SUBTASK

“Remote engine blocking system”

Connection and configuration manual

Version 1.0

TECHNOTON

ADVANCED MACHINERY TELEMATICS

Contents

1 Purpose of use, application areas, operation principle

Purpose of use: The remote engine blocking system (hereinafter referred to as "the system") is used for remote control of vehicle engine on / off using the Telematics terminal.

Areas of application: The system can be used as an additional feature of vehicle Telematics systems in car-sharing companies, taxi services, companies owning automotives or special equipment, for increasing anti-theft security of a fleet.

Operation principle: For remote blocking of vehicle engine, an electromagnetic relay with normally closed contacts is used, installed, for example, in electrical circuits for controlling engine start or fuel supply system. The relay contacts are opened by the discrete output signal of MasterCAN DAC 15 digital-to-analog converter, generated upon receipt of a CAN control message from the CANUp27 Pro LTE telematic gateway connected to the converter over CAN j1939/S6 interface. The gateway generates a control message upon receipt of a corresponding GPRS command from ORF-4 / ORF-5 Telematics service or a special SMS message from any of 3 authorized phone numbers (see figure 1).

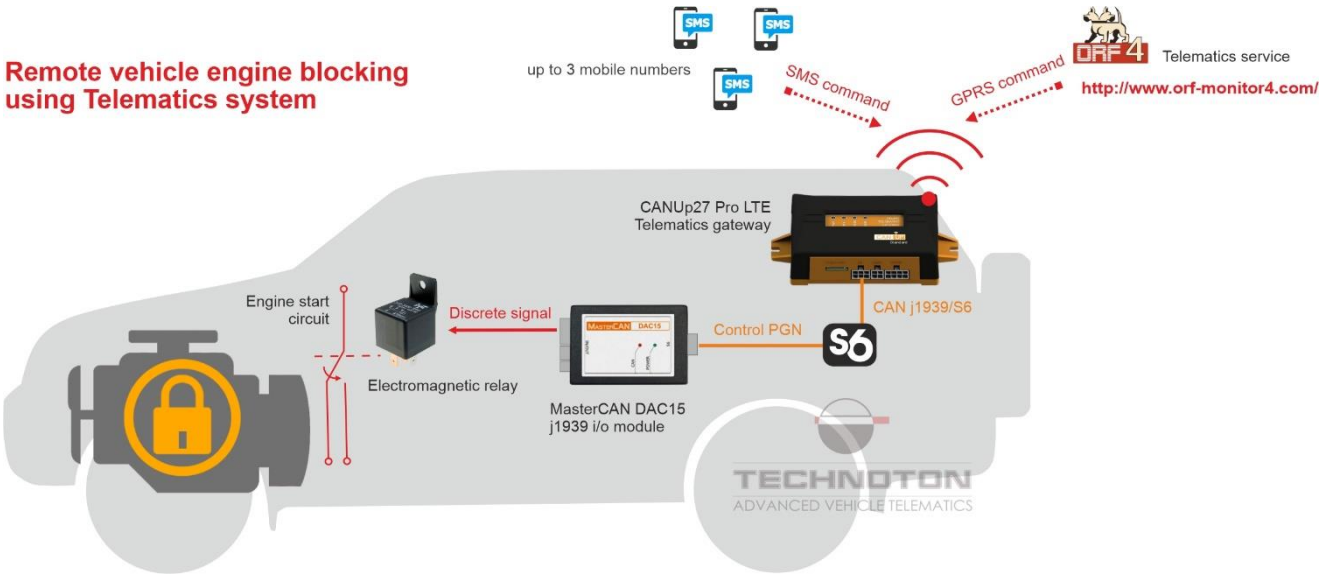

Figure 1 — The principle of operation of remote engine blocking system

WARNINGS:

1) It is strongly not recommended to use the remote engine blocking system while the vehicle is moving. The consequence of a sudden stop of the vehicle may be harm to the health and life of its driver, passengers and other road users.

2) Responsibility for the use of the remote engine blocking system in each specific case lies entirely with the officials making the decision to use it.

3) When sending a special GPRS command or SMS message, you should take into account the time delay from the moment they were sent to the moment the engine is blocked.

4) Before blocking engine remotely, it is recommended to make sure that the vehicle is parked and, if possible, warn the driver on the blocking.

2 Equipment

The system operation requires the following basic equipment:

- CANUp 27 Pro LTE Telematics gateway
  (firmware version 5.05 and higher) - 1 pc.;
- MasterCAN DAC15 j1939 i/o module
  (firmware version 1.17 and higher) - 1 pc.;
- S6 027 cable with power wire - 1 pc.;
- 12/24 V Electromagnetic relay (current — not more than 0.3 A)
  (e.g. TRV4-L-12V-Z-F or TRV4-L-24V-Z-F) - 1 pc.;
- Relay connector - 1 pc.

For the system configuration the following equipment might be necessary:

- S6 SK service adapter (not included in delivery set) - 1 pc.;
- Direct current power source (10…45 V; 3…10 A)
  (not included in delivery set) - 1 pc.;
- Micro sim card with GPRS, SMS
  (not included in CANUp 27 Pro LTE delivery set) - 1 pc.;
- PC with installed Windows 10 (not included in delivery set) - 1 pc.;
- software (see 3) and documentation - 1 pc.

IMPORTANT:
Before the start, we **strongly recommend** to download and read the following operation manuals from Technoton Document Center:
- CANUp 27 Pro LTE Telematics gateway;
- MasterCAN DAC15 j1939 i/o module;
- CAN j1939/S6 Telematics interface;
- ORF 4 Telematics service.

