

ATB50v1 – GPRS / GPS Based Fleet Management Terminal

Datasheet



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1. Introduction

ATB50 is a compact, standalone and economical, but yet powerful and feature rich fleet management terminal. Comprising of a dual-band GSM/GPRS modem and a CORTEX based CPU, ATB50 enables its users to wrap their own products and services around our technology, in order to add value to their customers. Incorporating a standard and reliable TCP/IP communication stack, the precisely designed application layer protocol serves the system developer with a variety of convenient messages, commands, alarm triggers, etc. Three digital inputs and one MOSFET output are dedicated for various purposes, like engine crank inhibition, vehicle idle control, emergency button implementation etc. Two separate UARTs are provided for system extension purposes like driver authorization, two way messaging terminal, navigation, trailer identification. e.t.c. The optional CAN BUS interface enables collecting important vehicle data directly from vehicle's ECU: fuel consumption metering, rpm, speed, weight, maintenance information e.t.c. With its integral housing, compact design, low power consumption and affordable price ATB50 is an ideal choice for your fleet management applications.

2. Block Diagram

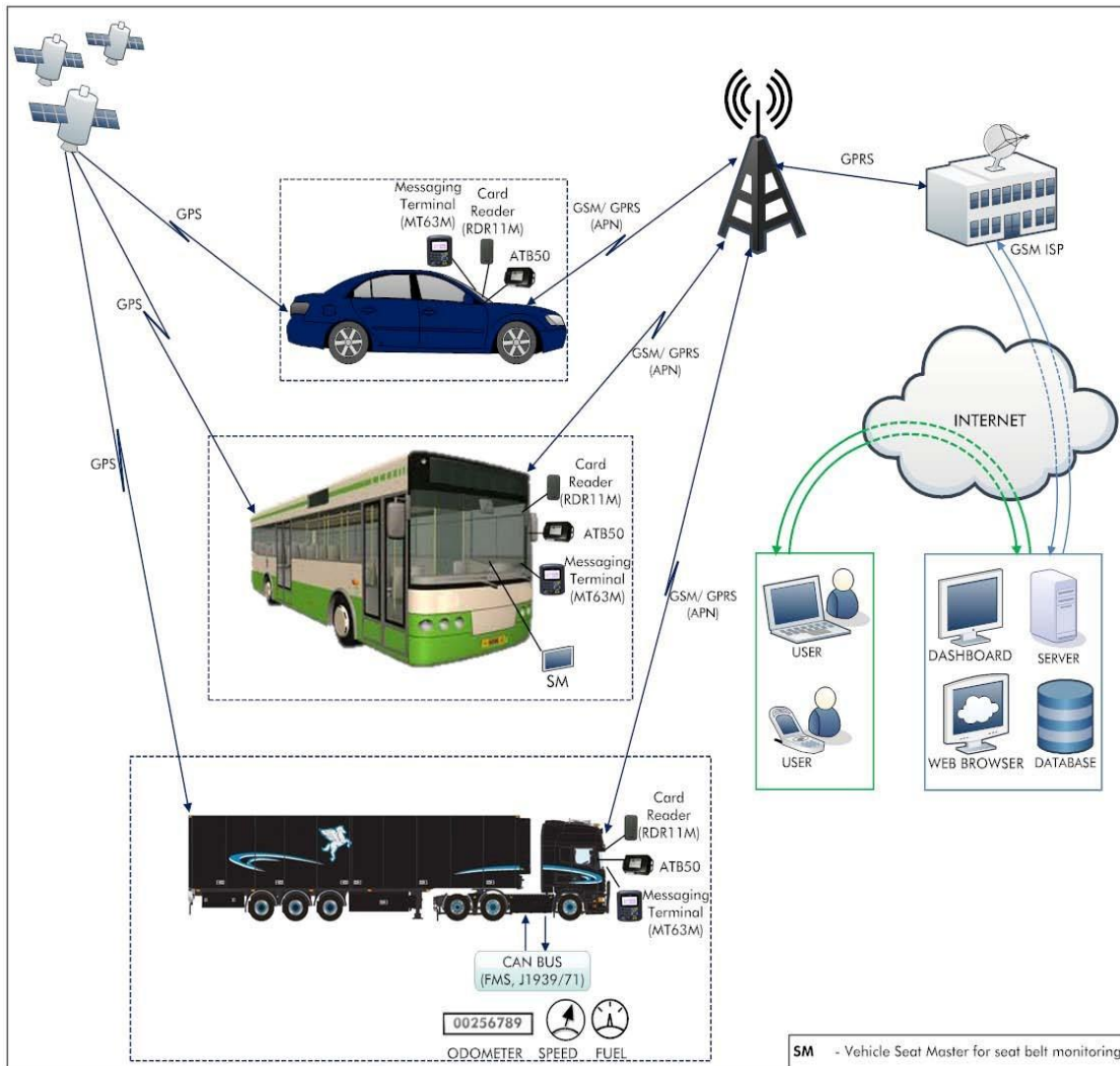


Fig 1: ATB50 System Diagram

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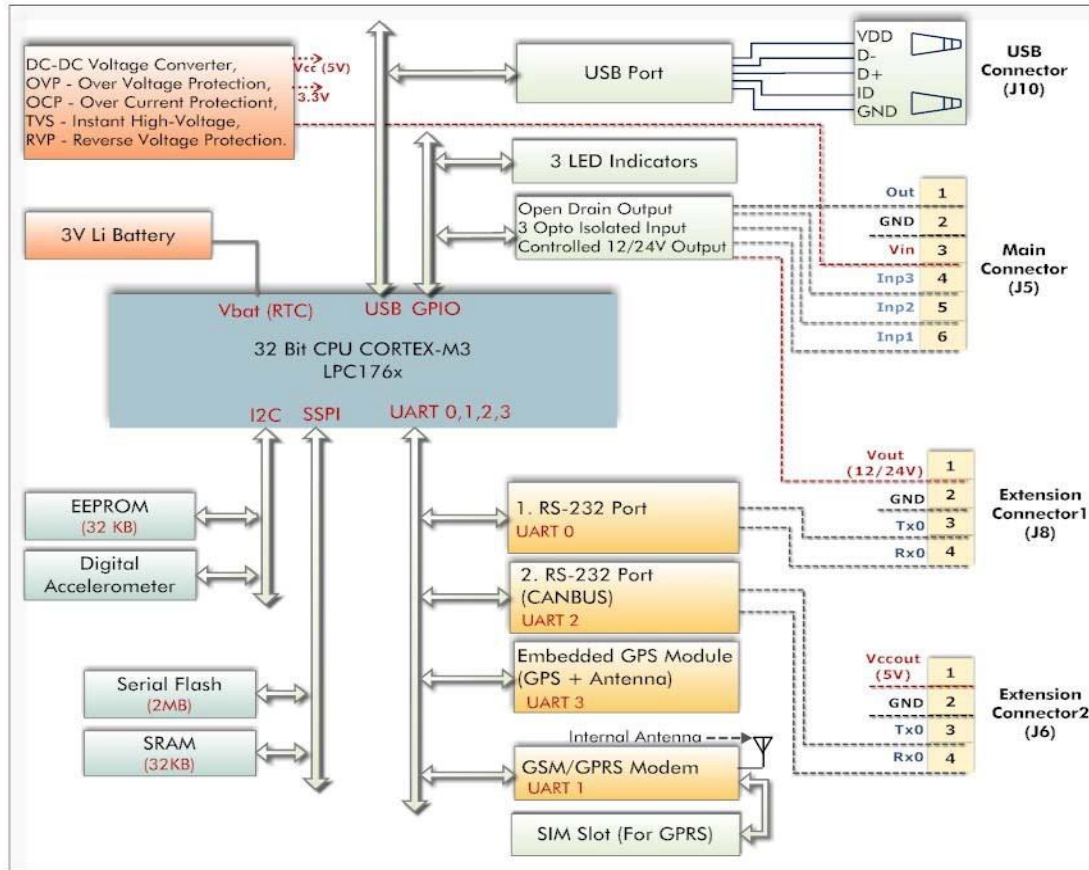


