “Defective”, “Does not work”, “Dead” etc. are not accepted as a detailed error description.

When the complaint note has been filled out, please send it to our service department. At the following e-mail address:

service@m-tec.dk

Print out the complaint note and pack it together with the faulty product and send both to the following address.

M-tec A/S
Industrivej 10
DK-9490 Pandrup
Denmark
Attention: Service

Safety first

Simple Guidelines

Please follow these guidelines when configuring, using or recycling the ME301. Violating these guidelines may be dangerous, illegal or otherwise detrimental. Further detailed information is provided in this manual.

Do Not Operate Where Prohibited

Do not allow the ME301 unit to operate wherever wireless phone use is prohibited or when doing so may cause interference or danger. The ME301 cannot be turned off after installation, so any vehicle, moving machinery, construction machinery using ME301 etc. must not enter areas where it is prohibited to operate wireless phones. Examples include but are not limited to operation in hospitals, aircrafts, near blasting sites or wherever operation can cause interference.

Interference

Like all wireless devices, the ME301 may encounter electrical interference that may affect its performance.

Avoid Body Contact with Device during Operation

Do not operate the ME301 in direct contact with your body. Maintain at least 10 inches (25 cm) separation between the device and any parts of your body.

Qualified Service

Except for batteries and Subscriber Identification Module (SIM) card, the ME301 contains no user serviceable or replaceable parts. Non-functioning units must be returned to an authorized service center for repair or replacement.

Accessories and Batteries

Use only approved accessories or batteries. Do not connect incompatible products. There is risk of explosion or fire if an incorrect type replacement battery contacts are shorted. Do not exceed the temperature ranges or other environmental conditions specified by the battery manufacturer. Dispose of used batteries according to the instructions provided with the batteries.

Water-Resistance

The Mobile engine ME301 series is water-resistant according to the IP-67 standard. It is however recommended that it is be used where it is relatively dry and not subjected to either water streams or submersion.

Recycling

For information on how to recycle this product in the European Union, go to either web page www.trackunit.com or www.m-tec.dk.

Detailed Safety Information

Exposure to Radio Frequency Signals

The ME301 unit is a low power radio transmitter and receiver. When it is ON, it receives and also sends out radio frequency (RF) signals. **The ME301 unit cannot be turned off after installation, so the unit operates in an always ON mode, for approximately of 3 to 4 days depending on the charging state of the backup battery.**

The ME301 unit is not designed to be worn on a person's body.

Electronic Devices

Most modern electronic equipment is shielded from RF signals. However, certain electronic equipment may not be shielded against the RF signals generated by the ME301 unit.

Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of six (6") inches be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. The following precautions apply:

- The ME301 unit is not intended for handheld use or to be worn on the body.
- A minimum separation of ten (10") inches (25 cm) is to be maintained between the ME301 unit and any persons' body at all times.
- Do not carry the ME301 on your person.

Other Medical Devices

If any other personal medical devices are used in the vicinity of a ME301 unit, consult the manufacturers of the medical devices to determine if they are adequately shielded from external RF energy. Physicians may be able to assist in obtaining this information.

The ME301 unit cannot be turned off after installation, so any vehicle, moving machinery, construction machinery installed with the ME301 etc. must not operate near health care facilities when any regulations posted in these areas prohibit the use of wireless phones or two-way radios. Hospitals and health care facilities may be using equipment that could be sensitive to external RF energy.

Vehicles

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles. Check with the manufacturer or its representative regarding the vehicle. Also consult the manufacturer of any equipment that has been added to the vehicle.

Posted Facilities

The ME301 unit cannot be turned off after installation, so any vehicle, moving machinery, construction machinery installed with the ME301 etc. must not enter any facility where posted notices prohibit the use of wireless phones or two-way radios.

Aircrafts

FCC and FAA regulations prohibit using wireless phones while in the air. Do not carry the ME301 unit aboard an aircraft as it cannot be turned off.

Blasting Areas

The ME301 unit cannot be turned off after installation, so any vehicle, moving machinery, construction machinery installed with the ME301 etc. must not enter a "blasting area" or in

areas posted “turn off two way radio” to avoid interfering with blasting operations. Obey all signs and instructions.