3 Software

It is necessary to install the following software to your PC for the system configuration:

- ORF 4 Telematics service http://www.orf-monitor4.com;
- Special software Service CANUp (version 5.10 and higher);
- Special software Service S6 MasterCAN (version 3.25 and higher);
- Driver USB — Drivers CP 210 Windows (CP210xVCP Installer x64 for 64 bit);
- File containing special configuration profile for CANUp 27 Pro LTE;
- File containing special configuration profile for MasterCAN DAC15;

ATTENTION:
1) Work with the service adapter is possible only after you install the USB driver on the PC.
2) The current versions of the Units service software can be downloaded from the http://www.jv-technoton.com website (Software/Firmware section).
3) To obtain files of special configuration profiles for CANUp 27 Pro LTE and MasterCAN DAC 15 and (or) if you have any questions about operating the equipment, please contact Technoton technical support by support@technoton.by.

4 Electrical connection

ATTENTION:

1) When connecting the equipment of the system strictly follow safety rules of car repair works as well as local safety rules of the customer' company.

2) Before the start, it is recommended to carefully study through the electrical circuit diagram and Operation manual for the Vehicle, where system is mounted.

To ensure the correct operation of the system, installation and configuration of the equipment must be carried out by certified specialists who have undergone training in Technoton.

IMPORTANT:

1) Before you start electric connection operations, de-energize electric circuits for power supply of the unit to be equipped. When you mount the converter on the Vehicle, switch off the battery or remove the contact terminals from the battery.

2) Prior to electrical connection of the sensor pay special attention to checking Vehicle chassis ground. Resistance between any point of vehicle chassis and "-" terminal of the battery or between terminals of the chassis ground switch should not exceed 1 Ohm.

3) When connecting CANUp 27 Pro LTE to onboard electrical network of Vehicle, use fuse (2 A) from delivery set in accordance to scheme of connection.

4) It is strongly recommended to lay CANUp 27 Pro LTE signal cable together with the standard vehicle wiring with the mandatory tie-wrap fixing of every 50 cm, at positive ambient temperature.

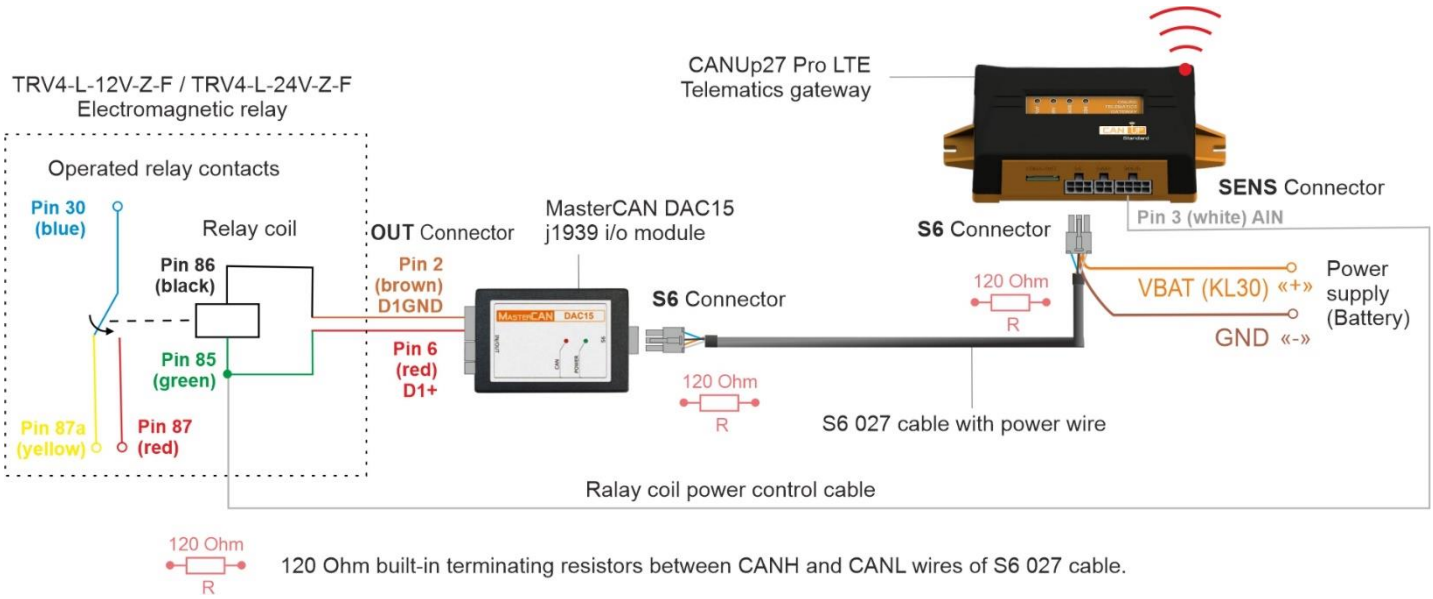

Figure 2 — Electrical connection diagram of the remote engine blocking system equipment

Equipment connection sequence:

1) Connect CANUp27 Pro LTE telematics gateway to MasterCAN DAC 15 digital-to-analog converter via S6 Technology using S6 027 cable. Power supply of the system equipment from the vehicle on-board network is connected through the wires of the S6 027 cable (see figure 3).

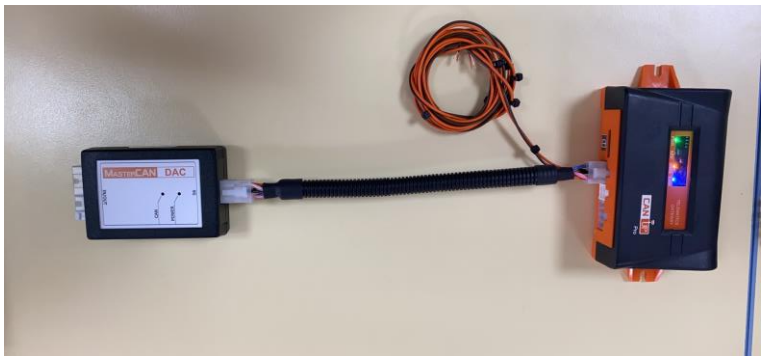

Figure 3 — Using S6 027 cable to connect Units via S6 Technology and power the system

2) Assemble the connector for connecting the discrete output of the digital-to-analog converter to the relay coil. Use socket, wires and contacts from the mounting kit supplied with MasterCAN DAC 15. Connect red wire to pin 6 of **Molex 8 pin socket**, brown wire — to pin 2 (see figure 4).