Fig 2: ATB50 Block Diagram

3. Technical Specifications

ATB50

CPU

100 MIPS CORTEX-M3
256 KBytes code memory
64 KBytes RAM

Memory :

2 MBytes flash memory (record memory)
32 KBytes battery powered RAM (holds very frequently changing data)
32 KBytes high endurance EEP (backup for RAM)

GPRS Modem :

Dual-Band GSM/GPRS
Internal PCB antenna

GPS :

MT3329 chipset, L1 frequency, up to 66 channels
Up to -165 dbm tracking sensitivity
Up to 3m position accuracy
Internal patch antenna

Communication:

2 x UART ports, RS232
CAN Bus, full J1939 support (optional)

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I/O:	1 x 1.5 A open-drain MOSFET output 3 x input, optically isolated 1 x internal ADC input, 10 bit accuracy, measuring input supply voltage (vehicle battery)
Connectors :	2x3 and 2x2 pins automotive type (with a latch)
Indicators :	1 pc. red LED and 2 pcs. GPRS modem status LEDs
RTC :	with a separate Li battery coin cell
Accelerometer:	3-axis, 12-bit, up to ± 2 g
Supply voltage :	DC 9V ... DC 30V Consumption - 13.8V / 70ma average in active mode, 13.8V / 200 μ A in sleep mode Over current, Over voltage and Load dump protection
Operating t° :	-35 C° ... 85 C°
Storage t° :	-55 C° ... 110 C°
Housing :	ABS plastic, semitransparent
Dimensions:	140 x 81 x 27 [mm]

4. Functional Specifications

- Over-The-Air (either GPRS or RF) unit configuration, maintenance and firmware update
- Large message memory buffer – up to 20000 messages
- Precisely tuned GPRS based TCP/IP socket management with advanced communication cost management
- GPRS based messaging over TCP/IP. On GPRS link loss data is stored and sent when connected
- SMS messaging (in case of GPRS loss, if configured, certain vital data could be sent with SMS)
- Various message triggering schemes and profiles • Each message includes: ○ message type (reason) ○ device identification number ○ message order no ○ hardware and software version ○ digital input/output status ○ current odometer value ○ GSM signal strength and quality ○ connected GPS satellite number ○ time stamp ○ latitude ○ longitude ○ height ○ speed information ○ direction information ○ reserved field ○ message dependent data
- Regular messages generated on elapsed time or distance base
- Vehicle start/stop detection and notification
- Engine idle status detection and notification
- Track mileage
- Driver identification/authorization (using contactless card reader, via UART)
- Two way messaging with the driver, using a terminal with LCD and keyboard (via UART)
- Engine crank inhibition (remote or depending on the driver identification)

