



RA CONSULTING

Embedded Diagnostic Systems

DiagRA - Embedded

To Log and Retrieve Diagnostic Data from Vehicles during Road Testing.

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Embedded Diagnostic Systems

Hardware:-

- to Log Vehicle Data**
- to Send Data to an Office Server**
- to Receive new Configurations**

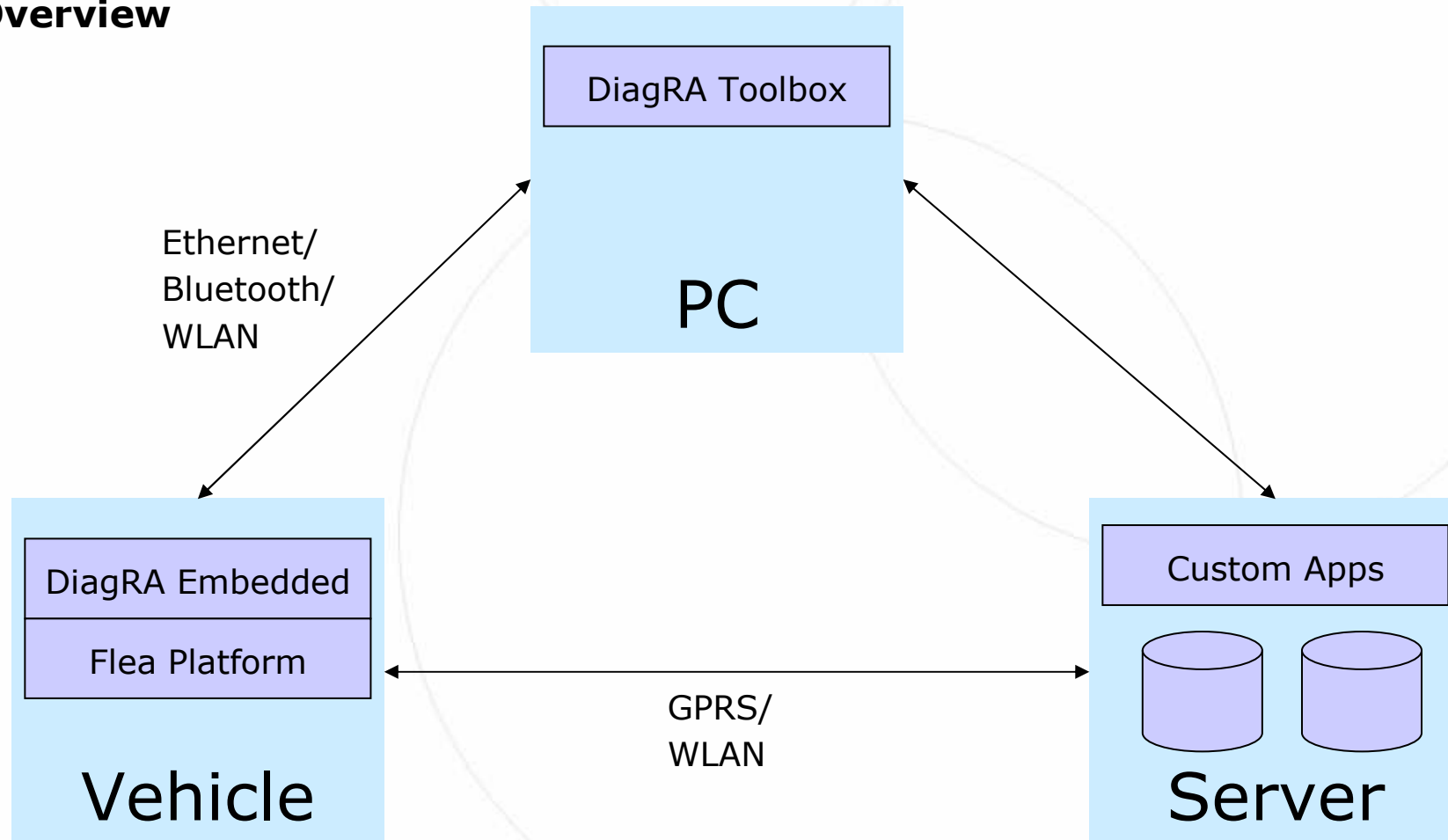
Software:-

- to Configure Diagnostic Tasks**
- to Execute Tasks**
- to Upload Captured Data**
- to Download Configurations**
- to Display Results**
- to Provide a J2534 Programming Interface**



