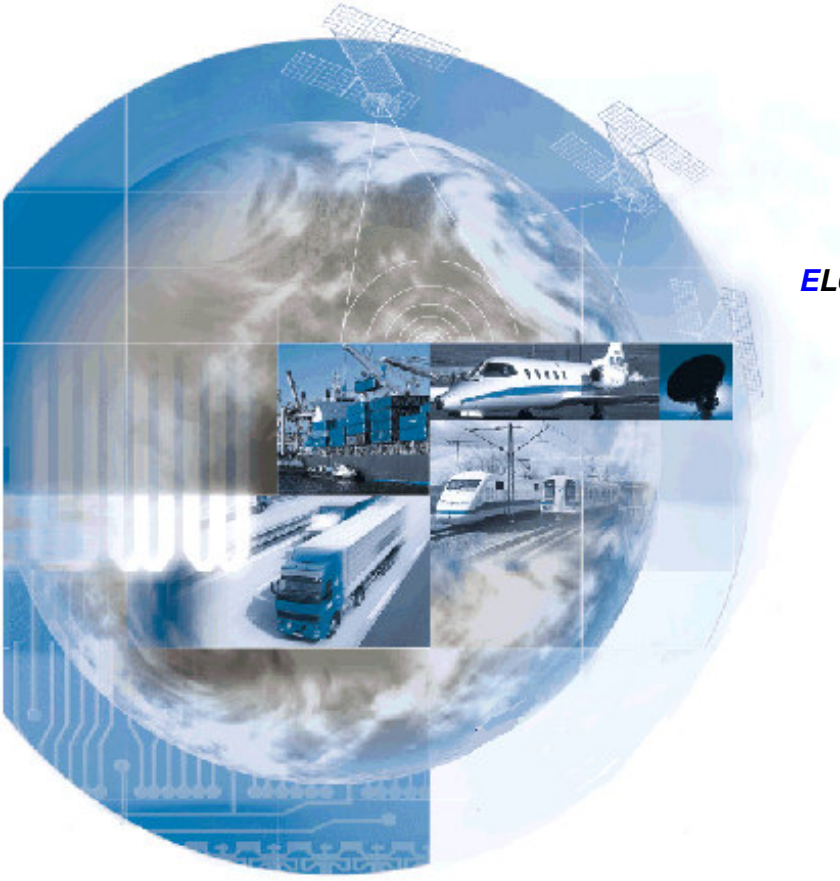

EasyTrack

***ELCON* BASIC SYSTEM FOR TRACKING DATA**

Operating Manual

Order No.: 9537-1

NOTICE

This device contains 900 MHz/1800 MHz GSM functions that are not operational in U.S. Territories.
This filing is only applicable for 1900 MHz PCS operations.

Statement according to FCC part 15.19:
This device 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.

Statement according to FCC part 15.21:
Modifications not expressly approved by this company could void the user's authority to operate the equipment.

Statement according to FCC part 15.105:
NOTE: 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 communications.
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 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.

RF Exposure mobile:
The external antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Dear customer:

ELCON Systemtechnik would like to thank you for your confidence when purchasing the onboard unit **EasyTrack**.
This User Manual is intended to help you to activate your **EasyTrack** and the **EasyTrack Manager** as quickly as possible.
It provides you with a brief description of setup under Windows® operation systems.

Please make sure to read this user manual carefully, before you bring the unit into service!

Familiarize with the operation and functions of **EasyTrack**.

Keep the user manual and other descriptive documentation for your reference.

Should you still have questions as this manual might not cover all details, our service partner will be happy to help you.

This user manual is subject to change without notice.

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Safety Notes

Before installing and starting the device, read the information given in the operating manual most carefully. In doing so, you will take advantage of the device's full scope of functions and avoid damages due to improper use.

- The device reflects the current state of the art and complies with the applicable safety standards.
- Operate the device only in proper condition and strictly according to the operating instructions.
- Works on the device, including its opening, must only be done by authorized service personnel.
- For the electrical connection of the device, ensure the correct line voltage (see chapter Technical Data)!
- Always disconnect the device from mains before you open it!
- In the event of failure, please contact the manufacturer or your agency in charge.
- Only end devices complying with the safety standard according to EN 60950 and bearing the CE-mark, are permitted to be connected to the interfaces of the device.
- The end devices must have suitable plug connections, otherwise appropriate adapters are to be used.
- End devices must only be operated at the interfaces provided for.

Besides the safety notes mentioned above, you will find complementary installation instructions in the according chapters.

This operating manual is subject to change without notice.

For any further questions relating to the configuration and installation of your device, please refer to the manufacturer.

TABLE CONTENTS

1 Introduction

1.1 Practical application of EasyTrack

EasyTrack is a most efficient positioning system which is able to perform the parallel processing of up to 12 GPS satellite signals and to send data relating to the vehicle and its position to a central office/transport company via GSM radio network. The mobile device is part of a modern information and monitoring system consisting of both hard and software components serving for:

- innovative transport companies
- their partners
- and customers

The use of EasyTrack enables suppliers, transport companies and customers to get essential information about the vehicles in service as well as their cargo and position via on-line access.

1.2 Symbols used in this manual

Warning
contains ***important*** information on operation of your EasyTrack and EasyTrack Manager.

Caution
must be observed to avoid any problems on your PC or damage of your EasyTrack.

Notes contain information on operation of your EasyTrack and EasyTrack Manager.

1.3 System requirements for installation

The on-board voltage is permitted for 9 ... 36V.

You can choose one of three different ways to connect the EasyTrack to your vehicles power cables:

1) If you connect the power pins and "Dig. Input 1" to constant power, the EasyTrack will send always SMS using the predefined interval setting.
2) If you connect the power pins and "Dig. Input1" to Ignition, the EasyTrack will send interval SMS only if Ignition is ON. With every power ON you will have no GPS data in the SMS until GPS position is fixed.
3) If you connect the power pins to constant power and "Dig. Input 1" to Ignition, the EasyTrack will send interval SMS only while Ignition is ON.
   The GPS module is powered continuously, thus a GPS position can be sent with every SMS (depends on GPS availability) Note: The EasyTrack will always draw about 100mA from your vehicles battery!

The GPS antenna must be installed in such a way that its free line to the sky is ensured.
The GSM antenna must be installed in such a way that a free connection to the GSM net can be established and its shielding by metal parts is excluded.

2 Installation

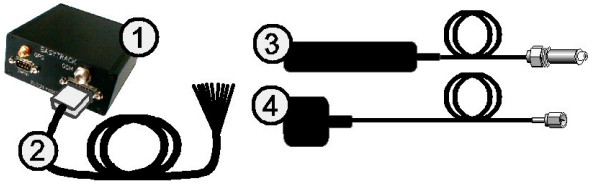
Before you start the installation of the device make sure to follow the best sequence for you to work on.
For a normal setup we recommend this sequence:

1) Operate the EasyTrack first close to your PC using the optional power supply for EasyTrack.
2) Configure the EasyTrack with your specific data (EasyTrack-ID, PIN, vehicle sensor information, interval time,...). See chapter 4.7.3
3) Install the EasyTrack inside the vehicle and test it. See chapter 2.5

If you own a laptop which is capable of running the EasyTrack-Manager, we recommend you to install the EasyTrack inside the vehicle and make the configuration and test on board.