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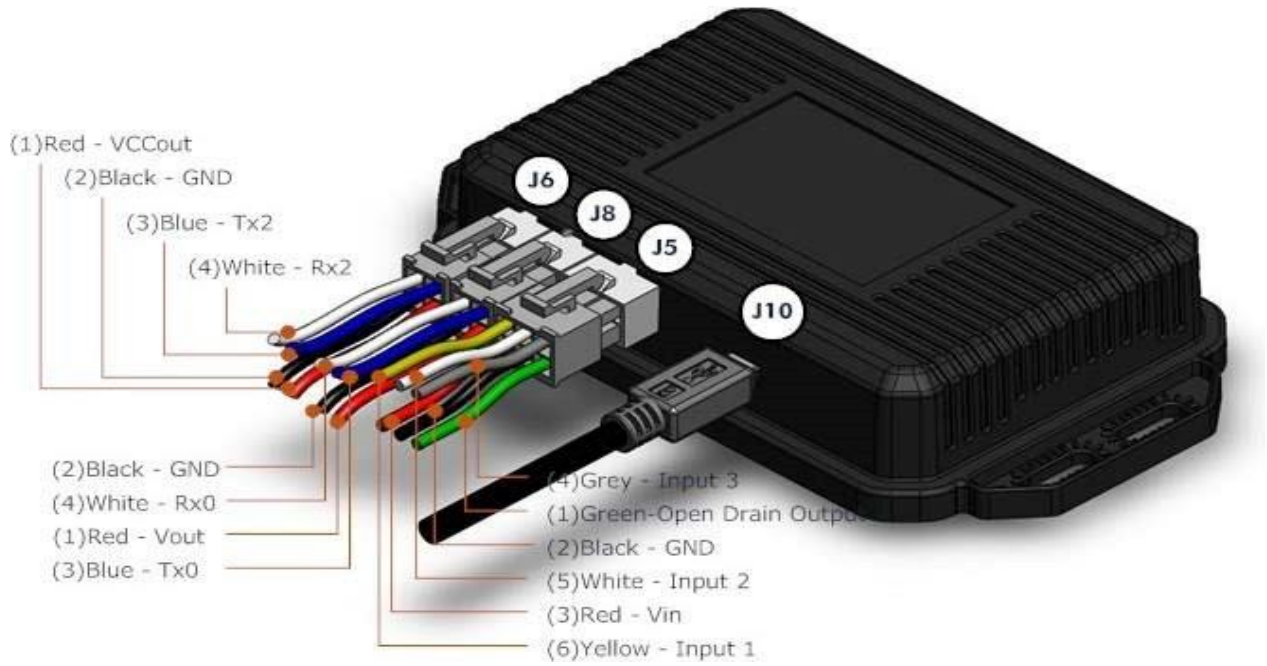
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- Voltage monitoring and vehicle battery low alert
- Unexpected deceleration or acceleration alerts with configurable thresholds (accident detection)
- Speed violation alert
- Towing alert
- CAN BUS (FMS J1939) based messages and alerts (optional)
 - fuel consumption
 - fuel level
 - mileage counter
 - engine temperature
 - ambient temperature
 - vehicle speed
 - vehicle axle weight
 - distance to service check
- Geo-fence notification or violation alert (up to 100 polygons)
- Route detection and auditing (useful in public transportation, school bus, hot cell, etc. management)

5. Connector Description



Connector Descriptions			J5 Main Connector
No	Signal	Description	
1	Output	Open drain output (max. 40VDC - 1,7A..3,4A)	
2	GND	Ground	
3	V _{IN}	Supply voltage (DC +9V ... +30V)	
4	Input3	Digital input3 (opto isolated input) (0-1V --> L, 4-30V --> H)	
5	Input2	Digital input2 (opto isolated input) (0-1V --> L, 4-30V --> H)	
6	Input1	Digital input1 (opto isolated input) (0-1V --> L, 4-30V --> H)	

Connector Descriptions			J6 Multipurpose Expansion Connector1
No	Signal	Description	
1	V _{CCout}	Uncontrolled supply voltage(DC +5V). Internally fused (200mA).	
2	GND	Ground	

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3	Tx2	RS-232 UART2/CAN1H transmit signal
4	Rx2	RS-232 UART2/CAN1L receive signal

Connector Descriptions		J8 Multipurpose Expansion Connector2
No	Signal	Description
1	V _{OUT}	Controlled PWR supply output V _{ACC} (DC 12V-24V). Four different operation mode. Internally fused (1A).
2	GND	Ground
3	Tx0	RS-232 UART0 transmit signal
4	Rx0	RS-232 UART0 receive signal

Connector Descriptions		J10 USB Connector
No	Signal	Description
1	V _{DD}	+5V
2	D-	USB bidirectional D- line.
3	D+	USB bidirectional D+ line.
4	ID	USB ID
5	GND	Ground

6. ATB50 - CAN/FMS Capabilities

CAN-bus makes possible collecting a lot of information directly from the vehicle ECU (electronic control unit), like; consumption, mileage, temperature, distance to service check ...etc. So, fleet owners can take advantage of having on hand extremely accurate information regarding many crucial vehicle parameters.

