


» Venturo Vehicle Management System «



for Transportation applications

- » On-board Vehicle System
- » Rugged, Shock & Vibration proof
- » EN50155 Compliant &  Certified

» Subsystems

The Venturo Light Rail/Road Vehicle Management System hardware proposed and manufactured by Kontron is composed of the following subsystems installed on board of the vehicle:

1. The Venturo CBox - Central Management Computer - is the heart of the system.

It can be used for all central computing task like data collection and distribution, fleet management, routing, ticket printing, and passenger information.

It provides various serial, network and wireless interfaces to allow data exchange between on board and external devices.

2. The Venturo HMI - Driver Human Maschine Interface - is a device making the link between the CBox and the vehicle driver.

It is equipped with an 8.4" color display covered by a touchscreen allowing data entries / acknowledges / selections by the driver.

The Venturo HMI also contains two peripherals:

- » one ticket printer for the fare printing
- » one large Vacuum Fluorescent 2-lines alphanumeric display oriented to the passenger to show him valuable information (e.g.the due fare).

3. The optional Venturo RFID contactless badge reader allows reading of encoded cards according Mifare® DESFIRE (compliant with ISO14443A, ISO15693, ISO 18000-3, NFC enabled, ICODE).

It is provided with two card slots secured against ejection due to shocks and vibrations.

It is capable of simultaneous reading of two cards without interference and is accepting the permanent presence of the cards in the reader slots without damage for the card and for the reader.

4. As a safety accessory, the Venturo GBox (GSM-Voice & Audio) is an independent quad band (850/900/1800/1900 MHz) device capable of storing and running JAVA applications.

It's purpose is to establish an automatic voice communication link between the vehicle and the ground station in case of activation of the "emergency button" or the "distress button" which are connected to the Venturo GBox via 2 isolated digital inputs.

It is provided with a serial RS422 communication link allowing connection with the central board computer CBox and with 2 isolated digital outputs.

It is also provided with a GSM-controlled audio switch bank including:

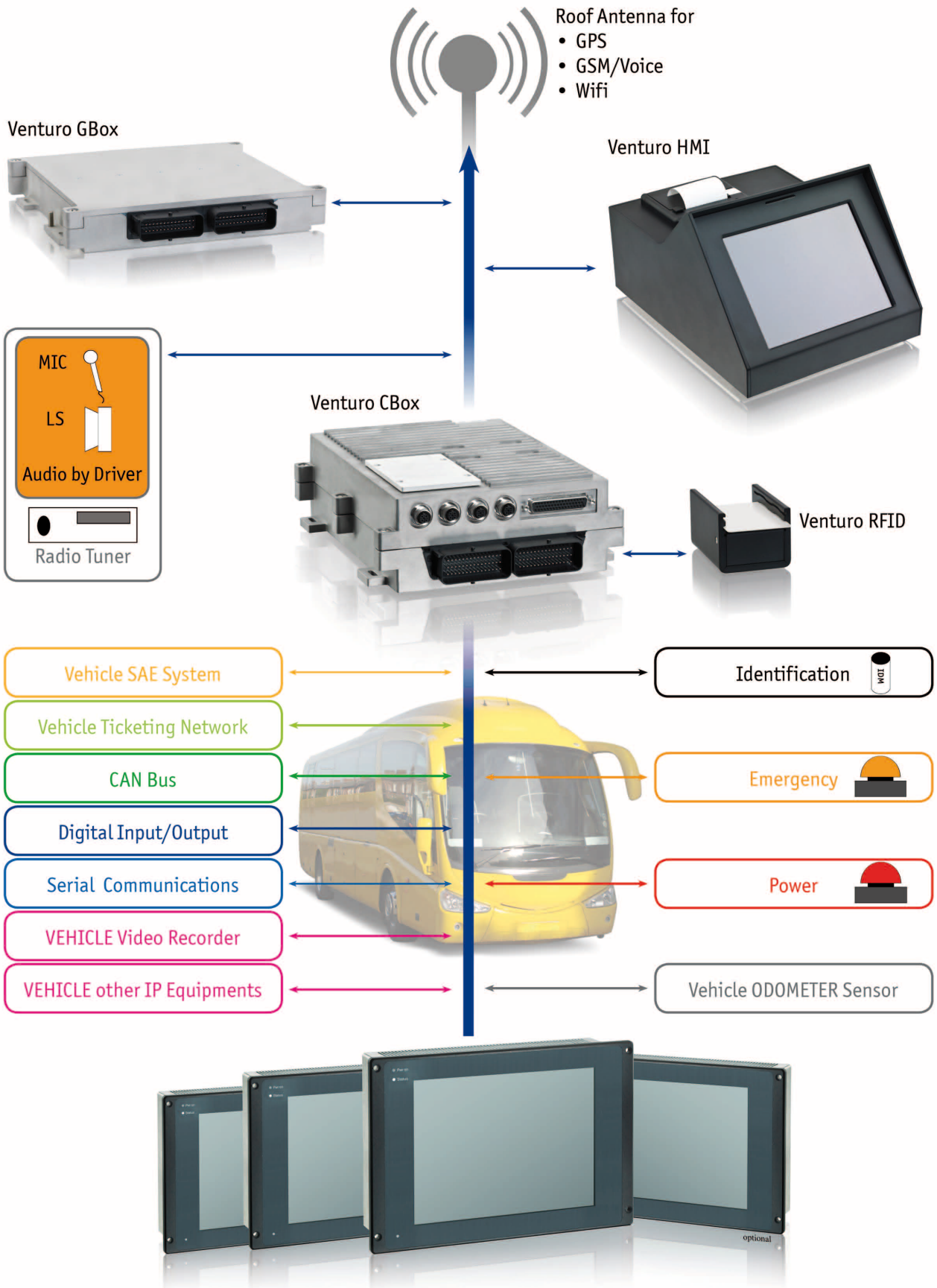
- » 2 microphone inputs
- » 3 line inputs (one internal for the GSM)
- » 2 line outputs (one internal for the GSM)
- » 1 amplified speaker output (5W)

