VEHICLE DATA INTERFACES

MasterCAN CC

MasterCAN V-GATE

MasterCAN C 232/485

SK MasterCAN

OPERATION MANUAL
(including Service MasterCAN software manual)

Version 4.0
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## Revision history

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<td>1.0</td>
<td>01.2013</td>
<td>OD</td>
<td>Basic version.</td>
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<tr>
<td>4.0</td>
<td>01.2017</td>
<td>OD</td>
<td>- New design of output connectors for all models of MasterCAN.</td>
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<td>- MasterCAN scheme of connection to terminal changed.</td>
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<td>- Delivery set of MasterCAN and SK MasterCAN changed.</td>
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<td>- S6 SK service kit can now be used for MasterCAN configuration.</td>
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<td>- MasterCAN connection to PC is changed and amended.</td>
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<td>- MasterCAN V-gate connection parameters are clarified.</td>
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<td>- MasterCAN data transfer protocol is amended.</td>
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<td>- Terms and definitions are updated.</td>
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Terms and Definitions

**S6** — is the vehicle onboard data bus developed by [JV Technoton](http://s6.jv-technoton.com/en/) to enable integrating the GPS/GLONASS-based vehicle monitoring system into the vehicle electrical equipment. It comprises a set of cables, interfaces and protocols. Physically, it is based on CAN 2.0B (ISO 11898-1:2003) and K-Line (ISO 9141). S6 bus data exchange protocol complies with SAE J1939 International Standard.


**Telematics Interface S6 operation manual** contains guidelines and rules which refer to S6 cabling system, S6 SK service kit and service software for S6 Telematics Interface

**PGN** (Parameter Group Number) — is a combined group of S6 parameters, which has common name and number. Functional Modules (FM) of the Unit can have input/output PGNs and setup PGNs.

**SPN** (Suspect Parameter Number) — informational unit of S6. Each SPN has determined name, number, extension, data type and numerical value. The following types of SPN exist: Parameters, Counters, Events. SPN can have a qualifier which allows qualification of parameter’s value (e.g. – Onboard power supply limit/Minimum).

**J1708** is a digital bus-type interface. Bus J1708 is used in some modern vehicles to transmit and exchange data between the engine controller and other electronic devices. The level of data presentation complies with SAE J1587 International Standard.

**FMS** are data packets of vehicles’ digital onboard interfaces (further on vehicles) that comply with the document FMS-Standard Interface Description (further on — FMS-Standard).

**FMS-Standard** is an open FMS Interface Standard developed by world leading truck manufacturers.


**Telematics** — special set of telematics messages developed by Technoton. Meets requirements of SAE J1939/71 standards. Telematics messages contain important operation parameters of vehicle.

**Onboard equipment** (OE) — Telematics System Elements, directly installed in vehicle.

**Telematics terminal** (Tracking device) is a unit of Telematics System used for reading the signals of Vehicle standard and additional sensors, getting location data and transmitting the data to the Server.

**Telematics system** — complex solution for real-time and after trip vehicle monitoring and control. Main vehicle parameters monitored: route, fuel consumption, operation time, technical condition of vehicle, safety. Consists of OE, Communication channels, Telematics service **ORF 4**.

**Vehicle** — an object controlled within Telematic system. Usually Vehicle means a truck, tractor or bus, sometimes a locomotive or river boat. From Telematic system point of view, stationary objects are also considered to be vehicles: diesel gensets, stationary tanks, boilers/burners.

**Unit** — an element of Onboard Equipment of Vehicle, which is connected to Telematics Interface S6.
Introduction

Recommendations and guidelines contained in this Operation Manual are related to MasterCAN Vehicle Data Interfaces (hereinafter MasterCAN) and SK MasterCAN service kit developed by TECHNOTON JV, Minsk, BELARUS.

This document contains information on MasterCAN design, principle of operation, specifications as well as recommendations on its installation and operation. The document also defines SK MasterCAN connection and operation as well as manual on the included Service MasterCAN software (version 3.2 and newer).

MasterCAN — is a tool for Telematics systems designed for safe and uninterruptible data gathering from onboard information buses of global leading Vehicle manufacturers.

SK MasterCAN provides communication between PC and MasterCAN units for their configuration.