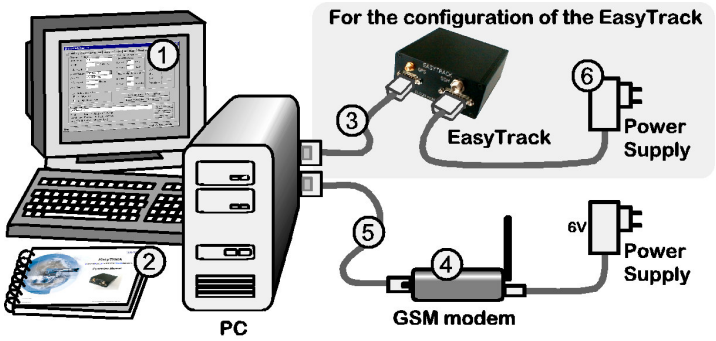
2.1 Scope of supply

2.1.1 Vehicle equipment



1. EasyTrack device
   Order no. **6618**
2. Cable loom power / input
   Order no. **9409**
3. GSM antenna
   Order no. **a0397**
4. GPS antenna
   Order no. **9410**

2.1.2 Office equipment



1. PC software ***EasyTrack Manager***
   for Microsoft Windows® Order no. **9542**
2. EasyTrack Operating Manual
   Order no. **9537**
3. Null modem cable 3m
   Order no. **9541**
4. GSM/GPRS Office Modem (Triband)
   Order no. **9372**
5. Connecting cable for office modem 1.8m
   D-Sub connector, male/female, 9 pin.
   Order no. **9512**
6. Power Supply for EasyTrack
   Order no. **a0075**

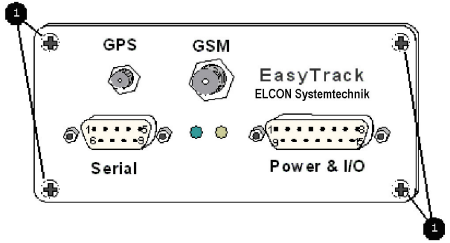
2.1.3 Optional Accessories

If your PC has no serial interface (RS232), but a USB interface, you may realize the connection to EasyTrack also via a USB converter.

- USB converter
  including serial cable, adapter and driver CD
  Order no. **9520**

2.2 Insertion of SIM card

Use a normal 3V or 5V SIM card for mobile phones Before installing EasyTrack, the SIM card must be inserted into the device. For this purpose, open the 4 screws ❶ at the front side of the device.



Pull the circuit board out of its enclosure. Afterwards insert the SIM card you received from the service supplier with its beveled edge at the correct position into the device (see fig. 1). If you have received a check card format SIM card, please remove the smaller section.

⚠ In order to avoid any destruction of EasyTrack, the device must be switched off!

⚠ To reduce the risk of damaged equipment. Before any part of the circuit board is touched be sure to discharge yourself by touching a grounded surface of the device!

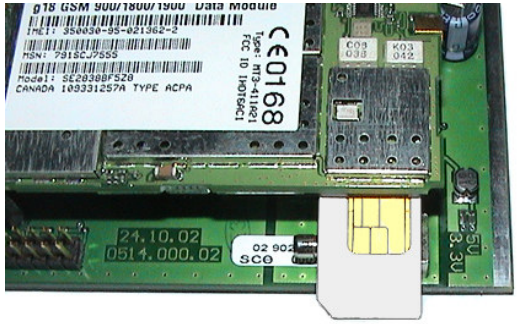


figure 1; insert SIM card

2.3 Installation position and fastening

The device is contained in a small box, which may be attached to a surface using 4 screws at the fastening points.

The device has neither a keyboard nor a display and can therefore be installed in a concealed position.

As to the installation of EasyTrack, any installation position is allowed, as long as you choose a dry place where no person can be injured.

Be sure the cables are tied closely to the easy track to prevent excessive vibrating of the cables, and possible damage to the connectors.

Do not install the cables in such a way that they are tight or strained, allow some slack to avoid potential cable damage

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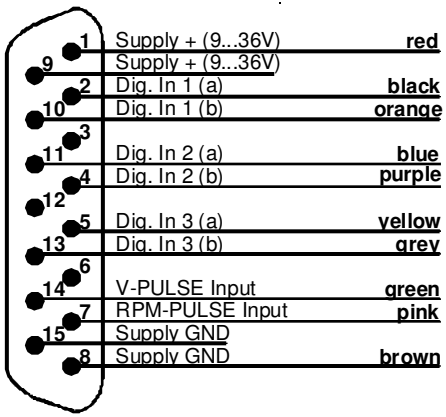
2.4 Connection options

POWER & I/O



view to the solder side of the cable connector

Digital Inputs (9…36V):
Connect the positive line to (a) and the ground to (b)

Signals with the same name are already connected inside the EasyTrack.

2.5 Installation of the device

Safety notes:

Upon the installation of EasyTrack, the following safety notes must be observed!

- When disconnecting the negative pole of the battery, the safety instructions of the automobile manufacturer must be observed.
- When drilling holes for the fixing of EasyTrack, it must be paid attention to the fact that neither parts of the vehicle nor electric cables are damaged.
- The cross section of the positive and negative cable must be no less than 0.5 mm^2.
- In the event of faulty installation, operational malfunctions of the vehicle's electronic system or of the EasyTrack may occur.
- The manufacturer's supplied cables must be used when connecting EasyTrack to the connection points recommended by the vehicle manufacturer.
- For safety reasons we recommend that you install the GSM antenna at least one meter away from any persons in the driver's cabin

2.6 Installation instructions

See figure 2; wiring overview

- Select any installation position in the vehicle.
- Bore the fastening holes for the fastening angles.

  ⚠ Observe the above mentioned safety instructions!
- Fix the EasyTrack at the vehicle.
- Establish the cable connection between EasyTrack and vehicle.

  ⚠ To avoid short circuits, make sure that the cables neither jammed nor cut off by flexible vehicle parts!
- Selection of a suitable position for the GPS and GSM antennas.

  ⚠ Undisturbed satellite communication must be ensured!
- Bore the fastening holes and establish the cable grommet for the GPS and GSM antennas.

  ⚠ Observe the above mentioned safety instructions!

The GSM antenna is an stick-on-window mount style antenna.

- Establish the cable connection between the EasyTrack and the GPS and GSM antennas.

  ⚠ Bend radius must be minimum 1cm!

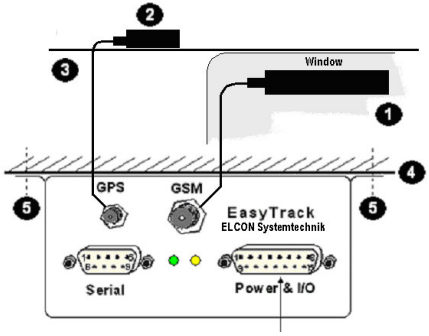


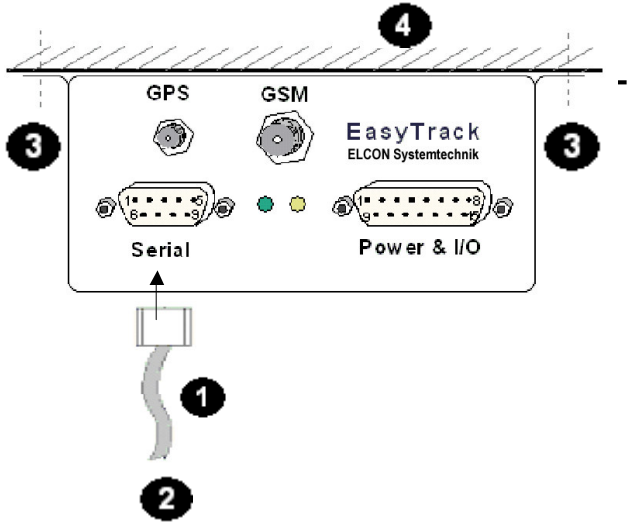
figure 2; wiring overview

- Power input of EasyTrack
- Input of **v** pulse and RPM pulse
- 3 digital input
- wiring cable ( )

❶ GSM antenna
❷ GPS antenna
❸ Car roof
❹ Car chassis
❺ Fastener for the fixing

2.7 Serial Interface (RS232)

- Via the serial interface RS232 it is possible to connect a PC or notebook to configure EasyTrack.
- The end devices must have compatible plug connectors. Their connection must be realized only by means of the transmission cable recommended by the manufacturer.
- It might be necessary to use suitable adapters.
- The end devices must only be connected to the interface provided for.



