Radio transmitter

T10, T10C, T10R
T10U, T10UC, T10UR

(v.160809)

Installation manual

www.trikdis.com

Content

Safety requirements

Before using the transmitter, make sure to read these instructions and follow safety requirements.

Installation and maintenance of communicator shall be subject to qualified specialists having knowledge about low-voltage equipment, radio transmitting equipment and complying with safety requirements.

T10 transmitter is mounted in limited-access areas at safe distance from the radio-emission sensitive electronic equipment.

1. Descripcion

T10 is a transmitting device applied for transmitting messages of intruder and fire alarm systems to an alarm receiving and monitoring center (ARMC) at specified licensed VHF or UHF radio frequency. The transmitter are connected to a control panel for transmitting received signals or messages of control panel whereas radio receiver of ARMC receives these and directs to alarm monitoring software. Features:

- Transmitters *T10, T10C* and *T10R* transmits at VHF radio frequency whereas transmitters *T10U, T10UC* and *T10UR* transmits at UHF radio frequency;
- Transmitters with modifications *T10, T10R* and *T10U, T10UR* transmit messages collected from data bus of control panel whereas transmitters with modifications *T10C* and *T10UC* transmit messages if their input status changes due to external circuit state;
- Each transmission can be encoded with two different transmission protocols and transmitted at two different licensed radio frequencies;
- Transmission power 1,5 or 5W;
- Transmission RAS-002, RAS-2M, LARS, LARS1 and RAS-3_CID (full Contact ID coded) reports;
- All operating parameters are set with the software *T10config* via USB port.

2. Operation

The transmitter forwards messages received from control panel at set licensed radio frequency and protocol to ether. The same message can be sent 1-8 times. Transmitter can be set to broadcast information by two different protocols, at two radio frequencies with two different object IDs for each frequency.

Most of the modern **control panels** form event message in Contact ID format, SIA DC-05-1999.99 standard describes this format. If the **transmitter** is set to encode transmission in RAS-3_CID format, then Contact ID message is transmitted unchanged. In order to synchronize transmitter with the existing receiving equipment, other suitable transmission encoding formats can be set. However, other formats cannot encode full Contact ID, because of that transmitter converts them to the UNI codes. The conversion table can be edited. If ARC (Alarm Receiving Centre) uses receiving equipment of TRIKDIS, thus received UNI code is directed to existing alarm monitoring software at compatible format.

To the transmitter input IN (programmable type *NC/NO/EOL=2.2 kΩ*) external circuits can be connected. When any of the inputs is triggered, transmitter broadcasts the set message.

Transmitter periodically sends test messages. The monitoring software inspects timely receipt of those reports.

Transmitter automatically monitors power supply voltage. If voltage falls below 11.5 V threshold, the transmitter will send a report about power supply failure. If voltage rises above 12.6 V threshold, the transmitter will send a report about power supply restore.

When power supply voltage falls below 10 V threshold, the transmitter will send a report on switching to *sleep* mode. In *sleep* mode transmitter does not receive or send any messages. If transmitter operates in *sleep* mode and power supply voltage rises above 12.6 V threshold, then the transmitter will start operating in working mode and will send the *test* message.

The use of T10 (T10U) can be expanded by using additional interfaces C11, C14, C16 or CZ6. Operation and wiring diagrams of interfaces can be found in their installation manuals.

The use of interface

Interface	Description
C11	Receives DTMF tone messages coded in Contact ID protocol of security panel telephone communicator and sends them to transmitter *T10, T10U*.
C14	Receives DTMF tone messages coded in Contact ID protocol of security panel telephone communicator and sends them to transmitter *T10, T10U*. In addition, landline can be wired to interface. In this case, the interface enables the security control panel reporting to monitoring station through two different communication channels. This interface enables the use of one channel as main and the second one as backup.
C15	Receives data from data bus of BOLID C2000 alarm control panel and sends it coded in Contact ID protocol to transmitter *T10, T10U*.
CZ6	Expands transmitter *T10, T10U* inputs IN number up to 6 EOL=2.2 *kΩ* type.