For more information:

- <http://en.wikipedia.org/wiki/Canbus>
- http://en.wikipedia.org/wiki/Fleet_Management_System - <http://en.wikipedia.org/wiki/J1939>

6.1. ATB50 - Supported Vehicles

Trademark	Model	Year	FMS	Data
Mercedes	Actros	2004 - 2010	No	- Fuel Level (0–100 %)
	Axor	2004 - 2010	No	- High Resolution Odometer Value (km.)
	Actros	2011 and later	Yes	- Vehicle Speed: (Wheel Speed)
				- Vehicle Speed: (Tachograph Speed)
				- Clutch Status (Pressed or not)
				- Brake Status (Pressed or not)
				- Cruise Control (On - Off)
				- Power Take-Off Status
				- Speed Pedal Press Rate (0-100 %)
				- Total Fuel Consumption (since manufacture)

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	-	-	Yes	- Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - (*)Axle Weight (kg.) - Engine Total Hours of Operation (since manufacture) - High Resolution Odometer Value (km.) - Service Distance (km.) - Engine Temperature (°C)
Renault	Premium	2004 +	No	- Vehicle Speed: (Wheel Speed) - Vehicle Speed: (Tachograph Speed) - Clutch Status (Pressed or not) - Brake Status (Pressed or not) - Cruise Control (On - Off) - Power Take-Off Status - Speed Pedal Press Rate (0-100 %) - (*)Total Fuel Consumption (since manufacture) - (*)Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - (*)Axle Weight (kg.)
	Magnum	2004 +	No	- Engine Total Hours of Operation (since manuf.) - High Resolution Odometer Value (km.) - (*)Service Distance (km.) - Engine Temperature (°C)
	-	-	Yes	- Vehicle Speed: (Wheel Speed) - Vehicle Speed: (Tachograph Speed) - Clutch Status (Pressed or not) - Brake Status (Pressed or not) - Cruise Control (On - Off) - Power Take-Off Status - Speed Pedal Press Rate (0-100 %) - Total Fuel Consumption (since manufacture) - Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - Axle Weight (kg.) - Engine Total Hours of Operation (since manufacture) - High Resolution Odometer Value (km.) - Service Distance (km.) - Engine Temperature (°C) - Ambient Air Temperature (°C)

Scania	-	-	No	- Vehicle Speed: (Wheel Speed) - (*)Vehicle Speed: (Tachograph Speed) - Clutch Status (Pressed or not) - Brake Status (Pressed or not) - Cruise Control (On - Off) - Power Take-Off Status - (*)Speed Pedal Press Rate (0-100 %) - (*)Total Fuel Consumption (since manufacture) - (*)Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - (*)Axle Weight (kg.) - (*)Engine Total Hours of Operation (since manuf.) - (*)High Resolution Odometer Value (km.) - (*)Service Distance (km.) - Engine Temperature (°C) - Fuel Consumption Rate (lt. / h.)
	-	-	Yes	- Vehicle Speed: (Wheel Speed) - Vehicle Speed: (Tachograph Speed) - Clutch Status (Pressed or not) - Brake Status (Pressed or not) - Cruise Control (On - Off) - Power Take-Off Status - Speed Pedal Press Rate (0-100 %) - Total Fuel Consumption (since manufacture) - Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - Axle Weight (kg.) - Engine Total Hours of Operation (since manuf.) - High Resolution Odometer Value (km.) - Service Distance (km.) - Engine Temperature (°C) - Fuel Consumption Rate (lt. / h.)
MAN	-	2004 +	No	- Vehicle Speed: (Wheel Speed) - Vehicle Speed: (Tachograph Speed) - Clutch Status (Pressed or not) - Brake Status (Pressed or not) - Cruise Control (On - Off) - Power Take-Off Status - Speed Pedal Press Rate (0-100 %) - Total Fuel Consumption (since manufacture) - Tank Fuel Level (0-100 %) - Engine Rotation Speed (RPM) - Axle Weight (kg.) - Engine Total Hours of Operation (since manuf.)
	-	-	-	- Engine Total Hours of Operation (since manuf.)