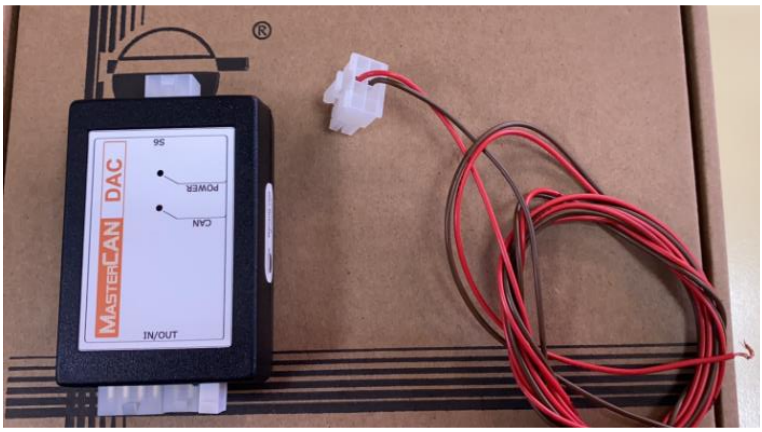

Figure 4 — Assembling the connector for connection to discrete output of MasterCAN DAC 15

3) Connect the assembled connector to the OUT connector of MasterCAN DAC 15 digital-to-analog converter (see figure 5).

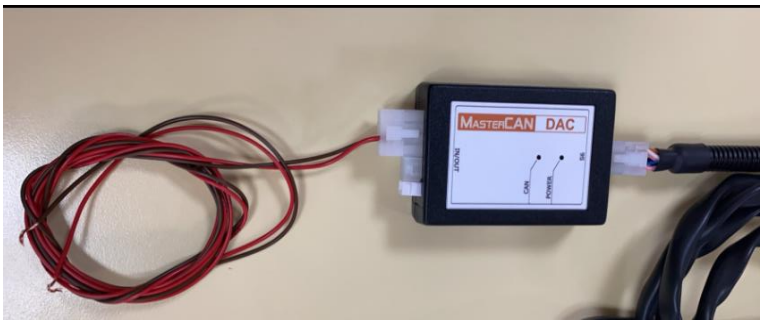

Figure 5 — Connecting assembled connector to the discrete output of MasterCAN DAC 15

4) Connect the discrete output wires of MasterCAN DAC 15 with the wires of the relay connector by twisting them or using clip connectors (see figure 6).

Assignment of contacts of the relay connector:
Contacts **85** (green wire «+»), **86** (black wire «-») – relay coil power;
Contact **30** (blue wire) – main control contact;
Contact **87a** (yellow wire) – normally closed contact in relation to contact **30**;
Contact **87** (red wire) – normally opened contact in relation to contact **30**.

Figure 6 — Connecting discrete output wires of MasterCAN DAC 15 with the power wires of the relay coil

5) Select a relay with an appropriate coil supply voltage (12V / 24V) and install it in the connector (see figure 7).

ATTENTION: The relay is selected based on the supply voltage of the battery of equipped vehicle. **The voltage of the relay coil must match the voltage of the on-board network!**

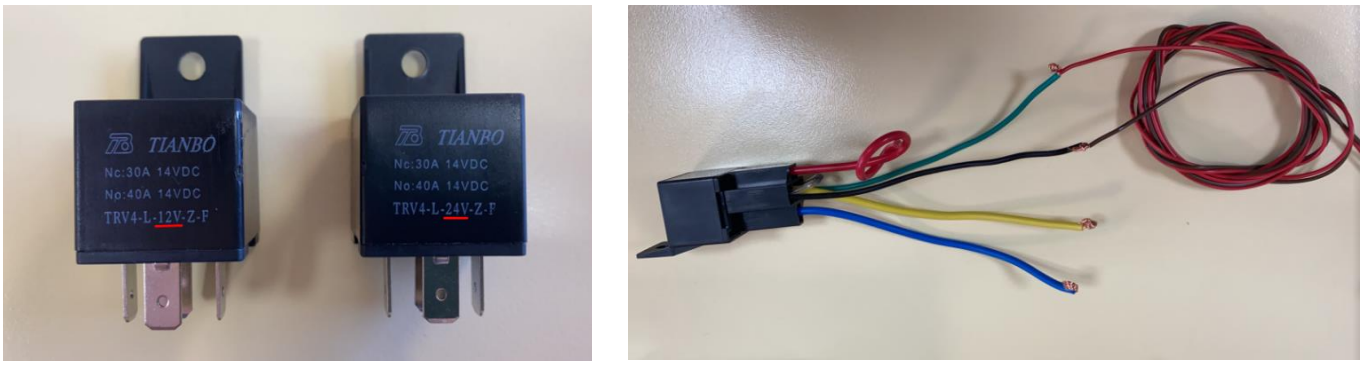

Figure 7 — An example of finding out supply voltage of the coil when selecting a relay and installing a relay in a connector

Normally closed relay contacts (**30** - blue wire, **87a** - yellow wire) are used for remote engine blocking. These contacts must be connected "inline" in the electrical circuit of the vehicle, which stops engine if disconnected.

In the normal state, these contacts are closed. Voltage at the power supply contacts of the relay coil (**85** - green wire, **86** - black wire) supplied from the discrete output of MasterCAN DAC 15 (**OUT** connector, pin 2 (brown, "-"), pin 6 (red, "+")) is equal to 0 V (see figure 2).

CANUp27 Pro LTE telematics gateway uses S6 Technology to send out PGN 65241 message, which contains SPN 701 Parameter with possible values "0", "1", "2", "3". The value "3" corresponds to a low voltage level (0 V) at the discrete output of MasterCAN DAC15, supplied to the relay coil.