This feature allows e.g. audio in/out to the driver's cab, audio in/out to the passenger compartment, audio in the vehicle radio.

5. The optional Vehicle Identification Memory which contains unique identification of the vehicle and of it's configuration.

6. The roof antennas:

- » one GSM antenna associated to the Venturo GBox
- » one 3-bands antenna associated to the GSM, GPS and WiFi modules contained in the central board computer Venturo CBox.



» Venturo CBox

Technical Information

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| Processor and related | <p>KONTRON nanoETXexpress-SP board with:</p> <ul style="list-style-type: none"> » processor Intel® Atom™ Z510 1.1 GHz (Z530 1.6 GHz under request) » Intel® System Controller SCH US15W » Gbit LAN » 32kB Instruction cache + 24kB L1 cache + 512kB L2 cache » 1GB onboard soldered DDR2 SDRAM » 512MB onboard soldered Flash (up to 4GB under request) » Integrated Intel® Graphics, HDTV/HD capable, Decoder for MPEG2(HD)/H.264 » High definition Audio <p>PCI bridge & Audio codec</p> |
| Internal SATA Interface | Internal SATA connector for optional SATA 2,5" mass storage device (e.g. HDD automotive or Solid State Drive). The storage device is not provided, choice must be defined at time of order. |
| Ethernet Switch | Internal Ethernet switch (not manageable) avoiding the need to add an external Ethernet switch in the vehicle. Provides 4 x isolated Ethernet 10/100 MBit/s channels on M12 D-coded female connectors |
| GPS | <p>Internal GPS with associated gyroscopic sensors and odometric information providing high performance dead reckoning positioning.</p> <p>Allows mounting in different positions.</p> <p>Connection to external antenna through SMA female connector allows the use of both amplified or passive external antenna.</p> <p>Specific input for the vehicle Odometric sensor connection</p> |
| HsxPA / UMTS / GPRS / EDGE Option | Internal module providing UMTS with HsxPA (HSDPA cat 8, HSUPA cat 5 upgradeable) EDGE/GPRS MS class 12, (3G) with SIM card holder/socket accessible through the Service Panel. Connection to external antenna through SMA female connector. This function is not included per default and may be ordered separately as option. |
| WiFi Option | Internal Wi-Fi module providing IEEE 802.11/abg (5,6 GHz and 2,4GHz) wireless communication. Connection to external antenna through SMA female connector. This function is not included per default and may be ordered separately as option. |
| Vehicle Bus | Internal isolated CAN bus Railways EN50155 compliant, SJA1000 based |
| Serial communications interfaces | <p>12 Isolated Railways EN50155 compliant serial ports:</p> <ul style="list-style-type: none"> » 3 x RS485 » 5 x RS232 » 2 x software selectable RS422/RS485 » 2 x RS422 <p>4 not isolated RS232 serial ports</p> <p>Isolated IBIS (slave) port under request</p> |
| Digital I/O interfaces | Isolated Railways EN50155 compliant digital I/O interfaces, 24Vdc, over-voltage and transients protected: <ul style="list-style-type: none"> » 8 x digital inputs and 4 x digital outputs |
| Display interface | LVDS 18 bits (up to 1024x768) /T°C for remote display connection |
| Power Supply input & output | <p>Designed to be powered from the battery of the vehicle</p> <p>Nominal voltage: 24Vdc, operating range: according EN50155 standard</p> <p>Accept interruptions up to 10ms (compliant EN50155 class S2)</p> <p>Protected against polarity inversion, overvoltage, transients and surges</p> <p>Provide auxiliary power of 24Vdc / 15 W to feed auxiliary equipment(s)</p> |
| Power on/off management system | Power Management System for graceful start up and shutdown |
| Service panel | <p>Managed at top of the housing, allows easy accessibility to the following:</p> <ul style="list-style-type: none"> » One maintenance port USB 2.0 with USB connector type A » One VGA port with D-Sub 15 connector (same video signals as LVDS) » The RTC battery backup holder (no battery provided, battery type CR2450 or equivalent (560mAh) » Reset push button » The "SIMcard" holder connector connected to GSM MiniPCI Express slot. |
| Environment | <p>Fanless System</p> <p>Operating temperature range -25°C to +60°C. Extended temperature range optional.</p> <p>MTBF > 80.000 hrs</p> <p>Compliant with Railways Standards EN50155 and associated.</p> |
| Mechanical | <p>Aluminium housing IP54 with bottom lateral fixing brackets and service panel at top, provided with following connectors:</p> <ul style="list-style-type: none"> » 1 x automotive IP68 90 poles rectangular male » 4 x M12 D-coded female » 1 x D-SUB female » 3 x SMA (RF) female <p>Housing dimensions (LxWxH mm): 250 x 226mm x 83mm (connectors and fixing brackets not included) Weight: 5.5 kg</p> |