3. Technical specifications

Parameter	Description
Supply voltage	Constant voltage from 10 to 15 V; nominal +12.6 V
Current consumption	Up to 60 mA in standby; Up to 1000 mA when broadcasting
Radio frequency range	Radio frequency programmed with *T10config* configuration software: transmitters *T10, T10R, T10C*: *VHF* band from 146 MHz to 174 MHz; transmitters *T10U, T10UR, T10UC*: *UHF* band from 410 MHz to 470 MHz.
Operating frequency count	Up to 2 frequencies
Transmission power	Selectable 1.5 or 5.0 W
Antenna output impedance	50 Ω
Secondary (collateral) emissions	Meets the requirements of EN 300 113
Broadcasting time	From 60ms to 400ms depending on the selected radio system
Broadcasting repeat count	Selectable from 1 to 8 times
Message buffer capacity	Up to 100 events
Inputs *IN* to connect external circuits	T10, T10U - 2 NC/NO/EOL=2.2 kΩ type T10R, T10UR - 2 NC/NO/EOL=2.2 kΩ type T10C, T10UC – 5 NC/NO/EOL=2.2 kΩ type
Settings configuration	*T10config* software via USB port
Working range	Temperature from -20 °C to 55 °C, relative air humidity up to 90 % at +20 °C
Dimensions	65 x 135 x 25 mm

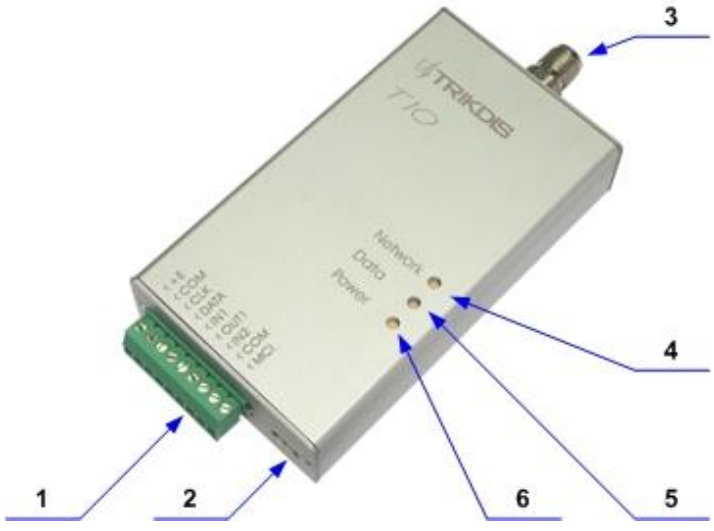
Transmitter broadcasting protocols and compatibility with the radio receiver

	RAS-002	RAS-2M	LARS	LARS1	RAS-3_CID
TRIKDIS R7	+	+	+	+	
TRIKDIS RF7	+	+	+	+	
TRIKDIS R11					+
TRIKDIS RF11					+
Other manufacturers			+	+	

4. Package contents

Transmitter	1 pcs.
Resistor (2,2 kΩ)	2 pcs.
Mounting screws M3x6	2 pcs.

5. Outside view



1. Terminal block
2. USB port and SERVICE button
3. Antenna connector
4. *Network* indicator
5. *Data* indicator
6. *Power* indicator

5.1. Meaning of the terminals

Transmitter T10, T10R, T10U, T10UR terminals	Description
+E	+12V power supply terminal
COM	Common ground terminal
CLK	Synchronization signals terminal
DATA	Data signals terminal
IN1	1st input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
OUT1	Output terminal (will be used in future)
IN2	2nd input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
COM	Common ground terminal
MCI	MCI data bus terminal