To open the power contacts of the relay, a user should send GPRS control command or special SMS message, which will contain SPN 701 value "0", to CANUp 27 LTE. In this case MasterCAN DAC15 will supply a discrete signal of a high voltage level (12V / 24V) to the coil, which will open the normally closed contact of the relay.

6) For additional control of the relay coil status, it is necessary to connect CANUp 27 analogue input (**SENS** connector, pin 3 (white, AIN) to the "+" power contact of the relay coil) using white wire of **CANUp 27 cable** (supplied with the telematics gateway) (see figure 8).

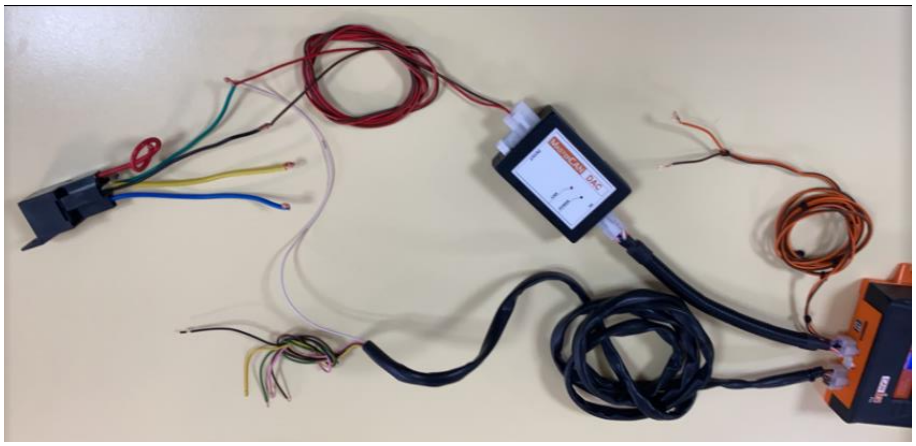

Figure 8 — Connecting power contact of the relay coil to the analog input of CANUp 27 LTE

7) Connect power supply wires of the assembled engine blocking system to the power supply of the on-board network (battery), and the wires of the control contacts of the relay "inline" in the electrical circuit, which stops vehicle engine if disconnected. Insulate all exposed wire ends (see figure 9).

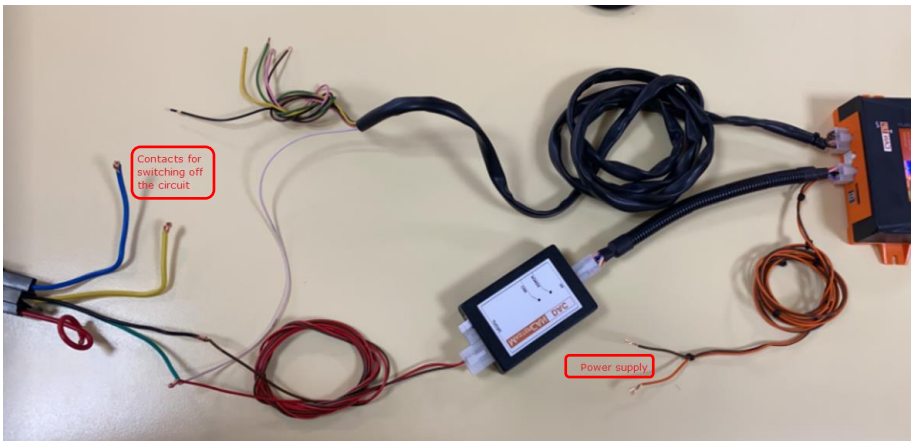

Figure 9 — Wires of the system connected to the corresponding vehicle wires

5 Configuring the system

5.1 Configuration of CANUp 27 Pro LTE

ATTENTION: It is recommended to preliminary get a special configuration profile from Technoton technical support and load it to CANUp 27 Pro LTE.

1) Connect S6 SK service adapter to CANUp 27 Pro LTE and log in to Service CANUp software (login is **0**, password is **1111**). Connect the telematics gateway to the Internet:

- enter Internet connection settings of the Unit GPRS modem (APN of mobile communication operator);
- taking note of GPRS modem indications parameters make sure the modem is connected to Internet.

ATTENTION: For obtaining APN settings, contact service center of SIM-card provider.

2) Enter settings for CANUp 27 Pro LTE connection with AVL Server.

IMPORTANT: Data inserted into the fields of prefix (ID) should match with data inserted into the fields "Unique ID", they are entered during registration in the ORF 4 Telematics service (see ORF 4 Telematics service. User manual).

ATTENTION: If connection problems occur, contact ORF-4 Service administrator by e-mail support@technoton.by.

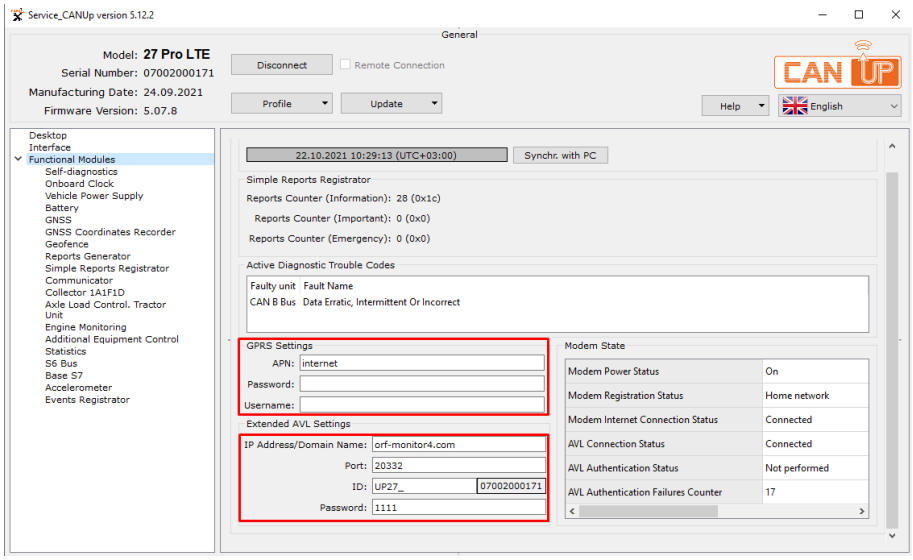

Figure 10 — Configurations of Internet connection and Telematics server connection

3) Enter the allowed phone numbers (up to 3) from which the system should be controlled via SMS messages.