MasterCAN features:

- comply with national and European automobile standards;
- easy integration with vehicle Telematics systems;
- safe data integration from one or several onboard information buses to S6 Telematics interface S6 *
- simplifies setting-up of Telematics terminal by sifting unnecessary data
- simple input connection using Crocodile contactless readers
- automatic trip fuel consumption counter, incremented by hourly fuel consumption rate from onboard CANbus **
- power supply from the vehicle onboard power supply system without any additional power supply units.

* MasterCAN CC and MasterCAN V-GATE.
** For MasterCAN CC firmware v.8 and higher and for MasterCAN C 232/485 and MasterCAN V-gate firmware v.7 and higher
MasterCAN modifications:

- **MasterCAN CC** for receiving data from onboard CAN interface, converting received data and sending created FMS and Telematics messages to CAN/S6 interface;
- **MasterCAN C 232/485** for receiving data from onboard CAN interface, converting received data and sending created messages to RS-232 and RS-485 interfaces;
- **MasterCAN V-GATE** for receiving data from onboard CAN and J1708 interfaces simultaneously, converting received data and sending created FMS and Telematics messages to CAN/S6 interface and messages to RS-232 interface.

**MasterCAN** modifications are designated in accordance with table 1.

**Table 1 — MasterCAN modifications**

<table>
<thead>
<tr>
<th>Vehicle Data Interface</th>
<th>Input interface (Protocol)</th>
<th>Output Interface (Protocol)</th>
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<tr>
<td>X symbol standing for MasterCAN modifications</td>
<td>CC</td>
<td>CAN (SAE J1939)</td>
</tr>
<tr>
<td></td>
<td>C 232/485</td>
<td>CAN (SAE J1939)</td>
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<tr>
<td></td>
<td>V-GATE</td>
<td>CAN (SAE J1939) and J1708 (SAE J1587)</td>
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To ensure proper operation, MasterCAN should be connected and configured by certified professionals who have successfully finished manufacturer's technical training.

For MasterCAN configuration service kits SK MasterCAN and S6 SK can be used (purchased separately).

**ATTENTION:** The Manufacturer guarantees MasterCAN compliance with the requirements of technical regulations subject to the conditions of storage, transportation and operation set out in this Manual. Manufacturer reserves the right to modify MasterCAN specifications that do not lead to a deterioration of the consumer qualities without prior customer notice.
1 General information and technical specifications

1.1 Purpose of use and application area

MasterCAN are designed for information Vehicle buses data processing and generation of information ready for use by Telematics systems.

Application area of MasterCAN - is used within Telematics systems.

MasterCAN in combination with contactless readers CANCrocodile and 1708Crocodile can be used as convenient solution for data integration form onboard CANbuses and 1708buses to Telematics system (see figure 1).

MasterCAN analyzes information from automotive information buses, filters out excess data and generates output messages containing tens of most important operation parameters of Vehicle (e.g. instant and trip fuel consumption, total fuel consumption, RPMs, fuel level, engine operation time, engine temperature, oil pressure and level).

MasterCAN output messages are received by Telematics terminal which collects, records, stores and transmits data to Server. Software on the Server processes, analyzes received data and generates reports containing data on fuel consumption and parameters of Vehicle operation.

MasterCAN in combination with Crocodile is also a convenient solution for data gathering from sensors and peripheral devices of one or several onboard CAN (J1708) buses and data transfer to S6 Telematics interface. This allows to monitor various Vehicle operation parameters via just one CAN-port of Telematics terminal (see figure 2).

Figure 1 – On-board CAN and J1708 buses data integration in Telematics interface
Reports based on MasterCAN data allow monitoring of instant Vehicle fuel consumption rate as well as fuel volume consumed during trip (see figure 3)

Figure 2 – On-board automotive CANbus data transmission to S6 Telematics interface

Figure 3 – Automotive CANbus data monitoring through MasterCAN
1.2 Delivery set

1 MasterCAN vehicle data interface – 1 pc.;
2 Specification with factory settings sheet – 1 pc.;
3 MasterCAN MK VDI mounting kit (1 pc.) including:
   a) molex connector, 4 pins - 2 pcs.;
   b) molex connector, 6 pins - 2 pcs.;
   c) contact pin - 5 pcs.;
   d) fuse with holder (2 A) - 1 pc.;
   e) wire - 17 pcs.;
   f) S6 CW plug * - 2 pcs.;
   g) cable tie - 20 pcs.

* Includes embedded termination resistor 120 Ohm.

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