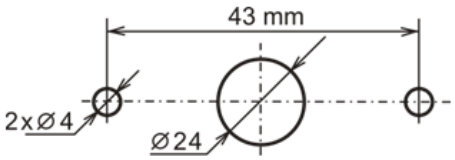
Transmitter T10C, T10UC terminals	Description
+E	+12V power supply terminal
COM	Common ground terminal
IN1	1st input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
IN2	2nd input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
IN3	3rd input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
IN4	4th input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
IN5	5th input terminal for connection of external circuits (type NC/NO/EOL=2.2 kΩ can be set)
COM	Common ground terminal
MCI	MCI data bus terminal

5.2. LED indication

LED	Operation	Meaning
Network indicates message status	Green flash	Message transmission
Data indicates data exchange	Constant green	Unsent messages are present in the memory
	Green flash	Message is incoming from control panel
	Red flashing	Transmitter operating in *sleep* mode
	Constant red	Overflow of the memory
Power indicates the power status, programming mode	Green flashing	Power supply voltage is sufficient.
	Yellow flashing	Power supply voltage is insufficient (≤11.5 V),
	Green and yellow in turn flashing	Programming mode or USB powered only (not operational mode)

6. Installation

1. Set the operating parameters of transmitter. See: **Setting of operating parameters with T10config software**
2. Mount the transmitter inside of control panel's metal casing. Mounting and antenna holes position and dimensions:



3. Connect antenna.
4. Following provided schematics connect a control panel, sensors and output connections.
5. Turn on power supply.
6. According to the operation of LED indicators, assess whether the transmitter is operating properly.
7. Make sure that the radio receiver receives messages transmitted by the transmitter. If message receiving level is low, more efficient antennas should be used for transmitter and/or receiver.

6.1. Wiring diagrams

Transmitters T10, T10R (T10RU), T10U have 2 input terminals (IN1, IN2), T10C (T10UC) have 5 input terminals (IN1, IN2, IN3, IN4 and IN5), these terminals can be used for connecting other devices, such as sensors, panic buttons or siren output, also it can be wired to control panel PGM output terminal.
It is essential to estimate how devices are working before connecting it to a circuit and what type circuit will be (Circuits below)
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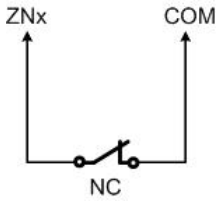
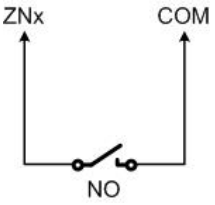
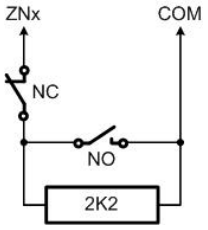
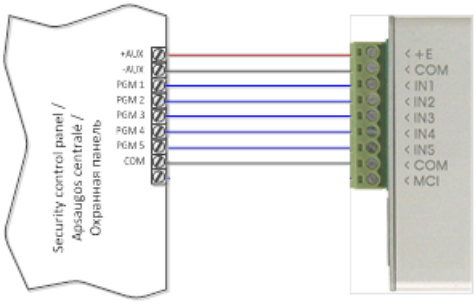
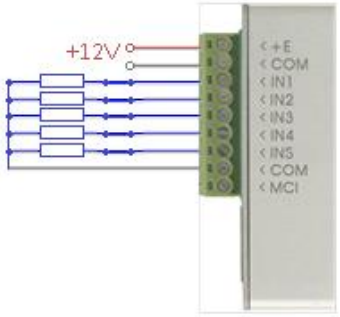
Normally closed circuit (NC)	Normally open circuit (NO)	Normally open circuit with end of line resistor (EOL, End of Line)
		

Transmitter *T10C, T10UC* can be connected to any control panel's PGM outputs or used as a standalone security device:



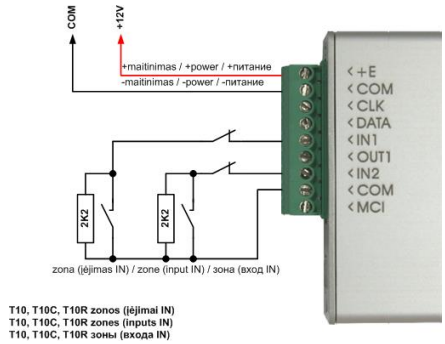
Transmitter T10C, T10UC connection to control panel. Input type set as *NO* or *NC*.