Embedded Diagnostic Systems

Overview





Embedded Diagnostic Systems

Hardware:- To Log Vehicle Data

CAN and K Line Diagnostic Interfaces:-

- **OBD2**
- **ISO 15765**
- **VW TP2.0**
- **ISO 14230**
- **ISO 9141**
- **UDS by end of 2008**
- **Raw CAN**



Embedded Diagnostic Systems

Hardware:- To Send Data and Receive Configurations

Communication Interfaces:-

- **GPRS**
- **Ethernet**
- **Wireless LAN**
- **BlueTooth**



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Software:- To Configure Diagnostic Tasks

- **To Select a Diagnostic Protocol**
- **To Select ECU Addresses**
- **To Get Vehicle VIN**
- **To Specify Trigger Conditions**

e.g. On CAN frame

On CAN Data Values by Equation (AND, OR, > etc)

Post Trigger Time

On DTC becoming set

- **To Specify Task Scheduling**



Embedded Diagnostic Systems

Software:- To Execute Tasks

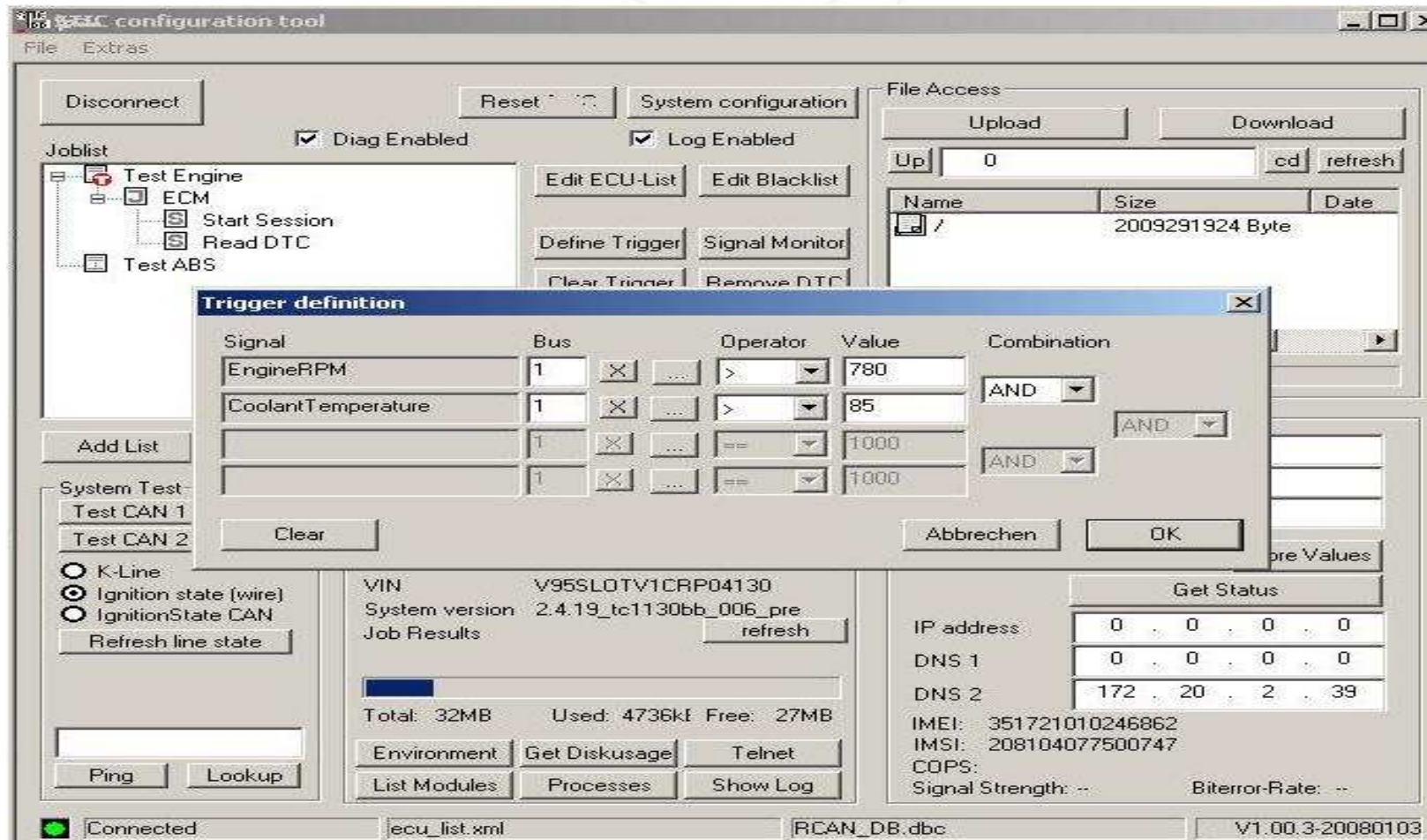
OnBoard Task Manager

Schedules Tasks:

- **Sequentially**
- **By Time of Day**
- **At Specified Time Intervals**
- **At Start Up**
- **At Shut Down**
- **To Upload Data**
- **To Download Configurations**

Embedded Diagnostic Systems

Configuration Tool



The screenshot displays the ECUC configuration tool interface. A 'Trigger definition' dialog box is open, showing the following configuration:

Signal	Bus	Operator	Value	Combination
EngineRPM	1	>	780	AND
CoolantTemperature	1	>	85	
	1	==	1000	AND
	1	==	1000	

The main interface includes a 'Joblist' tree with 'Test Engine' selected, containing 'ECM', 'Start Session', and 'Read DTC'. Other visible elements include 'System configuration', 'File Access' (Upload/Download), 'System Test' (Test CAN 1, Test CAN 2), and 'Refresh line state'. The status bar at the bottom shows 'Connected', 'ecu_list.xml', 'RCAN_DB.dbc', and 'V1.00.3-20080103'.



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Software:- To Upload Log Files To Server

Data Clearing Centre (Dcc)

- **Receives data over GPRS or Wireless LAN**
- **Stores Data by VIN**
- **Notification by email**