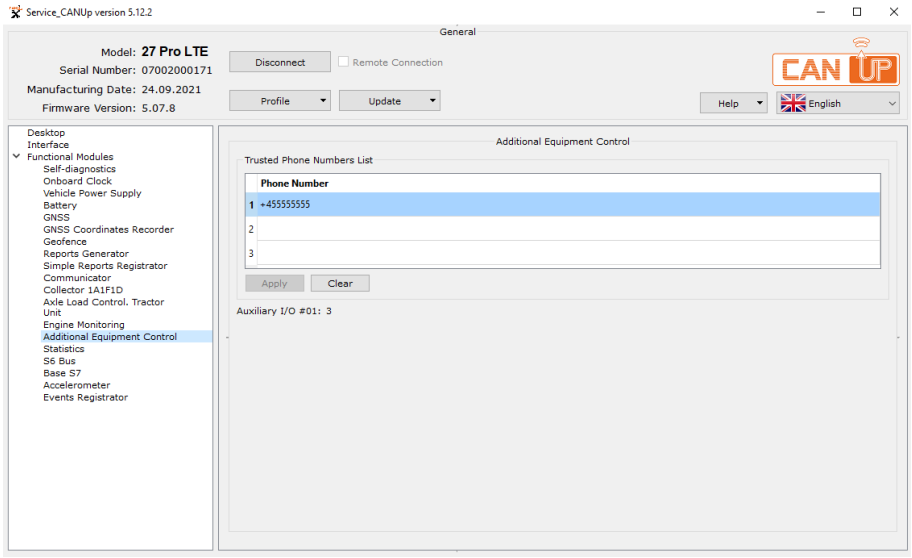

Figure 11 — An example of entering allowed mobile numbers for sending SMS control messages

4) Configure the Report (in case you have not received the special configuration profile). The following SPNs can be used to monitor the system status in the Report:
SPN 521055 (PGN 63089) — vehicle onboard voltage (monitoring of power supply to the engine blocking system).
SPN 521488 (PGN 63169) — diagnostics of CAN bus between CANUp27 Pro LTE and MasterCAN DAC15 (Unit connection check).
SPN 701 (PGN 65241) — CANUp27 Pro LTE status (monitoring of the Unit output status and relay control commands).
SPN 521729 (PGN 63299) — voltage on the relay coil (monitoring of the position of the relay control contacts).

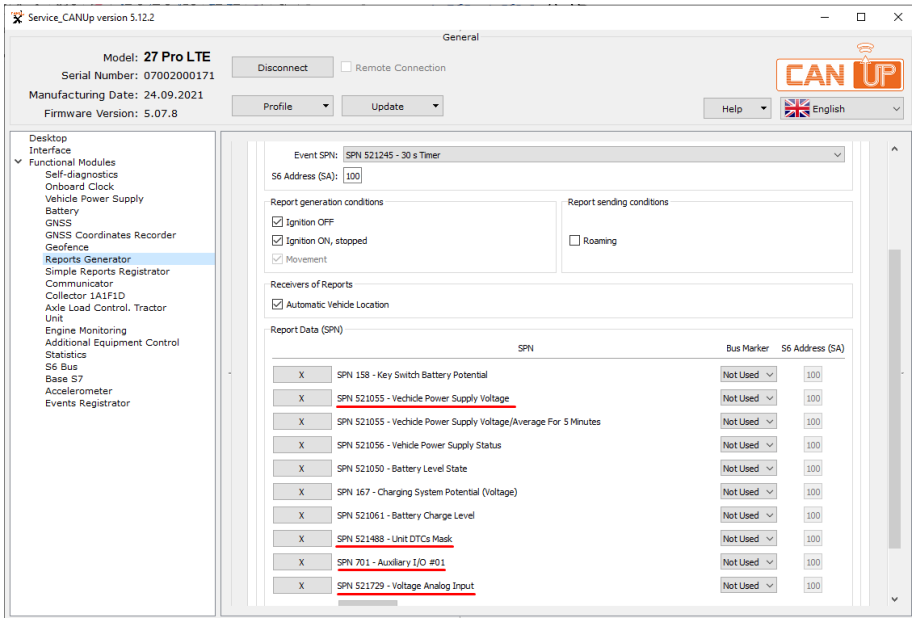

Figure 12 — An example of generating Report for monitoring the state of the system

5) Configure the analog input of the Unit to monitor the voltage of the relay coil.

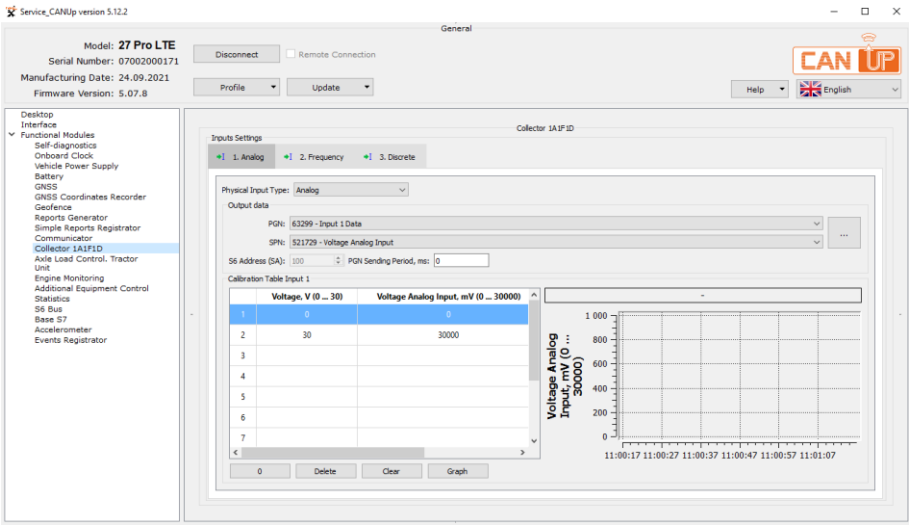

Figure 13 — Example of configuring analog input of CANUp 27 Pro LTE

6) Save changed profile to Unit.