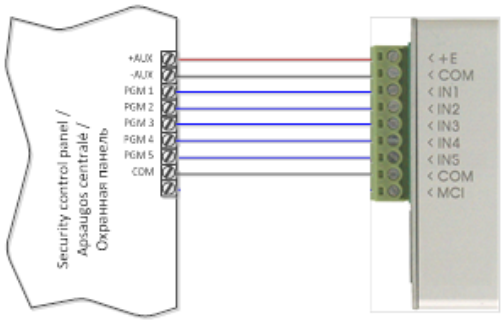
Transmitter T10C, T10UC connection to control panel. Input type set as *EOL=2,2 kΩ*.

Transmitter *T10, T10R, T10U, T10UR* can be connected to the widespread control panels:

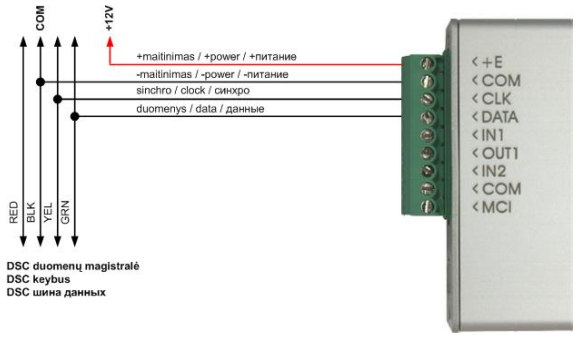
Manufacturer	Compatible control panel models	T10R T10UR	T10 T10U
DSC®	PC585, PC1565, PC5020, PC1616, PC1832, PC1864	+	+
PYRONIX®	MATRIX 424, MATRIX 832, MATRIX 832+, MATRIX 6, MATRIX 816	+	+
GE®	CADDX NX-4, NX-6, NX-8	+	+
PARADOX®	SPECTRA SPxxxx, 1727, 1728, 1738	+	+
PARADOX®	MAGELLAN MG5000, MG5050	+	+
PARADOX®	DIGIPLEX EVO48, EVO192, EVOHD, NE96, EVO96	+	+
PARADOX®	ESPRIT E55, E65, 728ULT, 738ULT	+	+
SECOlink	PAS832	+	+
TEXECOM	PREMIER 412, 816, 816+, 832 PREMIER ELITE 12, 24, 48, 88, 168, 640	+	
CROW	RUNNER	+	
ARGUS-SPECTR	Strelec	+	
BOLID	C2000	+	*C16*
ROVALANT	A6-06 (LARS / MAYAK)	+	
TRIKDIS	Interface modules series Cx	*C16*	*C11, C14,* *C16, CZ6*



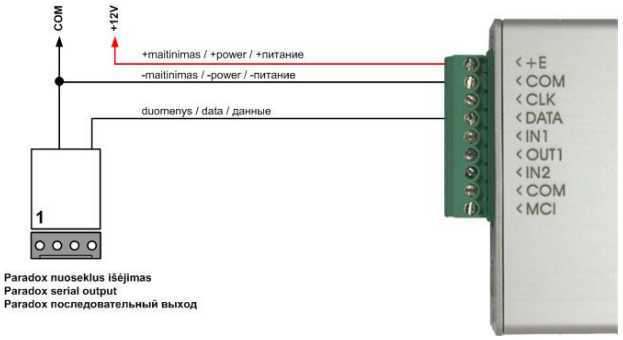
Transmitter *T10, T10C, T10R (T10U, T10UC, T10UR)* connection to control panel. Input type set as *EOL=2.2 kΩ*.