❶ Serial interface cable (null modem cable)
❷ Service/configuration
(possible connections: PC, Notebook)
❸ Fastener for the fixing
❹ Car body

3 Relevance of the LEDs

At the front side of the device, a green and a yellow LED indicate the operational status of EasyTrack.

Immediately after switching on the EasyTrack, its boot loader is started which allows the upload of new EasyTrack firmware. During this time (approx. 2 seconds) both LEDs flash rapidly. After that the yellow LED indicates that the hardware check is carried out. Following the hardware check, the yellow LED is turned off and the green LED flashes slowly. In this case the device is ready to operate - but it is still waiting for a valid GPS-position. The green LED will stay on permanently once the GPS position connection has been established.

The yellow LED indicates the state of Dig. Input 1. If you have connected the EasyTrack to permanent power and your vehicles ignition is connected to Dig. Input 1, the Yellow LED will be permanently on when activated by the ignition. (SMS transfer enabled) and turn off while ignition is off (SMS disabled).

Additionally there is an internal activity of the GSM-Modem displayed by flashing on the yellow LED.
The duration of the flashing helps you to determine the actual operation of the GSM-Modem:

short (approx. 0,5s):	EasyTrack checks incoming SMS.
medium (approx. 2..4s):	Sending SMS
long (> 6s) :	SMS cannot be sent

Since firmware version 2.3 the yellow LED flashes slowly when the GSM filed intensity is below 10%, so this is an indicator (like the green LED for GPS), that no net is available to send an SMS.

If the yellow LED flashes very quick with the following pattern: 3 time on, then pause (and so on), then a GSM error exists. Either no SIM card or the wrong PIN are entered. Connect a laptop to the EasyTracks serial port to see the details.

4 EasyTrack Manager

4.1 General Information

EasyTrack Manager is a software program, which works on a standard PC, equipped with Windows 9x / NT 4.0 / Windows 2000 or Windows XP. To run this program, no special hardware is required. The program name of the EasyTrack Manager is: *EasyTrackManager.EXE*. The program EasyTrack Manager consists of 2 files: the executable file *EasyTrackManager.EXE* and the initialisation file *EasyTrackManager.INI*.

4.2 Summary of functionalities

- Writing configuration data into the EasyTrack,
- Reading configuration data from the EasyTrack
- Receiving SMS data from EasyTrack via GSM office modem
- Sending SMS data via GSM office modem
- Logging data from EasyTrack within a tracking file for displaying the coordinates within a map
- Logging data from EasyTrack and other sources of informations within a LOG file

4.3 System Requirements

Hardware:

PC-compatible computer with:

- Intel® Pentium® Processor or compatible with 266 MHz or higher
- 32 MB RAM
- 5 MB of disk space
- 640 x 480 minimum screen resolution
- minimum one serial port

Software:

The EasyTrack Manager is a 32-bit application. It runs on Microsoft®

- Windows 95 / 98 / 98 SE
- Windows NT 4.0
- Windows 2000
- Windows XP

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Windows®, Windows NT® and Microsoft® are registered trademarks of Microsoft Corp.

4.4 First Steps

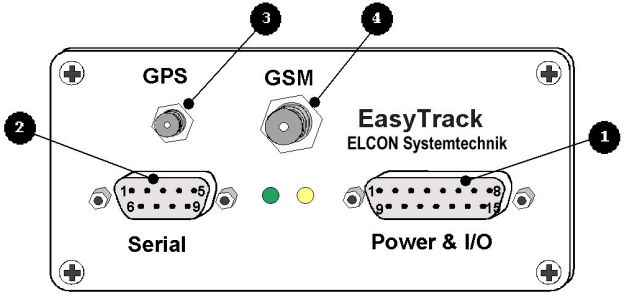


figure 3; front view

- Make sure that your PC and the EasyTrack are switched off.
- Connect your EasyTrack to the main power supply connector ❶ and have a look on the LEDs to check the proper operation of EasyTrack. Directly after power-up, both LEDs flash quickly for the period of 5 seconds. Afterwards, the green LED indicates the hardware status, while the yellow LED indicates the communication status with the GSM modem. The green LED flashes slowly (1 s on/1 s off) if everything is in order.
- Plug one end of the null modem cable supplied into the appropriate port ❷ of the EasyTrack and the other end into a free serial port (e.g. COM1 or COM2) on your PC.
- Plug the antenna connector for GPS into port ❸.
- Plug the antenna connector for GSM into port ❹.
- Switch the computer on and follow the instructions of the chapter: *Installation*

4.5 Installation / Deinstallation

To install EasyTrack Manager on your computer

1) Start Windows®
2) Insert the EasyTrack Manager CD into the CD-ROM drive, and then follow the directions on the screen. If the installation program does not start automatically, click on **Start** and then on **Run**. In the **Run** dialog box, enter **E:\SETUP.EXE** in the command line and click on the OK button. If your CD-ROM drive has a drive letter other than **E**, substitute the appropriate letter.
   The installation program starts. The subsequent procedure is menu-driven. The remainder of the installation is automatic, so that it is not required to enter any further information.

figure 4; Splash Screen

3) Select the preferred options and follow the on-screen instructions.
4) After the EasyTrack Manager software has been successfully installed, click on the button **Finish** to exit the installation program.

4.6 Uninstall EasyTrack Manager

To uninstall EasyTrack Manager on your computer, click on

Start ▸ Program Files ▸ ELCON mobility ▸ EasyTrack Manager ▸ Uninstall EasyTrack Manager

or start the SETUP.EXE of EasyTrack Manager from the CD-ROM and follow the on-screen instructions.

Note:
If the EasyTrack Manager does not start or run properly, try to repair your installation by calling the SETUP.EXE of EasyTrack Manager from the CD-ROM. Select the Repair button in the following dialog. This option fixes missing or corrupt files, shortcuts, and registry entries.

If you need to update or repair the EasyTrack Manager all CSV files (for Mappoint) and also the LOG file will remain on your computer. So no data will get lost.

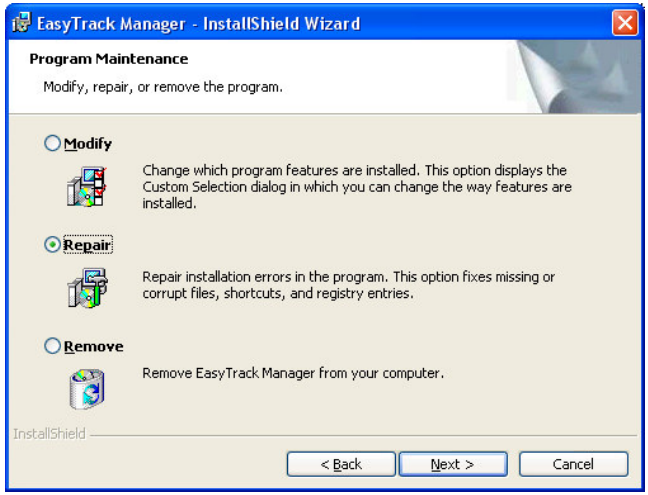


figure 5; repair installation

4.7 Working with EasyTrack Manager

4.7.1 Starting EasyTrack Manager

Click one after the other on the following buttons on your task bar:

Start ▸ Program Files ▸ ELCON mobility ▸ EasyTrack Manager ▸ EasyTrack Manager,

to start the program, or do a double click on the EasyTrack Manger symbol in the new program group.