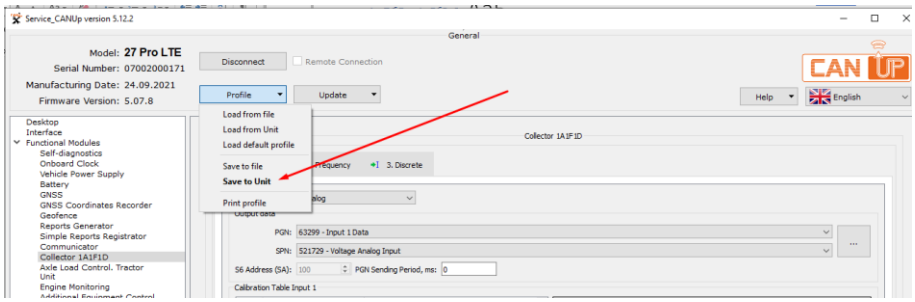

Figure 14 — Example of saving changed profile configurations to CANUp 27 Pro LTE

5.2 Configuration of MasterCAN DAC15

ATTENTION: It is recommended to preliminary get a special configuration profile from Technoton technical support and load it to MasterCAN DAC 15.

1) Connect S6 SK service adapter to MasterCAN DAC15 and log in to Service S6 MasterCAN software (login is **0**, password is **1111**). Configure discrete output of digital-to-analog converter.

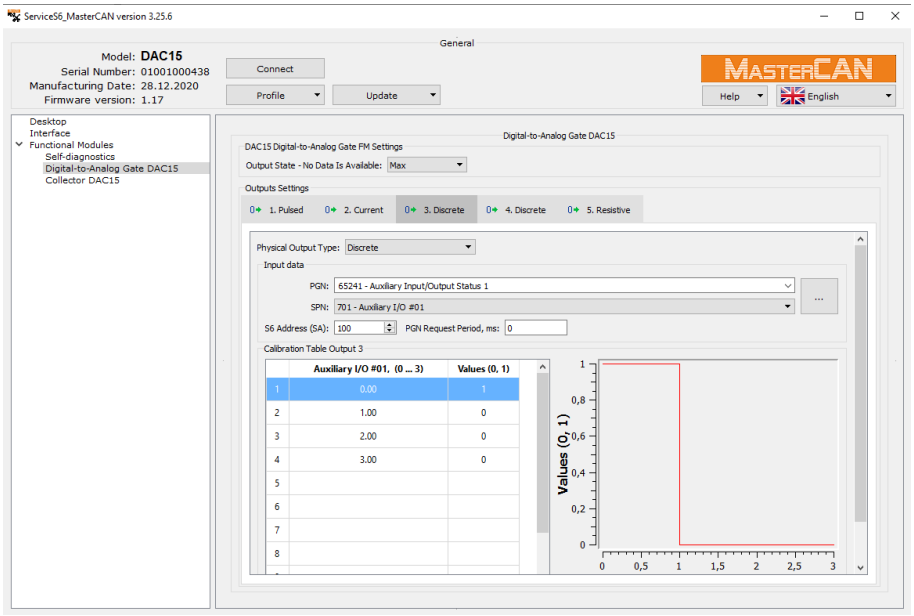

Figure 15 — Example of configuring discrete output of MasterCAN DAC15

2) Save changed profile to Unit.

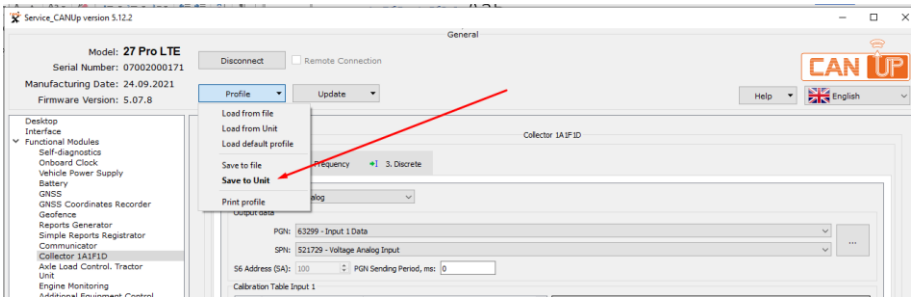

Figure 16 — Example of configuring analog input of MasterCAN DAC15

5.3 Configuration of ORF 4 Telematics service

1) To register the Vehicle or stationary object with CANUp 27 Pro LTE installed in Telematics service ORF 4 (see the document Telematics service ORF 4. User manual).

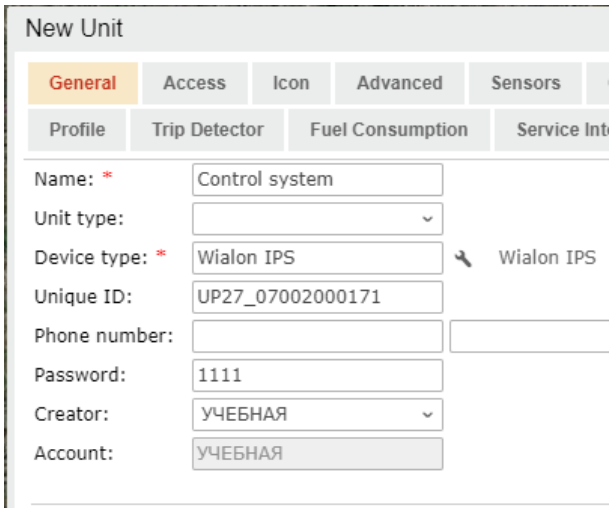

Figure 17 — ORF-4 server configuration example

2) Make sure that data is transmitted to the Server correctly.