Potentially Explosive Atmospheres

The ME301 unit cannot be turned off after installation, so any vehicle, moving machinery, construction machinery installed with ME301 etc must not enter any area with a potentially explosive atmosphere and obey all signs and instructions. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always marked clearly. Potential areas may include: fueling areas (such as gasoline stations); below deck on boats; fuel or chemical transfer or storage facilities; vehicles using liquefied petroleum gas (such as propane or butane); areas where the air contains chemicals or particles (such as grain, dust, or metal powders); and any other area where it would normally be advisable to turn off motor vehicle engines it is not allowed to enter with a vehicle, moving machinery, construction machinery installed with the ME301.

For Vehicles Equipped with an Airbag

An airbag inflates with great force. DO NOT place objects, including the ME301 unit, in the area over the airbag or in the airbag deployment area. If in vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

Specific Absorption Rates (SAR)

THE ME301 UNIT IS NOT DESIGNED TO BE WORN ON A PERSON'S BODY. AS SUCH, BODY WORN TEST POSITIONS FOR THE ME301 UNIT ARE NOT REQUIRED BY EITHER THE EN50360/1 FOR GSM 900/1800 BANDS OR FCC REQUIREMENTS FOR GSM 850/1900 BANDS.

The ME301 unit is not intended for handheld use or to be worn on the body. A minimum separation of ten (10”) inches (25 cm) is to be maintained between the ME301 and any persons' body. Additional information on Specific Absorption Rates (SAR) can be found on the Cellular Telecommunications & Internet Association (CTIA) Web site at www.ctia.org.

Battery Safety Information

Adhere to the following guidelines to avoid the risk of fire or explosion:

1. Dispose of the used battery according to the instructions provided with the battery.
2. Do not drop, puncture, disassemble, mutilate, or incinerate the battery.
3. Touching both terminals of a battery with a metal object will short circuit the battery. Do not carry batteries loosely if the contacts may touch coins, keys, and other metal objects (such as in pockets or bags).
4. Do not stack batteries taken out of the carry case.
5. Do not heat the batteries to try to rejuvenate their charge.
6. Do not exceed the temperature ranges or other environmental conditions specified by the battery manufacturer.
7. Never use the ME301 without the battery cover installed.

Specifications

Product specifications

The ME301 unit is a GSM/GPRS quad-band-unit with GPS, integrated antennas and a backup battery

Connections:

Operational voltage (supply voltage):	12 - 24 V DC
Absolute maximum voltage range:	9 - 65 V DC
Standby consumption (GSM-receiver active)	20 mA / 10 mA (average, at 12V / 24V)
Consumption during charging on an empty battery	160 mA / 80 mA (max, at 12V / 24V)
Standby time on the backup-battery	48 – 96 hours (Bad – optimum installation)
Charging time for an empty backup-battery	3 hours at 25 °C
Expected lifetime of the backup-battery	3 years
Digital inputs	3
Digital outputs	1

Temperature range:

In active running mode	-30°C to +60°C
Storage	-40°C to +70°C

GSM/GPRS-specifications:

EGSM/GPRS/EGPRS 900/1800/850/1900

Maximum output power at EGSM-GPRS 900 MHz:	2W
Maximum output power at GSM-GPRS 850 MHz:	1.5W
Maximum output power at GSM-GPRS 1800/1900 MHz:	1W

GPRS-class 10 device

Mechanical specifications

Dimensions:	Length:	75 mm
	Width:	45 mm (49 mm incl. mounting cradle)
	Height:	18 mm (23 mm incl. mounting cradle)
	Cable length:	270 cm

Environmental class:	IP67
Enclosure material:	Non-flammable ABS

Weight: 60 g (excluding the cable)

Variants

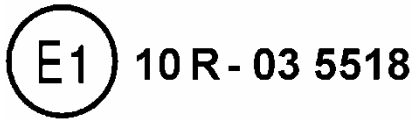
The following variants of the ME301 devices currently exist:

Variant 1 (M-tec stock no. 7400.0310) – (ME301-1)

GSM/SMS/GPRS based surveillance of level change on 3 digital inputs and 1 digital output for relay control, including GPS positioning reporting. The unit is fitted with an internal backup battery and internal antennas for GSM and GPS.