Click on **Start** and then in succession

Program Files ▸ ELCON mobility ▸ EasyTrack Manager ▸ EasyTrack Manager

to start the program or do a double click onto the EasyTrack Manager symbol which is displayed on the desktop screen.

4.7.2 Presentation of EasyTrack Manager

The application has been developed for a monitor resolution of at least 640*480 pixels. After the program start, a start-up sequence is displayed for approx. 5 sec. After that, the main window is opened with a number of individual work packages implemented on register cards. For the EasyTrack configuration as well as for the configuration of the application, the following register cards are available:

- Configuration
- Actual Data
- SMS Data
- Office Modem (GSM)
- Settings
- Firmware Upload and
- Info.

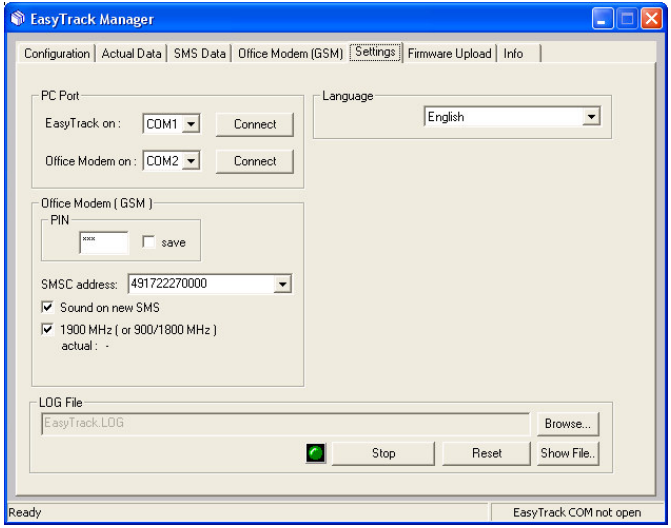


figure 6; main window

4.7.2.1 Start-Up Sequence

For the start-up sequence, the EasyTrack Manager shows the following message box for 5 seconds. The displaying of the start-up window can be terminated by pressing the left mouse key within the displaying window. As an alternative, the ESC key can be used. After the start-up sequence, the last used register card is shown.

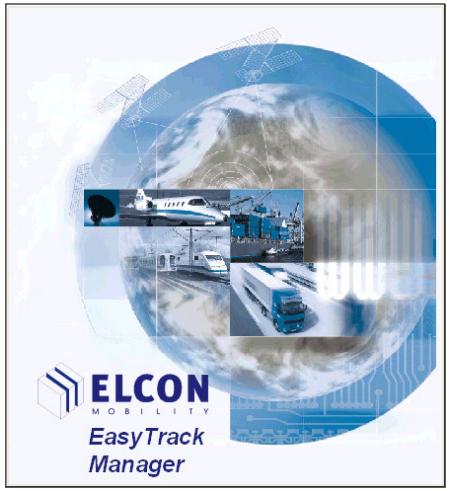


figure 7; start-up screen

4.7.2.2 Status Bar

The status bar is displayed in the lowest line of the application window. On the right side of the status bar you can see the status of the communication to an EasyTrack. The following states are considered:

EasyTrack COM not open	The COM port indicated on the register card **Settings** is not open.
EasyTrack not available	The interface indicated could be opened, however, it cannot communicate with an EasyTrack.
EasyTrack available	Communication with an EasyTrack exists.

4.7.2.3 Use of the keyboard

Via the TAB key the name of a register card can be selected. If one card has shown the input focus as displayed in ***figure 6***, another register tab can be selected via the right or left cursor keys. The controls on one register card can be chosen by the TAB key.
If the input focus is on a combo box, the list box of this combo box is about to be made visible with the key F4.

4.7.3 Register Card "Settings"

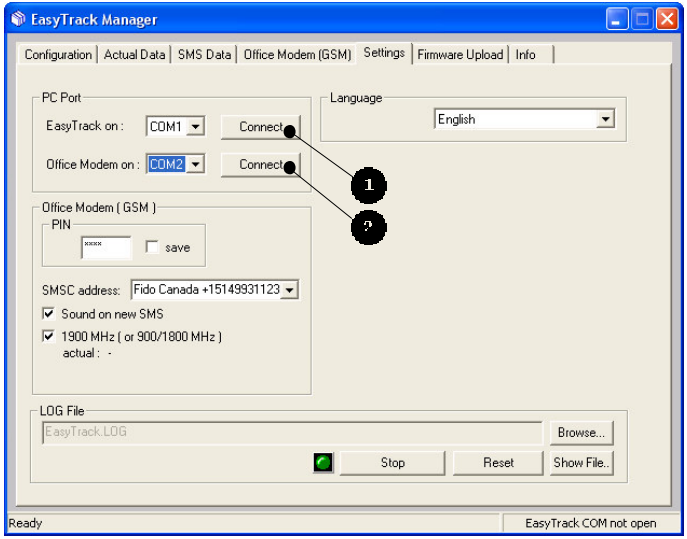


figure 8; Register Card **Settings**

4.7.3.1 PC Port

After the first start of the EasyTrack Manager, the application is not connected automatically to a COM port. The user has to define, which COM port shall be used by the application. After the definition of the COM port, press the appropriate **Connect** button to connect the COM port to the EasyTrack (see ❶) or the GSM office modem (see ❷). If a connection has been established, the appropriate button text is switched to **Disconnect**. All COM ports are closed automatically if the application is closed.

4.7.3.2 Language

In the field **Language** one of two national languages (English and German) can be chosen to be used by the application for the text display and file entries.

4.7.3.3 Office Modem (GSM)

The GSM modem is a GSM900/1800/1900 Phase II+ device. 1900MHz band is used in North America; see checkbox **1900MHz**.

PIN

Depending on the type of your SIM card, it may be protected against misuse by a four- to eight-digit PIN.

⇨ If required, enter the according PIN, which is stored on the SIM card, into the input field. If no pin is required, select the checkbox **automatic**

If the wrong PIN is transmitted to the office modem three times, the SIM card will be blocked. At the same time, the EasyTrack Manger opens a dialog box for the entry of the PUK and PIN.

figure 9; PUK dialog

⇨ **save**

If the check box (displaying options) is activated, the PIN in the edit field will be saved into the INI file.

⇨ **SMSC address:**

Please enter the phone number of the service center in the manner described by the network operator. Enter the SMSC address with the international access character +

The SMSC is necessary to send a SMS from the office modem to the EasyTrack.

⇨ **Sound on new SMS**
If this checkbox is activated, a signal is emitted via the loudspeakers in the event of an incoming SMS.

⇨ **1900 MHz (or 900/1800MHz)**
Activate this checkbox if your GSM modem should work in 1900 MHz band (i.e. North America).
If the actual band setting is not the required one, do the following steps to change the band setting.