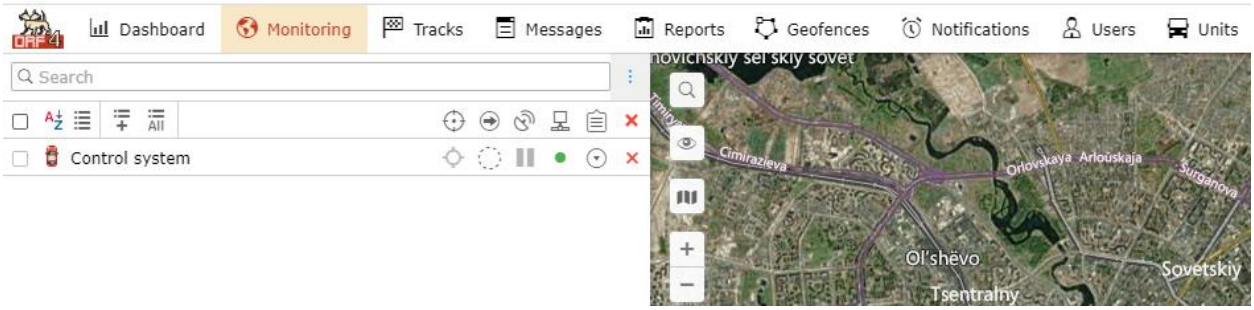

Figure 18 — Example of displaying a vehicle which is equipped with 27 Pro LTE, in ORF-4 Telematics service

6 Function test

Remote control of engine blocking system is carried out using special SMS commands (the phone number must be indicated in the list of allowed ones) or GPRS commands from ORF-4 Telematics service.

List of commands for remote control of the relay:

++B1111;100;RUNR;5;/++ cancel forced engine stop;

++B1111;100;STOP;120;/++ stop engine after vehicle is parked for at least 5 minutes its speed is 0 and its coordinates are available.

WARNING: Sending special SMS or GPRS commands should not occur more often than once every 3 ... 5 minutes.

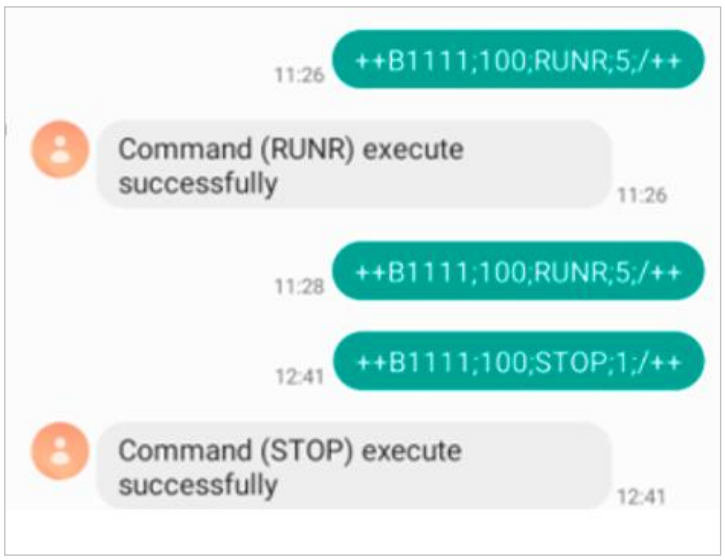

Figure 19 — Example of controlling the system by SMS commands

Command controlling from ORF-4 Telematics service is performed from monitoring tab.