» Venturo GBox

Technical Information

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| GSM | <p>Internal module offering embedded JAVA™ processing based on a state-of-the-art ARM 9 processor architecture.</p> <ul style="list-style-type: none"> » "IP Ready" core using AT command set and PPP link » Data transfer using GPRS Multi-slot Class 12 device » SMS over CSD or GPRS and Fax Group 3, class 1 » 2 x digital inputs I/O lines » 1 x RS422 control line <hr/> <p>Internal SIM card holder socket</p> <hr/> <p>Connection to external GSM/GPRS antenna through SMA female connector.</p> |
| Serial Communications interfaces | <p>1 x Isolated Railways EN50155 compliant serial port RS422 internally connected to the GSM module (control line)</p> |
| Digital I/O interfaces | <p>Isolated Railways EN50155 compliant digital I/O interfaces, 24Vdc, over-voltage and transients protected:</p> <ul style="list-style-type: none"> 2 x DI internally connected to the GSM module 2 x DI + 2 x DO general purpose inputs |
| Power Supply input | <p>Designed to be powered from the battery of the vehicle</p> <hr/> <p>Nominal voltage: 24Vdc, operating range: according EN50155 standard</p> <hr/> <p>Accept interruptions up to 10ms (compliant EN50155 class S2)</p> <hr/> <p>Protected against polarity inversion, overvoltage, transients and surges</p> |
| MCG/DAS version only | <p>An Internal Audio Bank Switch (selector) is provided which contains a Logic Controller device in communication with the internal GSM module in which a JAVA application is running.</p> <hr/> <p>All the audio IN/OUT channels are electrically isolated and impedance adapted.</p> <hr/> <p>The audio cross-connections (patches) between the GSM lines IN & OUT and the user's audio channels IN & OUT are set by the Logic Controller device according and internal Audio Routing Table (see example below):</p> <hr/> <p>A watchdog supervisory system is provided by the internal Logic Controller device. It can be refreshed by the JAVA application as well as by the serial communication control line. In case of watchdog time-out the Audio Bank Switch can be automatically set in a pre-defined configuration</p> <hr/> <p>The user's audio in/out channels are:</p> <ul style="list-style-type: none"> » 2 x microphone inputs MIC1 & MIC2 (e.g. connected in the vehicle to the driver's microphone and to the ambience microphone) » 2 x Line-IN (AUX1 & AUX2) (e.g. connected in the vehicle to the Board Computer audio) » 2 x Line-OUT (OUT1 & OUT2) (e.g. connected in the vehicle to the ambience audio and the radio) » 1 x Loudspeaker output delivering up to 5 Watts RMS power (e.g. connected in the vehicle to a loudspeaker beside the driver) |
| Environment | <p>Fanless operating temperature range -30°C to +70°C</p> <hr/> <p>Compliant with Railways Standards EN50155 and associated</p> |
| Mechanical | <p>Aluminium housing IP54 with bottom lateral fixing brackets</p> <p>Provided with one automotive IP68 56 poles rectangular male connector and one SMA (RF) female</p> <p>Housing dimensions (LxWxH mm): 245 x 207 mm x 37mm (connectors and fixing brackets not included)</p> <p>Weight: 3 kg</p> |

» Venturo HMI

Technical Information

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| Graphic Display | Antiglare 8,4" 800x600 screen positioned in landscape 262K colors, luminance 400 cd/m ² typ, contrast ratio 1000:1 typ Viewing angles typ: 80° Right /80° Left / 80° Up /80° Down Response time: typ: 3ms white to black / 15ms black to white Equipped with protection cap against direct sunlight from windscreen Equipped with front luminosity sensor Equipped with front led's for "Power supply on" & "LVDS signal present" Backlight control and sleep mode supervised by the CBox LVDS & I ² C input for image display TFT operating temperature range : -30°C to +85°C (at panel surface) |
| Touchscreen | 4 Wires resistive touchscreen antiglare Communication with the CBox: serial RS422/485 |
| Ticket printer | Thermal line dot printing with paper roll near end detection Paper width: 58mm (Maximum paper roll diameter: 45mm) Easy paper replacement (use of paper roll without core) High printing speed up to 90 mm/s Dot composition / line: 384, Printing resolution: 8 dots (203 dpi) European standard PC347 and Cyrillic PC866 character tables. Optional: Arabic ISO8859-6 character table Command list compatible to Epson/POS™ protocol 12x24 and 8x16 dot sizes Complex graphic bitmap printing EAN13, CODE 39, CODE 128 and IFT barcode formats Self-test & configuration modes Rugged for automotive use and independently replaceable printer mechanism Communication with the MCC: serial RS422/485 |
| Fare display | High readability Vacuum Fluorescent Display Brightness: 350 to 700cd/m ² , viewing angle: 90° Two lines of 20 characters each Character size: 5x7 dot matrix, 9,03mm high x 5,25 mm width Character types: 95 alphanumeric, 32 international, 9 user' defined Point-to-point dot addressing for "simple images" display (eg logo) Supports 10 command modes included Epson command Self test function Communication with the CBox: serial RS422/485 |
| Power supply input | Nominal voltage: 24Vdc, operating range according EN50155 standard |
| Environment | Fanless operating temperature range 0°C to +50°C (limited by the printer unit) |
| Mechanical | Rugged shocks/Vibrations proof IP64 enclosure with exception of the printer Single connector mounted "hidden" at bottom of the Driver's Display Housing dimensions (LxWxH mm): 245 x 207 mm x 37mm (connectors and fixing brackets not included) Weight: 3 kg |

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