1) disconnect COM port ❷
2) activate or deactivate the checkbox **1900MHz**
3) connect COM port ❷
4) now modem waits for a power cycle. Reconnect the power supply of the office modem to apply the change.
5) reconnect COM port ❷

4.7.3.4 LOG File

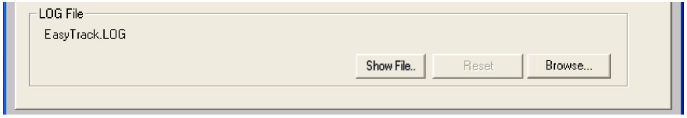


figure 10; LOG file

The EasyTrack-Manager writes a lot of useful information into the specified file as plain text.
You can change the filename and folder within the dialog box that appears when you click **Browse** (button)

Example of a LOG file

```
================================================================================
C:\Program Files\ELCON mobility\EasyTrack Manager\EasyTrack.LOG

========== START EasyTrack Trace 12:35:19 PM Monday, December 16, 2002 ==========
12:35:20 PM 12/16/2002: EasyTack Manager: Software Version: 1.20
12:35:20 PM 12/16/2002: GSM Office Modem: Type: Motorola
12:35:20 PM 12/16/2002: GSM Office Modem: Software Version: g18_vE6.02.10.00
12:35:20 PM 12/16/2002: GSM Office Modem: Actual Band Setting: 1900 MHz
12:35:21 PM 12/16/2002: GSM Office Modem: actual SMSC: +15149912345
12:35:21 PM 12/16/2002: GSM Office Modem: Signal Quality: 100 %
12:35:32 PM 12/16/2002: M1;EasyTrack      ;OK;OK;165136161202;A;N;4255.8952;W;08113.2900;   1;   1;   0;   0;   1;   0;   0;I;   0;I;   0;I;
0;   0000;  0;   0;  0;  0;    0;*06
```

⇨ **Browse (button)**
Via the **Browse...**button, any file with suffix **.LOG** can be selected from any folder.
If the filename entered doesn't exist, a new file will be generated.

⇨ **Show file (button)**
In order to show the content of the file indicated in the input field, the button **Show file** can be selected. This button is only active if the file indicated in the input field also physically exists. The log file is an ASCII file, which is displayed with NOTEPAD.EXE or WORDPAD.EXE.
Note:
NOTEPAD.EXE is only able to handle a file size of less than 64 kBytes.

⇨ **Reset (button)**
After the selection of the button **Reset**, the content of the LOG file will be deleted.

4.7.4 Register Card "Configuration"

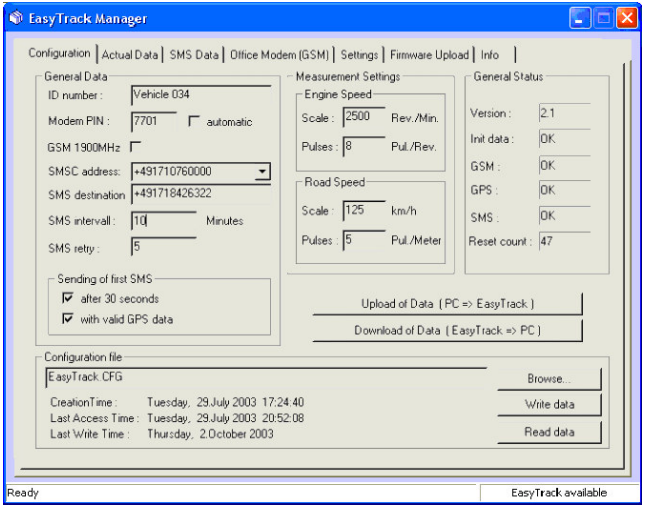


figure 11; Register Card **Configuration**

Note:
This register card will only show data, if you have a enabled connection to your EasyTrack.

Via the register card **Configuration**, the configuration data of EasyTrack are entered. In order to realize a minimum configuration of EasyTrack, the fields have to be specified within the group General Data. However, this way EasyTrack can only perform the transmission of the position but not of the vehicle-related data such as road speed, driving time, engine speed, idle time and distance.

To carry out a configuration of EasyTrack, a direct connection between PC and EasyTrack via a serial cable must exist (please refer to chapter "Status Bar").

- ***Status Bar***

  In the lower right corner of the application, the EasyTrack Manager communication status to EasyTrack is displayed. If **EasyTrack COM not open** is displayed, no upload or download of data is possible. In addition, no actual data can be read from EasyTrack. Refer to **PC Port** on register card **Settings**, to open the appropriate COM port. If COM port is open and EasyTrack is connected with the EasyTrack Manager, **EasyTrack available** is shown in the status bar. If the EasyTrack Manager cannot communicate with EasyTrack, **EasyTrack not available** is displayed.

  On the left hand side of the status bar, communication errors between EasyTrack and EasyTrack Manager and other sources of information are displayed.

- ***General Data***
  The fields within the group **General Data** must be indicated to ensure the faultless functioning of EasyTrack.

  ⇨ **ID number**
  In the field ID number a name with 15 characters at most must be specified, through which you may identify the corresponding device if EasyTrack sends an SMS to the office modem.

  ⇨ **Modem PIN**
  Depending on the type of your SIM card, it may be protected against misuse by a four-digit PIN.

  If required, enter the according PIN, which is stored on the SIM card, into the input field. If no pin is required, select the checkbox **automatic**.

  If the wrong PIN is transmitted to the GSM modem three times, the SIM card will be blocked. In this case, extract the SIM card from the EasyTrack and insert it into a GSM mobile phone. Via the mobile phone, the PUK and PIN, which are now required, can be entered.

  ⇨ **automatic** (Checkbox)
  see **Modem PIN**

  ⇨ **GSM 1900 MHz** (checkbox)
  The default setting of the GSM modem is for 900/1800MHz band. For PCS operation (1900MHz) you need to change the band.
  Do the following steps to change the band settings:

  1) activate the checkbox **1900MHz**
  2) use the button **Upload of Data** to apply the data to EasyTrack and GSM modem
  3) follow the instructions of EasyTrack Manager, then remove the power supply of the EasyTrack for about 5 seconds to apply the change
  4) reconnected the EasyTrack and wait for it to be responding again to the EasyTrack Manger.

  ⇨ **SMSC address**
  enter the phone number of the service center (SMSC => Short Message Service Center) in the manner as described by the network operator. Enter the SMSC address with the international access character + (e.g. ***+15149931123***).

  ⇨ **SMS destination**
  Please enter the phone number to which EasyTrack shall send the messages. Enter the phone number with the international access character + .

⇨ **SMS interval**
Please specify the period of time for which EasyTrack shall wait between two messages. The maximum value is 1440 minutes, which is equal to 24 hours.

⇨ **SMS retry**
Please enter the number of retries (1 up to 10) which EasyTrack shall carry out in the event of a GSM communication error - for instance if EasyTrack temporarily cannot find any GSM net. The default value of EasyTrack is 5 retries.

⇨ *Sending of first SMS*
after 30 seconds (Checkbox)
Select the checkbox for sending an SMS after 30 seconds after power-up of EasyTrack.

⇨ *Sending of first SMS*
with valid GPS data (Checkbox)
Select the checkbox for sending an SMS after power-up, if EasyTrack has a valid GPS position.

- ***Measurement Settings***

If EasyTrack is supposed to transmit also the vehicle-related data within a SMS, the scaling parameters for **Engine Speed** and/or **Road Speed** must be specified. Since the number of impulses per kilometer varies with different vehicles, it is necessary to adjust EasyTrack for the appropriate vehicle.

Note: In all fields only decimal numbers are allowed.

⇨ *Engine Speed* **Scale** (Rev./Min.)
In the input field, enter the 100% value, which is to be used by EasyTrack as a maximum value when partitioning into 3 ranges (Range 1 up to Range 3) see chapter 4.7.5 Range 1, 2 and 3.
This input field has a maximum value of 65535 revolution per minutes.

⇨ *Engine Speed* **Pulses** (Pul./Rev.)
The numerical characteristic giving the value of the input signal required to show and record the revolutions of the engine. This constant shall be expressed in pulses per revolution. This input field has a maximum value of 255 pulses per revolution.