Embedded Diagnostic Systems

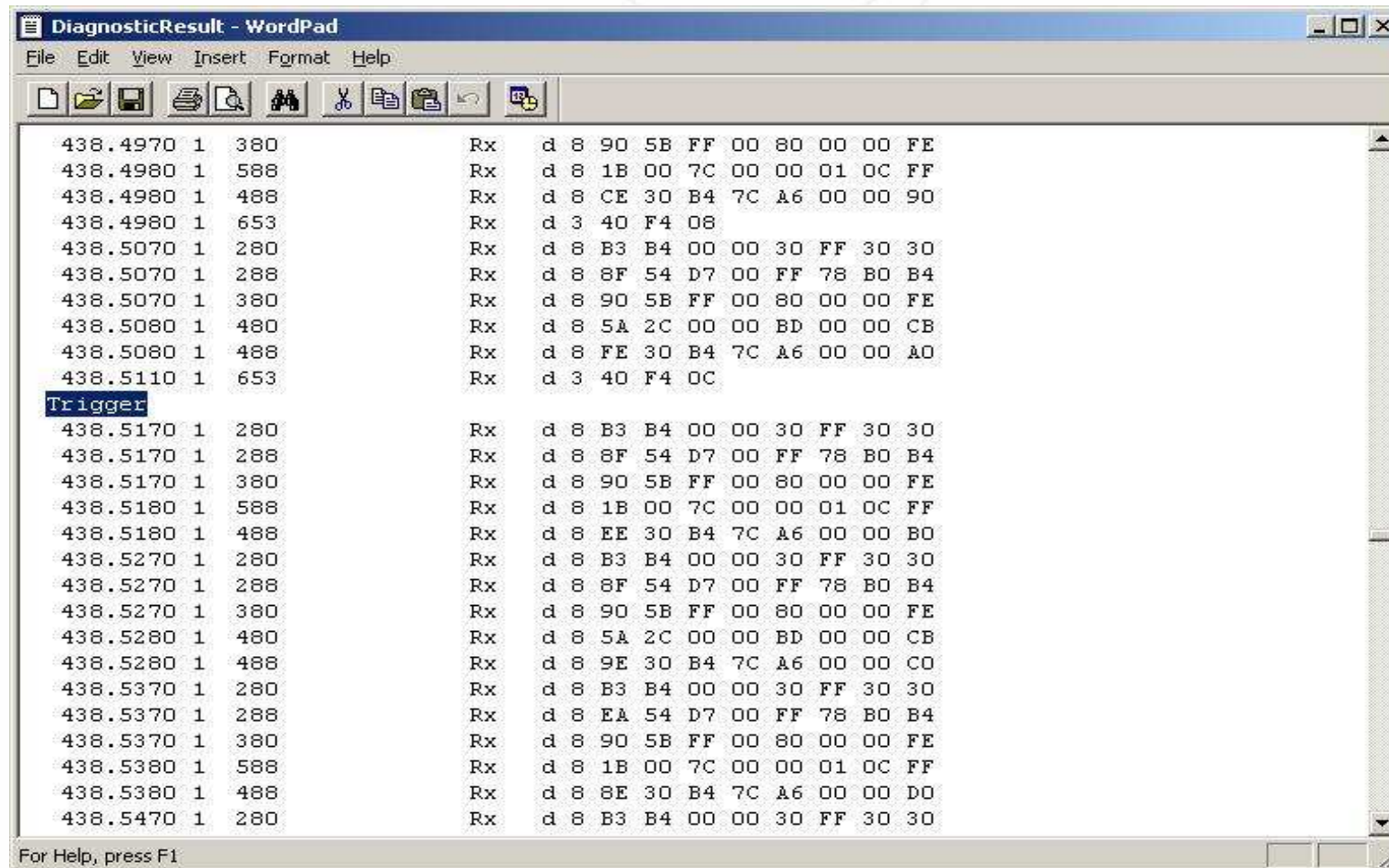
Software:- To Display Results

DccWeb Monitor

- **Web access**
- **Raw data display**
- **Text or XML display**
- **Interface to user written applications**

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Display Raw CAN Data



```

DiagnosticResult - WordPad
File Edit View Insert Format Help
[Icons]
438.4970 1 380 Rx d 8 90 5B FF 00 80 00 00 FE
438.4980 1 588 Rx d 8 1B 00 7C 00 00 01 0C FF
438.4980 1 488 Rx d 8 CE 30 B4 7C A6 00 00 90
438.4980 1 653 Rx d 3 40 F4 08
438.5070 1 280 Rx d 8 B3 B4 00 00 30 FF 30 30
438.5070 1 288 Rx d 8 8F 54 D7 00 FF 78 B0 B4
438.5070 1 380 Rx d 8 90 5B FF 00 80 00 00 FE
438.5080 1 480 Rx d 8 5A 2C 00 00 BD 00 00 CB
438.5080 1 488 Rx d 8 FE 30 B4 7C A6 00 00 A0