Approvals and certificates

The Mobile Engine products of the type model ME301 is certified according to the following recommendations:



Contains
FCC-ID: 09EQ2687
IC-ID: 3651C-Q2687

FCC

The ME301 product complies with FCC Part 15, FCC Part 24, and Industry Canada requirements.

The ME301 product complies with Part 15 of the FCC rules. 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.

EEC/ International

- The ME301 product complies with the essential requirements of the Automotive Directive 2004/104/EEC - UN regulative ECE R10 EMC rev. 3
- The ME301 product complies with the essential requirements of the Directive 75/322/EEC – amended by 2000/2/EC.
- The ME301 product complies with the essential requirements of the EMC 2004/108/EEC directive.

Including:

ISO 13309:2000	Construction machinery
ISO 13766:2006	Earth-moving machinery
EN ISO 14982:1998	Agricultural and forestry machines

And:

EN 60068-2-64	Random vibration
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CE

The ME301 product complies with the essential requirements of the R&TTE Directive 1999/5/EC as stated by the EC Declaration of Conformity (CE0682).

Certificates and Declaration of conformity (DOC) statements can be downloaded from the M-Tec website:

http://www.m-tec.dk/en/gsm_applications/certificates/



Kraftfahrt-Bundesamt
DE-24932 Flensburg

E1

MITTEILUNG
ausgestellt von:
Kraftfahrt-Bundesamt

über die Genehmigung
eines Typs eines elektrischen/elektronischen Bauteiles nach der
Regelung Nr. 10

COMMUNICATION
issued by:
Kraftfahrt-Bundesamt

concerning approval granted
of a type of electrical/electronic sub-assembly with regard to
Regulation No. 10

Erweiterung Nr.: --
Extension No.:

Nummer der Genehmigung: **036518**
Approval No.:

1. Fabrikmarke (Handelsname des Herstellers):
Make (trade name of manufacturer):
M-Tec AJS
2. Typ:
Type:
ME301

in den Ausführungen - versions:
A: ME301-1
B: ME301-2
C: ME301-3
D: ME301-4

Handelsbezeichnung(en):
General commercial description(s):
ME301



Confirmation

No.: QM EMC AM 09 01 91

M-TEC AJS
Industrivej 10
DK-6490 Pandrup
Denmark

has been inspected with regard to the initial assessment as base for international approvals granted by the German Federal Motor Transport Authority Kraftfahrt-Bundesamt (KBA).

The initial assessment following the legal requirements regarding its QM system has been performed with positive result.

M-TEC AJS is listed by TÜV SÜD Automotive as approval holder for electronic products homologated through KBA.

The scope of application is valid in principle for the type approval procedure of the KBA at the following "legal applicable ranges".

EC directives:
72/45/EEC amendment 2006/106/EC (Type approvals for the classes M/N/O)
97/24/EC ch. 8 amendment 2006/72/EC ch. 8 (Type approvals for 2/3-wheeled vehicles)

UN regulation:
ECE-R10 Rev. 03 (Approvals for the classes L/M/N/O)

Department: Electronics Safety (AM-SEE/MUC - ms)
Date: 2009-01-27


Merlin Schwab - Department Manager



0921

Corporate Office

M-Tec A/S
 Industrivej 10
 9490 Pandrup
 Denmark.
www.m-tec.dk
www.trackunit.com

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Release Notice

This document is release 1.4 of the Mobile Engine ME301, Technical Manual.

THIS MANUAL IS INTENDED FOR USE BY SYSTEM INTEGRATORS, SERVICE PROVIDERS AND APPLICATION DEVELOPERS (COLLECTIVELY, "RESELLERS"). IT IS NOT INTENDED FOR END-USERS OF THE MOBILE ENGINE. ANY END-USER DOCUMENTATION IS TO BE PREPARED AND FURNISHED BY THE RESELLERS.

The following Product Limited Warranty gives Resellers specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Product Limited Warranty

Subject to the terms and conditions set forth herein, M-Tec A/S ("M-Tec") makes the following warranty only to its Resellers who purchase the Mobile Engine hardware product ("Product") directly from M-Tec: for a period of one (1) year from the date of shipment from M-Tec, the Product will substantially conform to M-Tec's standard published specifications for the Product and the Product hardware will be substantially free from defects in materials and workmanship. The foregoing warranty shall not apply to embedded software/firmware components.