⇨ *Road Speed* **Scale** (km/h)
see: Engine Speed **Scale**
This input field has a maximum value of 65535 kilometers per hours.
Note:1 km/h <=> 0.621 mph

⇨ *Road Speed* **Pulses** (Pul./Meter)
The numerical characteristic giving the value of the input signal required to show and record a distance traveled of one meter. This constant shall be expressed in pulses per meter. This input field has a maximum value of 255 pulses per meter.
Note: Since Firmware Release 2.0: If you enter the value 0 (zero) here, the EasyTrack will use the GPS speed instead of wheel pulses

- ***General Status***
  All data in this group will be updated every 5 seconds.
  All shown values represent the sum of the bits that are set.
  Example: GSM Error "5" means that Bit 1 & Bit 4 are set

  ⇨ **Version**
  Shows the software version of the firmware of EasyTrack.

  ⇨ **Init data**
  The field **Init data** displays **OK** if, within the value transmitted by EasyTrack, the following bits are set:

  Bit 1 target number OK

  Bit 2 provider number OK

  Bit 4 phone number of EasyTrack OK

  Bit 8 PIN OK

  Bit 16 parameter for speed and revolution measurement ok

  If one or several bits are not set, a configuration error has occurred. In this case, check your configuration data and reload the modified configuration into the EasyTrack.

⇨ **GSM**
Shows the status for the GSM module of EasyTrack. If no error has occurred, OK is displayed. EasyTrack signalizes the following error statuses:

Bit 1: faulty AT command test
GSM module does not answer to an AT command.

Bit 2: incorrect PIN
insert a PIN which is valid for the SIM card, into the field **Modem PIN**. Reload the configuration data into the EasyTrack.

Bit 4: error within the SMS provider number
enter a valid SMSC in the field **SMSC address**. Reload the configuration data into the EasyTrack.

Bit 8: SIM card error
Check whether the SIM card has been inserted according to installation instructions (see chapter 2.2). If you cannot identify any fault, check the SIM card by means of a mobile phone.

⇨ **GPS**

Shows the status for the GPS module of EasyTrack. If no error has occurred, OK is displayed. EasyTrack signalizes the following error states:

Bit 1: no signal received from GPS receiver

Bit 2: no telegram received from GPS receiver

Bit 4: no response from GPS receiver

⇨ **SMS**

Shows the SMS status of EasyTrack. In the current version of the EasyTrack firmware, no error is signalized yet, for this reason the field **SMS** of EasyTrack Manager displays **OK**.

⇨ **Reset count**

Shows the number of the resets carried out by EasyTrack.

- ***Configuration file***
  On register card **Configuration**, all configuration data can be entered through a dialog field. All input data are stored after having left this register card and in case the program is closed. In addition, the input data can be stored in a configuration file (.CFG). For this purpose, a valid path and file name have to be indicated in the input field **Configuration file**. If no file name has been given yet, the storing of a file can also be started through the button **Write data...**. In this case it has the same function like the button **Browse...** and the data will be written after file selection. If the file indicated in the input field **Configuration file** is found, the data of this file are shown in the according fields (**Creation Time**, **Last Access Time** and **Last Write Time**. The data can now be stored with the **Write data...** button.
- ***Upload of Data (PC => EasyTrack)***
  If a connection to EasyTrack is available, all entries on the register card **Configuration** can be loaded into EasyTrack. Please observe that EasyTrack must carry out a reset to adopt the new data.
- ***Download of Data (EasyTrack => PC)***
  If a connection to EasyTrack is available (see status bar), actual data of EasyTrack will be downloaded after clicking on this button. This function works also automatically, after selection of register card **Configuration.**

4.7.5 Register Card "Actual Data"

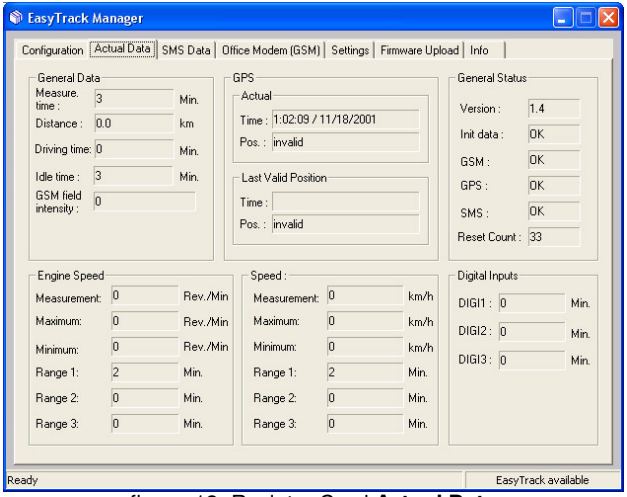


figure 12; Register Card **Actual Data**

On the register card **Actual Data** all currently valid data of EasyTrack are displayed.

- ***General Data***

  ⇨ **Measure. time**
  Indicates the measurement period which has passed since the transmission of the last SMS.

  ⇨ **Distance**
  Indicates the distance which has been covered since the transmission of the last SMS.

  ⇨ **Driving time**
  Indicates the driving time (speed > 0 km/h) which has passed since the transmission of the last SMS.

  ⇨ **Idle time**
  Indicates periods of idle time (speed = 0 km/h) occurred since the transmission of the last SMS.

  ⇨ **GSM field intensity**
  Indicates the current radio field strength 0 – 100%.

- ***GPS***

  ⇨ Actual **Time**
  Displays the time/date received by the GPS receiver not in UTC format, but as local time. The time zone as set under windows and the settings for summer time are considered.

  ⇨ Actual **Pos.**
  Indicates the current position of EasyTrack.

  ⇨ Within the group **Last Valid Position** the last valid position and time/date displayed under **Actual** are shown.

- ***General Status***
  The data within the group **General Status** are displayed as described under Register Card "Configuration".
- ***Engine Speed***
  - ⇨ **Measurement**
    Indicates the current value of the motor's rotational speed in revolution per minute.
  - ⇨ **Maximum**
    Indicates the maximum value in revolution per minute performed since the last SMS transmission.
  - ⇨ **Minimum**
    Indicates the minimum value in revolution per minute performed since the last SMS transmission.
  - ⇨ **Range 1**
    Indicates the motor's rotational speed in percent, within the scope of 0 and 30% of the maximum revolution.
  - ⇨ **Range 2**
    Indicates the motor's rotational speed in percent, within the scope of 30.1 and 80% of the maximum revolution.
  - ⇨ **Range 3**
    Indicates the motor's rotational speed in percent, within the scope of 80.1 and 100% of the maximum revolution.
- ***Speed***
  - ⇨ **Measurement**
    Indicates the current speed value.
  - ⇨ **Maximum**
    Indicates the maximum value in km/h performed since the last SMS transmission.
  - ⇨ **Minimum**
    Indicates the minimum value in km/h performed since the last SMS transmission.
  - ⇨ **Range 1**
    Indicates the speed in percent, within the scope of 0 and 30% of the maximum speed.
  - ⇨ **Range 2**
    Indicates the speed in percent, within the scope of 30.1 and 80% of the maximum speed.
  - ⇨ **Range 3**
    Indicates the speed in percent, within the scope of 80.1 and 100% of the maximum speed.
- ***Digital Inputs***
  Shows the status of the signal inputs DIGI1, DIGI2 and DIGI3.
  For further information, please refer to chapter 2.4.