438.5110 1 653 Rx d 3 40 F4 0C
Trigger
438.5170 1 280 Rx d 8 B3 B4 00 00 30 FF 30 30
438.5170 1 288 Rx d 8 8F 54 D7 00 FF 78 B0 B4
438.5170 1 380 Rx d 8 90 5B FF 00 80 00 00 FE
438.5180 1 588 Rx d 8 1B 00 7C 00 00 01 0C FF
438.5180 1 488 Rx d 8 EE 30 B4 7C A6 00 00 B0
438.5270 1 280 Rx d 8 B3 B4 00 00 30 FF 30 30
438.5270 1 288 Rx d 8 8F 54 D7 00 FF 78 B0 B4
438.5270 1 380 Rx d 8 90 5B FF 00 80 00 00 FE
438.5280 1 480 Rx d 8 5A 2C 00 00 BD 00 00 CB
438.5280 1 488 Rx d 8 9E 30 B4 7C A6 00 00 C0
438.5370 1 280 Rx d 8 B3 B4 00 00 30 FF 30 30
438.5370 1 288 Rx d 8 EA 54 D7 00 FF 78 B0 B4
438.5370 1 380 Rx d 8 90 5B FF 00 80 00 00 FE
438.5380 1 588 Rx d 8 1B 00 7C 00 00 01 0C FF
438.5380 1 488 Rx d 8 8E 30 B4 7C A6 00 00 D0
438.5470 1 280 Rx d 8 B3 B4 00 00 30 FF 30 30
For Help, press F1
  