THIS PRODUCT LIMITED WARRANTY IS PROVIDED TO RESELLERS AND TO RESELLERS ONLY. RESELLER IS SOLELY RESPONSIBLE FOR ANY AND ALL WARRANTIES MADE TO ITS CUSTOMERS, AND M-TEC MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND SHALL HAVE NO OBLIGATIONS OR LIABILITY TO RESELLER'S CUSTOMERS OR END-USERS OF THE PRODUCT. RESELLER SHALL NOT MAKE ANY REPRESENTATIONS OR WARRANTIES ON M-TEC'S BEHALF, AND SHALL FULLY INDEMNIFY, DEFEND AND HOLD M-TEC HARMLESS FROM ANY BREACH OF THE FOREGOING. IF RESELLER DISTRIBUTES PRODUCT TO END-USER CUSTOMERS, RESELLER SHALL BE SOLELY RESPONSIBLE FOR PREPARING AND PROVIDING PRODUCT WARRANTIES AND PRODUCT LITERATURE TO END-USERS.

Warranty Remedies

If the Product fails during the warranty period for reasons covered by this Product Limited Warranty and Reseller notifies M-Tec of such failure during the warranty period, M-

Tec at its option will repair OR replace the nonconforming Product, OR refund the purchase price paid by Reseller for the Product, provided that Reseller returns the Product to M-Tec in accordance with M-Tec's standard return material authorization procedures or as otherwise instructed by M-Tec.

Warranty Exclusions and Disclaimers

The foregoing Product Limited Warranty shall only apply in the event and to the extent that (i) the Product is properly and correctly installed, configured, interfaced, maintained, stored and operated in accordance with M-Tec's specifications, and (ii) the Product is not modified or misused. This Product Limited Warranty shall not apply to, and M-Tec shall not be responsible for, defects or performance problems resulting from: (a) the combination or utilization of the Product with hardware or software products, information, data, systems, interfaces, services or devices not made, supplied or specified by M-Tec; (b) the operation of the Product under any specifications other than, or in addition to, M-Tec's standard published specifications for the Product; (c) the unauthorized installation, modification or use of the Product; (d) damage caused by: accident, lightning or other electrical discharge, water immersion or spray, or exposure to environmental conditions for which the Product is not intended; or (e) normal wear and tear on consumable parts, including by way of example and without limitation, batteries.

M-TEC DOES NOT WARRANT OR GUARANTEE THE RESULTS OBTAINED THROUGH THE USE OF THE PRODUCT. THE FOREGOING TERMS OF THE PRODUCT LIMITED WARRANTY STATE M-TEC'S ENTIRE LIABILITY, AND RESELLER'S EXCLUSIVE REMEDIES, RELATING TO THE USE AND PERFORMANCE OF THE PRODUCT EXCEPT AS OTHERWISE EXPRESSLY PROVIDED FOR IN THIS PRODUCT LIMITED WARRANTY, THE PRODUCT, ACCOMPANYING DOCUMENTATION AND MATERIALS, AND/OR ANY EMBEDDED SOFTWARE/FIRMWARE AND UPDATES THERETO ARE PROVIDED "AS-IS" AND WITHOUT EXPRESS OR IMPLIED WARRANTIES OF ANY KIND, BY EITHER M-TEC OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, INSTALLATION OR DISTRIBUTION, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NONINFRINGEMENT. THE STATED EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF M-TEC ARISING OUT OF, OR IN CONNECTION WITH, THE PRODUCT. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING:

M-TEC IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF GPS SATELLITES OR WIRELESS SERVICE OR THE AVAILABILITY OF GPS SATELLITE SIGNALS OR WIRELESS SERVICE. THE PRODUCT MAY CONTAIN TECHNOLOGY THAT IS NOT FAULT TOLERANT AND IS NOT DESIGNED, MANUFACTURED OR INTENDED FOR USE IN ENVIRONMENTS OR APPLICATIONS IN WHICH THE FAILURE OF THE PRODUCT WOULD LEAD TO DEATH, PERSONAL INJURY OR SEVERE PHYSICAL OR ENVIRONMENTAL DAMAGE OR SEVERE FINANCIAL LOSS. ANY USE OR DISTRIBUTION BY RESELLER OR ITS CUSTOMERS IN CONNECTION WITH ANY SUCH