4.7.6 Register Card “SMS Data”

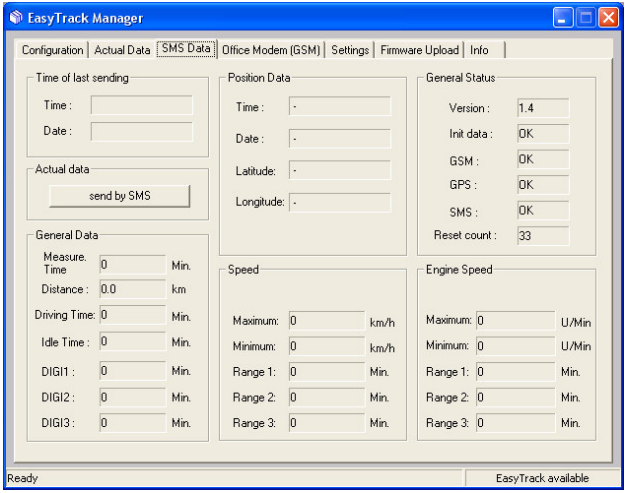


figure 13; Register Card **SMS Data**

On the register card **SMS Data**, the data of the SMS last sent by EasyTrack are indicated. For this purpose, a direct serial cable connection to the EasyTrack is required. The relevance of the according fields corresponds to those described in chapter 4.7.5 Register Card “Actual Data”. All differing fields are subsequently described.

-

- ***Time of last sending***
  Indicates time and date (local time) at which Easy Track has sent the last SMS.

- ***Actual Data***
  If the EasyTrack is ready-to-receive, i.e., connected to the EasyTrack Manager (see chapter 4.7.2.2), EasyTrack can be requested to send the current data by clicking on the button **send by SMS**. In the event of according configuration, the receipt of these data can be stated on the register card **Office Modem (GSM)**.

- ***Position Data***
  Within the group **Position Data** the current data of the position valid at the time, when the last SMS has been sent by EasyTrack, are indicated.

  ⇨ **Time**
  ⇨ **Date**
  Shows the time/date received by the GPS receiver not in UTC format, but as local time. The time zone as set under windows and the settings for summer time are considered.

  ⇨ **Latitude**
  ⇨ **Longitude**
  Indicates the current position. If the GPS receiver cannot determine any position or no valid position yet, “invalid” is displayed.

4.7.7 Register Card "Office Modem (GSM)"

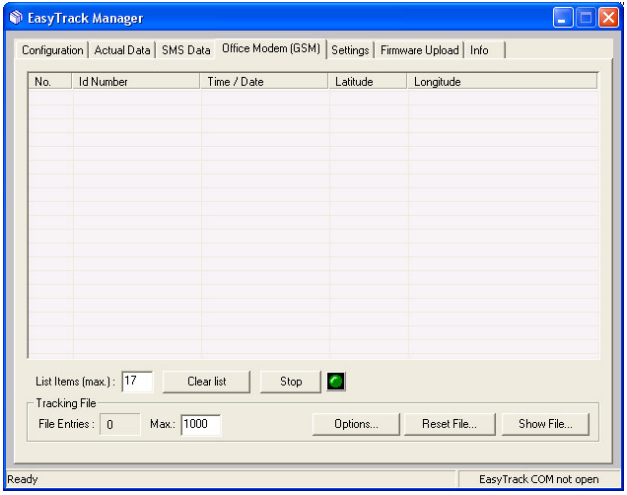


figure 14; Register Card **Office Modem (GSM)**

On the register card **Office Modem (GSM)** all SMSs received by the office modem are displayed within a list field. In the event of a reboot of the EasyTrack Manager, all entries stored in this list before, get lost.

- ***List Items***
  In the input field **List Items** the maximum value for the entries within the list field can be specified. A maximum of 100 list entries can be displayed.
- ***Clear List (button)***
  The button **Clear List** can be used to delete the content of the list field.
- ***Apply (button)***
  The button **apply** is indicated in the position of the button **Clear List**, if the value in the input field **List Items** has been changed. The changed value is adopted by clicking the button **Apply**.
- ***Start [or Stop] (button)***
  The button **Start** or **Stop** can be used to start or to stop the entries in a so-called **Tracking File**. If the button **Start** is clicked, its activation is indicated by a green LED. If the writing is deactivated, it is indicated by a red LED.

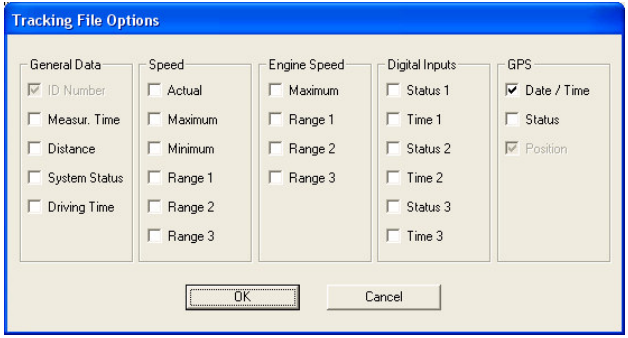
Tracking File

Position, ID number and other selectable parameters (see **Options**…) sent by EasyTrack, are stored in a tracking file. If the EasyTrack Manager receives an SMS sent by EasyTrack, the data records received are stored in two files. The file **EasyTrack Manager.CSV** stores all data records, no matter which EasyTrack has sent them. In addition, the data records received are stored in a file specified for EasyTrack. This file is automatically stored under the name, which is indicated in the field **ID Number** on register card **Configuration**. All tracking files are stored in the folder **…\EasyTrack Manager\TRACK**

⇨ **File Entries**
Indicates the number of entries within the tracking file: **EasyTrack Manager.CSV**.

⇨ **Max.**
In this input field a maximum value (1000) for the entries within the tracking files can be specified. If the value in the input field is changed, the **Apply** button appears on the right hand side of the input field, which has to be clicked to adopt the changed value.

⇨ **Options…**
Via the button **Options…** the following dialog field can be opened



in which the options to be included in the tracking files, can be selected.
ID Number and **Position** cannot be deactivated and are therefore always written into the tracking files.
The relevance of the according fields corresponds to those which are described in 4.7.5 Register Card “Actual Data”.

Note:
After changing the options all CSV files will be initialized. All the current data from the CSV files will be backed up in files that have the extension TFB.

⇨ **Reset File... (button)**
After clicking on the button **Reset**, the following dialog field is opened, in which those tracking files can be selected of which the content is partly or completely to be deleted. The deleting of the entries is carried out depending on the settings indicated in the dialog field **Reset Options**. The setting can be carried out via the button **Options...**.

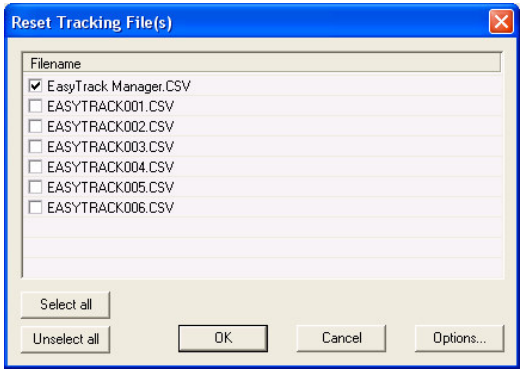


figure 15; Reset Tracking File(s)

Via the buttons **Select all** and **Unselect all**, all of the check boxes in front of the file name will be selected or unselected.

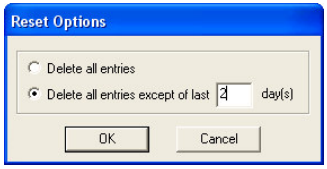


figure 16; Reset Options

⇨ **Show File... (button)**
Through the button Show File... a tracking file can be selected for being displayed. In the list field all files of the folder **...\EasyTrack Manager\TRACK** are listed. Select the corresponding file and click the OK button to display the selected file. If you don't want to select a file, click the button **Cancel**.