```



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Vehicle Selection

The screenshot shows the 'DccWebMonitor' interface. On the left, there is a navigation menu with 'Supervision' and 'Change Password'. The main area is titled 'Vehicle Supervision' and contains a table of vehicles. The table has four columns: VIN, OBU-SN, SIM INFO, and Latest Event. The data rows show seven demo vehicles with VINs from 0001 to 0007, OBU-SNs from 10000000001 to 10000000007, SIM INFOs from DCC_DEMO_SIM_0001 to DCC_DEMO_SIM_0007, and latest event timestamps from 2008-04-04 17:40:12.0 to 2008-04-04 17:40:09.0.

VIN	OBU-SN	SIM INFO	Latest Event
DCC_DEMO_VIN_0001	10000000001	DCC_DEMO_SIM_0001	2008-04-04 17:40:12.0
DCC_DEMO_VIN_0002	10000000002	DCC_DEMO_SIM_0002	2008-04-04 17:40:06.0
DCC_DEMO_VIN_0003	10000000003	DCC_DEMO_SIM_0003	2008-04-04 17:40:06.0
DCC_DEMO_VIN_0004	10000000004	DCC_DEMO_SIM_0004	2008-04-04 17:40:08.0
DCC_DEMO_VIN_0005	10000000005	DCC_DEMO_SIM_0005	2008-04-04 17:40:08.0
DCC_DEMO_VIN_0006	10000000006	DCC_DEMO_SIM_0006	2008-04-04 17:40:08.0
DCC_DEMO_VIN_0007	10000000007	DCC_DEMO_SIM_0007	2008-04-04 17:40:09.0

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Data Selection

The screenshot displays the CarMediaLab DccWebMonitor interface. The top left corner features the CarMediaLab logo. The main title is 'DccWebMonitor'. Below the title, there is a navigation menu with 'Supervision' and 'Change Password' options. The central content area is titled 'Diagnostic Results' and includes a sub-header 'Vehicle' with the VIN 'DCC_DEMO_VIN_0001'. Below this, a 'Results' section contains a table of diagnostic data.

Nr.	DATE	Downloads
0.	Fri Apr 04 17:40:12 CEST 2008	
1.	Fri Apr 04 17:40:12 CEST 2008	
2.	Fri Apr 04 17:40:12 CEST 2008	
3.	Fri Apr 04 17:40:11 CEST 2008	
4.	Fri Apr 04 17:40:10 CEST 2008	
5.	Fri Apr 04 17:40:10 CEST 2008	
6.	Fri Apr 04 17:40:09 CEST 2008	
7.	Fri Apr 04 17:40:06 CEST 2008	

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Display OBD2 Diagnostic Data

```
DiagRA_D_001 - WordPad
File Edit View Insert Format Help
Scan-Tool Mode 1 - Current powertrain diagnostic data
-----
10 ECM-Engine Control Module
PID 01      1000 0111  MIL on, 7 fault code entries
      0000 0110
      1000 0000
      0000 0000  Monitor status since DTCs cleared
      Misfire monitoring not supported
      Fuel system monitoring supported and complete
      Comprehensive component monitoring supported and complete
      Catalyst monitoring not supported
      Heated catalyst monitoring not supported
      Evaporative system monitoring not supported
      Secondary air system monitoring not supported
      A/C system refrigerant monitoring not supported
      Oxygen sensor monitoring not supported
      Oxygen sensor heater monitoring not supported
      EGR and/or VVT system monitoring supported and complete
PID 04      17.4 %    Calculated load value
PID 05      86 °C    (Value = FF) Engine coolant temperature
PID 0B      0 kPa    Intake manifold absolute pressure
PID 0C      0 1/min  Engine speed
PID 0D      0 km/h   Vehicle speed
PID 0F      21 °C    (Value = FF) Intake air temperature
PID 10      0.00 g/s Air flow rate from mass air flow sensor
PID 11      0.0 %    (Value = FF) Absolute throttle position
-----
For Help, press F1
```




Embedded Diagnostic Systems

Software:- To Download Configurations

Configuration Manager

- **Sends new configurations over GPRS or Wireless LAN**

Embedded Diagnostic Systems

Hardware:

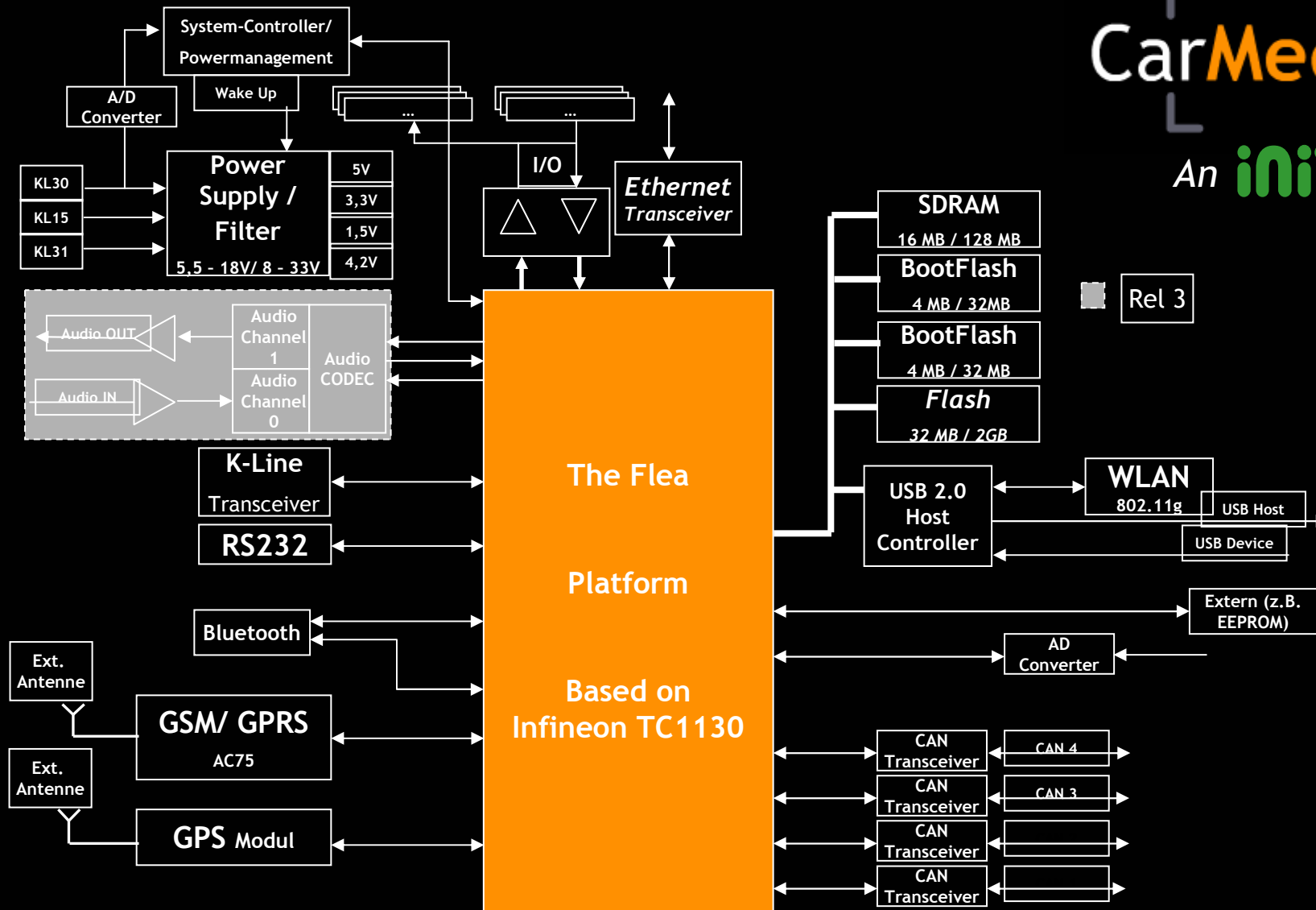
Processor	32bit, Infineon Tricore TC1130, 150 MHz
Memory	16-64MB SDRAM, 4-64MB Boot Flash, up to 2GB Flash
Connectivity	1x Fast Ethernet, GSM/ GPRS (Quad), BT, GPS, optional WLAN
Interfaces, external	1x RS232, 1x K-Line, 4x CAN, 2x USB
Interfaces, internal	1x USB
OS	Embedded Linux





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