ENVIRONMENT OR APPLICATION SHALL BE AT RESELLER'S AND ITS CUSTOMERS' SOLE RISK, AND M-TEC SHALL HAVE NO LIABILITY WHATSOEVER IN CONNECTION THEREWITH. RESELLER SHALL INDEMNIFY AND HOLD M-TEC AND ITS SUPPLIERS HARMLESS FROM ANY CLAIM BROUGHT AGAINST M-TEC WHICH ARISES FROM RESELLER'S USE OR DISTRIBUTION OF THE PRODUCT IN CONNECTION WITH SUCH ENVIRONMENTS OR APPLICATIONS. SOME STATES AND JURISDICTIONS DO NOT ALLOW LIMITATIONS ON DURATION OR THE EXCLUSION OF AN IMPLIED WARRANTY, SO CERTAIN OF THE ABOVE LIMITATIONS MAY NOT APPLY TO EVERY RESELLER.

Embedded Software/Firmware

The Product and associated tools, if any, may contain embedded software/firmware, which is licensed, not sold, and is only for use within the Product as an integral part thereof. Such embedded software/firmware (which includes all updates thereto) contains valuable trade secrets and is proprietary to M-Tec and its suppliers. To the greatest extent permitted by law, such embedded software/firmware may not be modified, copied, disassembled, decompiled or reverse engineered. M-Tec reserves all other rights.

Limitation of Liability

M-TEC'S ENTIRE LIABILITY REGARDING THE PRODUCT SHALL BE LIMITED TO THE AMOUNT ACTUALLY PAID BY RESELLER FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL M-TEC OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANY WAY TO THE PRODUCTS, ACCOMPANYING DOCUMENTATION AND MATERIALS, AND ANY EMBEDDED SOFTWARE/FIRMWARE AND UPDATES THERETO (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF DATA OR ANY OTHER PECUNIARY LOSS), REGARDLESS OF WHETHER M-TEC HAS BEEN ADVISED OF THE POSSIBILITY OF ANY SUCH LOSS AND REGARDLESS OF THE COURSE OF DEALING BETWEEN M-TEC AND RESELLER. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO EVERY RESELLER.

Notices

Class B Statement – Notice to Users. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Regulatory Approvals

CE

The Mobile Engine ME301 products comply with the essential requirements of the R&TTE Directive 1999/5/EC as stated by the EC Declaration of Conformity (CE0682). The Mobile Engine products comply with the European Telecommunications Standards Institute Specifications EN 301 489-1 (EMC for GSM 900MHz and DCS 1800MHz Radio Equipment and Systems).

EEC/ International

The Mobile Engine ME301 products comply with the essential requirements of the Automotive directive 2004/104/EC clause 6.5, 6.6, 6.8 and 6.9, UN regulative ECE R10 EMC rev3.

The Mobile Engine ME301 products comply with the essential requirements of the Directive 75/322/EEC – amended by 2000/2/EC.

The mobile Engine ME301 products comply with the essential requirements of the EMC 2004/108/EEC directive. The mobile Engine ME301 products comply with the international standards ISO-13309, ISO13766 and EN ISO-14982, for tractors, forest and agricultural machinery, moving machinery and construction machinery.

FCC

The Mobile Engine ME301 products comply with the FCC Part 15, FCC Part 24, and Industry Canada requirements. The Mobile Engine ME301 products comply with Part 15 of the FCC rules. 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.

The Mobile Engine ME301 products satisfy the RF exposure compliance as defined in FCC Part 2.1091 and Part 1.1307 for fixed mounted operations in that the antenna gain is lower than 1.4 dBi at 850 MHz / 7 dBi at 1900 MHz.

For fixed mounted operations the Mobile Engine ME301 must be installed to provide a separation distance of at least 20 cm from all persons.

Mobile Engine ME301:

Contains FCC ID: O9EQ2687

Contains IC-ID: 3651C-Q2687