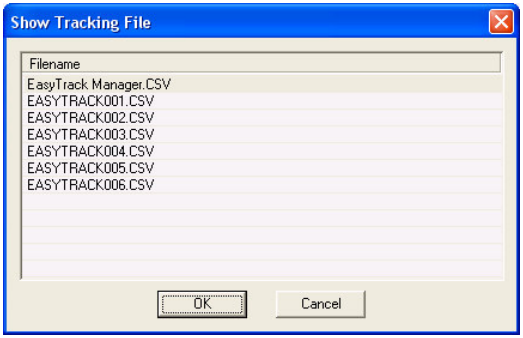
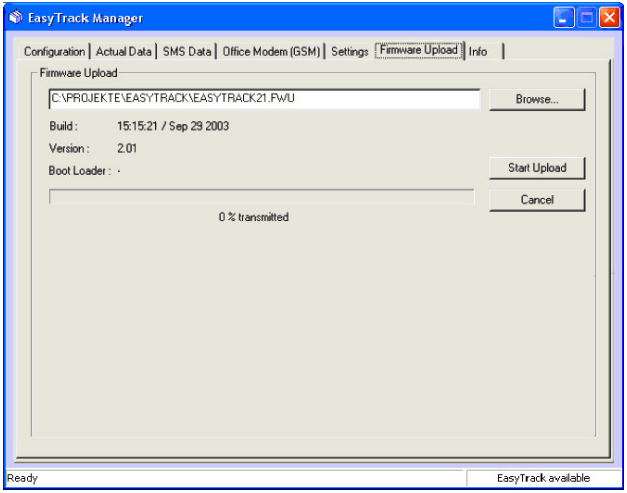


figure 17; Show Tracking File

4.7.8 Register Card “Firmware Upload”



If there are firmware updates available for your device you are able to download them into the EasyTrack by yourself.
You need to have the EasyTrack connected with the serial null modem cable to the PC and have made the correct COM port settings on the register card **Settings**.
Choose the supplied file with the help of the **Browse** dialog and then **Start Upload**.

Watch the bottom line of the EasyTrack-Manager, since useful information about the upload progress are available here.
After having finished the upload switch to the register card **Configuration** page and have a look to the actual status field **Version**.
The number of the new firmware should appear when the EasyTrack has finished rebooting.

4.7.9 Register Card “Info“

The register card **Info** shows the current version of the EasyTrack Manager and the link to the internet site of ELCON Systemtechnik.

5 Changed Functionality on Different Firmware Releases

Changes in Version 1.6
Digital Input 1 has to be activated in order to transmit periodical SMS.
The EasyTrack has to be continuously powered. This avoids a GPS "Cold Start" with every trip that you start.
Easy Track will require a few minutes to connect with the GPS signal.

Note: EasyTrack will draw about 90mA (@12V) current from your vehicle's battery while it is continuously powered.

Changes in Version 1.7
The EasyTrack will **check the level of cellular radio strength intensity** before it will send SMS data.
This firmware change avoids trip data lost in the case where coverage is below 10%.
The next successful SMS transfer will include all the summarized information from the previous messages not sent.

Changes in Version 2.0
An update to this firmware release is obligatory for EasyTrack, thus 1.6 and 1.7 may produce GSM errors after EasyTrack has started up.
Additionally, included in this firmware is the **use of "GPS-Speed"** instead of wheel pulses. If you configure your EasyTrack "pulse per meter" value to 0 (zero), the EasyTrack will calculate and transfer trip data based on the speed information that is provided by the GPS receiver (dependant on the availability of the GPS signal).

Changes in Version 2.3
GSM module will be forced to search for a network if it fails to do by itself (targets a bug in the GSM module, that occurs rarely after 2 weeks of continuous operation)

Changes in Version 2.4
The GPS module will be restarted if it fails to send data (issue in winter with old type of GPS modules)

Changes in Version 2.5
The values for MAX-Speed and MIN-Speed are smooth filtered so wrong values (i.e. double speed) are avoided

Changes in Version 2.6
Fixed a bug where it could happen, that after switching off the vehicle in a place where no GSM was available, the unit forgot to send a message with the next ignition ON

6 Technical Data

This chapter is subject to modifications!

6.1 Technical Description

- serial interface (RS232) for the operation/connection of display, keyboard, PDA, bar code scanner and the like.
- GPS positioning (NMEA protocol)
- GSM SMS; in general, data transfer is possible within the transparent mode
- Measuring of vehicle speed **v**
- simultaneous speed at time of sending
- average speed **v** within logging interval $\mathbf{t_i}$
- minimum speed **v** within logging interval $\mathbf{t_i}$
- maximum speed **v** within logging interval $\mathbf{t_i}$
- 0 - 30% of maximum speed **v** in % of $\mathbf{t_i}$
- 30.1 - 80% of maximum speed **v** in % of $\mathbf{t_i}$
- 80.1 - 100% of maximum speed **v** in % von $\mathbf{t_i}$
- logging of the idle time in % of $\mathbf{t_i}$
- logging of the running time in % of $\mathbf{t_i}$
- logging of the motor's rotational speed
- simultaneous revolution **D** at time of sending
- average revolution **D** within logging interval $\mathbf{t_i}$
- minimum revolution **D** within logging interval $\mathbf{t_i}$
- maximum revolution **D** within logging interval $\mathbf{t_i}$
- 0 - 30% of maximum revolution **D** in % of $\mathbf{t_i}$
- 30.1 - 80% of maximum revolution **D** in % of $\mathbf{t_i}$
- 80.1 - 100% of maximum revolution **D** in % of $\mathbf{t_i}$
- In addition, other activities, such as those of the brakes, ignition and headlights, may be logged (three different signals).

6.2 Technical Data

Approval
EasyTrack has been approved according to the following guidelines:

1. Type approval for mobile radio equipment of digital cellular radio telecommunications systems (GSM and DCS) according to ETSI
2. Type approval for mobile and portable radio equipment of digital cellular radio telecommunications systems (GSM and DCS) according to FCC
3. Type approval according to the directive of the EEC for the adaptation of the regulations of the member states about the radio disturbances of vehicles (e1-Mark and E1-Mark) in compliance with the directive 72/245/EEC and 95/54/EC
4. Complies with the requirements of electrical safety according to EN 60950
5. Complies with the requirements of international transportation of dangerous merchandises on the road (AVR)

Serial interface RS 232

Software update and data exchange

Power supply

Operating voltage	9 up to 36V
Input electricity	max. 2 A
Current consumption in standby mode	90mA (@12V)

Control unit 8-bit microprocessor

Inputs

- 3 (Status: high / low)
- pulses for road speed
- pulses for revolution

GSM module

- GSM class 4 (2Watt)
- automatic switching to performance class 5 (0.8W)
- 900/1800/1900 MHz

Enclosure and ambient conditions

Dimensions of enclosure	105 × 106 × 44 mm^3 (opt. fastening angle)
Color of enclosure	black
Mass of the device	437 g
Temperature for transport / storage	-40 °C ... +85 °C
Scope of operating temperature	-30 °C ... +70 °C
Limitation of GSM modem	-30°C ... +60°C
Mechanical strength	concerns VDE 0115, component 200
Oscillation	3 g up to 5 g; 200 Hz per axis
Shock	15 g for 15 ms in 3 axes

7 Abbreviations

GPS	Global Positioning System
GSM	Global System for Mobile Communications
NMEA	National Marine Electronics Association
RSSI	Radio Signal Strength Indication
SMSC	Short Message Service Center (GSM)
UTC	Universal Time Coordinated (coordinated world time).

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