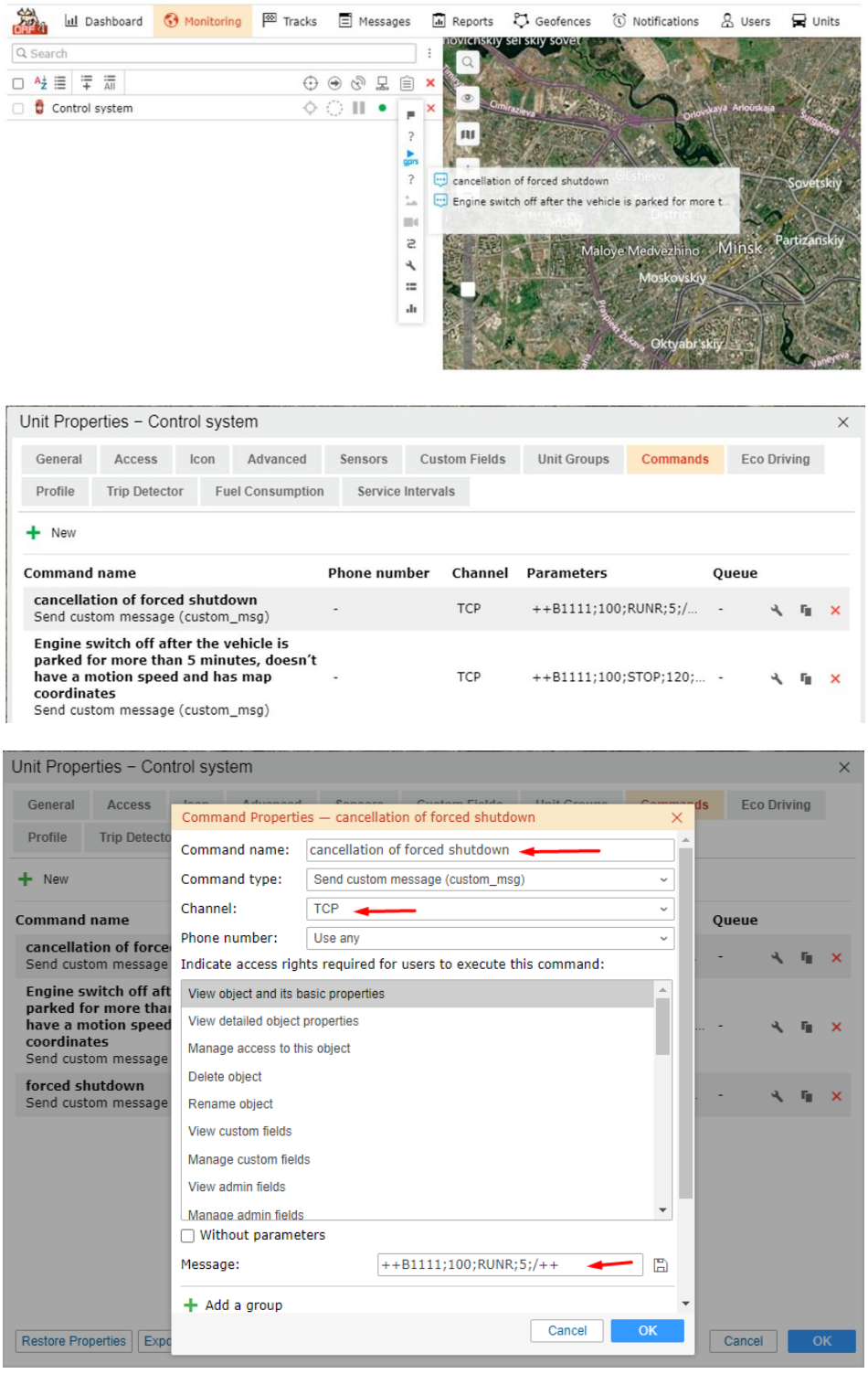

Figure 20 — Example of creating a command in ORF-4 Telematics service

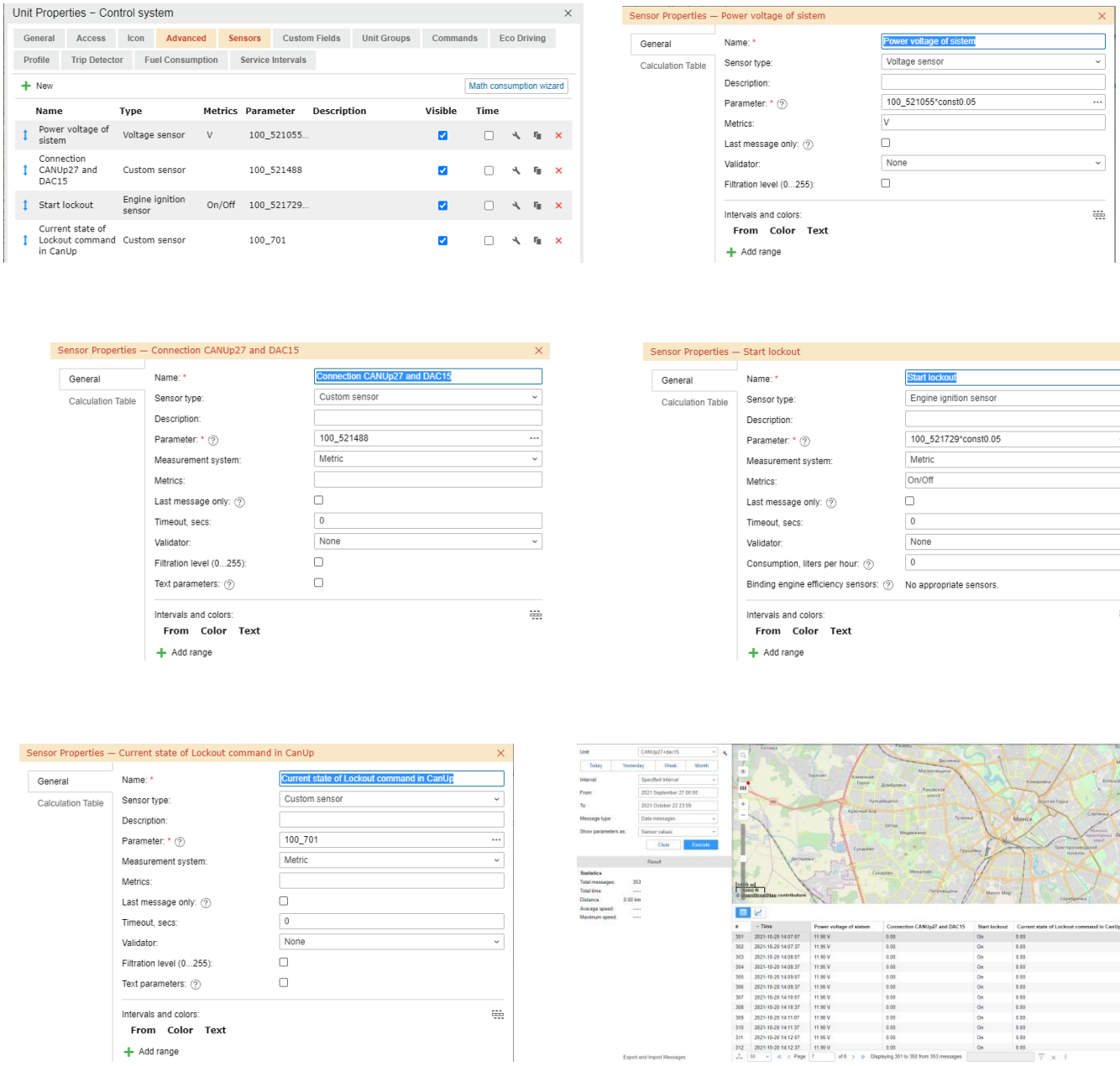

Figure 21 — Example of setting up ORF-4 Telematics service for testing operation of the remote engine blocking system

Contacts

Manufacturer

Tel/Fax: +375 17 240-39-73

https://www.jv-technoton.com/

http://s6.jv-technoton.com/

E-mail: marketing@technoton.by

Technical support

E-mail: support@technoton.by