	-	-	Yes	-	High Resolution Odometer Value (km.) Service Distance (km.) Engine Temperature (°C) Fuel Consumption Rate (lt. / h.) Ambient Air Temperature (°C)
IVECO	-	2004 +	No	-	Vehicle Speed: (Wheel Speed) Vehicle Speed: (Tachograph Speed) Clutch Status (Pressed or not) Brake Status (Pressed or not) Cruise Control (On - Off) Power Take-Off Status Speed Pedal Press Rate (0-100 %) Total Fuel Consumption (since manufacture) Tank Fuel Level (0-100 %)
	-	-	Yes	-	Engine Rotation Speed (RPM) Axle Weight (kg.) Engine Total Hours of Operation (since manuf.) High Resolution Odometer Value (km.) Service Distance (km.) Engine Temperature (°C) Fuel Consumption Rate (lt. / h.)
Volvo	-	-	Yes	-	Vehicle Speed: (Wheel Speed) Vehicle Speed: (Tachograph Speed) Clutch Status (Pressed or not) Brake Status (Pressed or not) Cruise Control (On - Off) Power Take-Off Status Speed Pedal Press Rate (0-100 %) Total Fuel Consumption (since manufacture) Tank Fuel Level (0-100 %) Engine Rotation Speed (RPM) Axle Weight (kg.) Engine Total Hours of Operation (since manuf.) High Resolution Odometer Value (km.) Service Distance (km.) Engine Temperature (°C)
DAF	-	-	Yes	-	Vehicle Speed: (Wheel Speed) Vehicle Speed: (Tachograph Speed) Clutch Status (Pressed or not) Brake Status (Pressed or not) Cruise Control (On - Off)
				-	Power Take-Off Status Speed Pedal Press Rate (0-100 %) Total Fuel Consumption (since manufacture) Tank Fuel Level (0-100 %)

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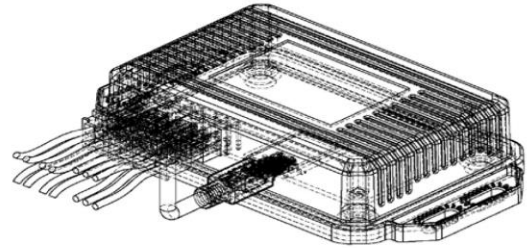
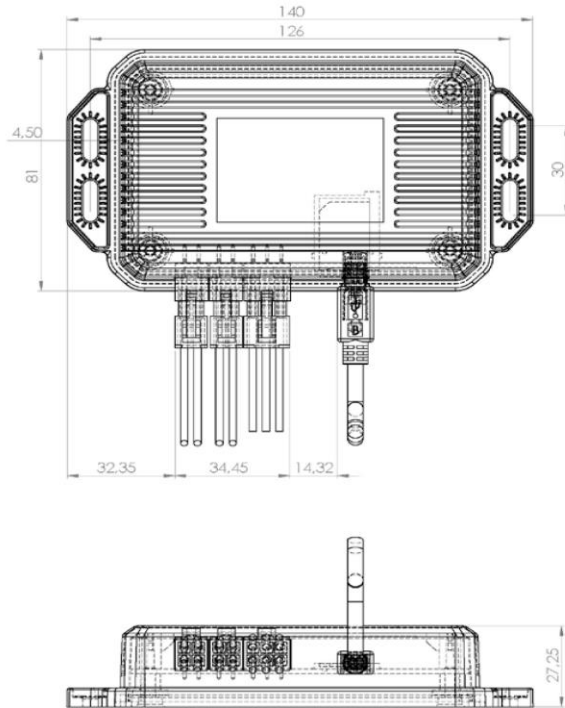
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				- Engine Rotation Speed (RPM) - Axle Weight (kg.) - Engine Total Hours of Operation (since manuf.) - High Resolution Odometer Value (km.) - Service Distance (km.) - Engine Temperature (°C) - Fuel Consumption Rate (lt. / h.)
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(*)Availability of this information should be consulted to manufacturer.

7. Mechanical Drawings



8. Accessories

- **MT63M** – Two way messaging terminal
 - 128x64 dots LCD
 - keyboard
 - contactless reader (driver identification with a mifare card)
- **RDR11M** - Driver identification with a mifare card