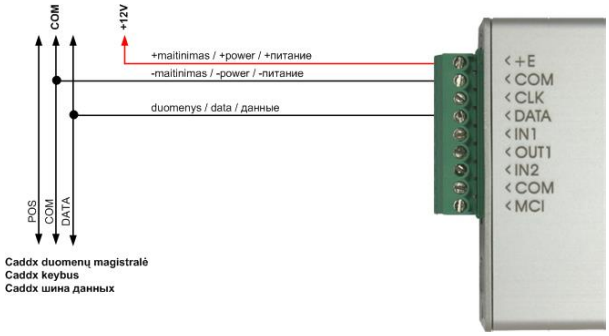
Transmitter *T10, T10C, T10R (T10U, T10UC, T10UR)* connection to control panel. Input type set as *NO* or *NC*.



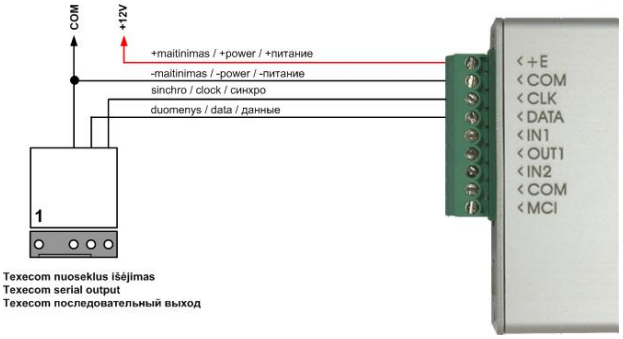
Connection to DSC® Power Series control panels.



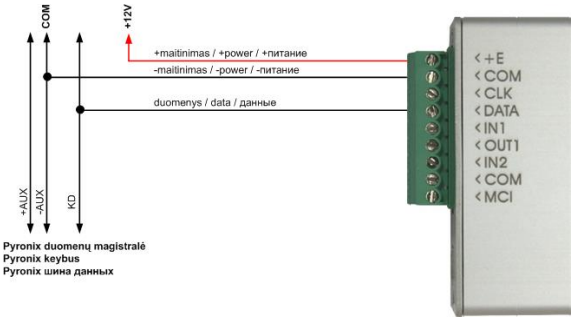
Connection to PARADOX® control panels. **CRP2 cable is needed.**



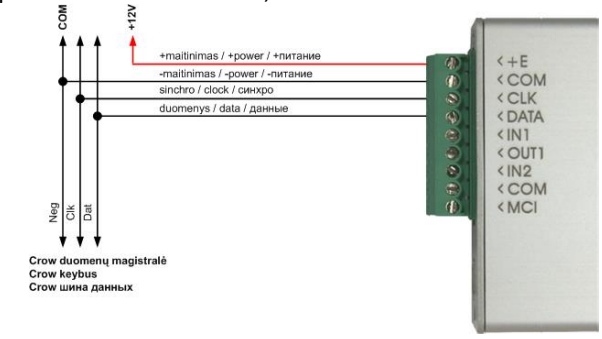
Connection to GE® *Caddx* control panels.



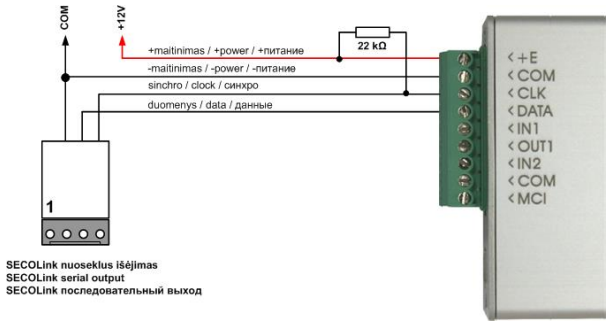
Transmitter *T10R (T10UR)* connection to *Texecom* control panels MATRIX PREMIER, MATRIX PREMIER ELITE.



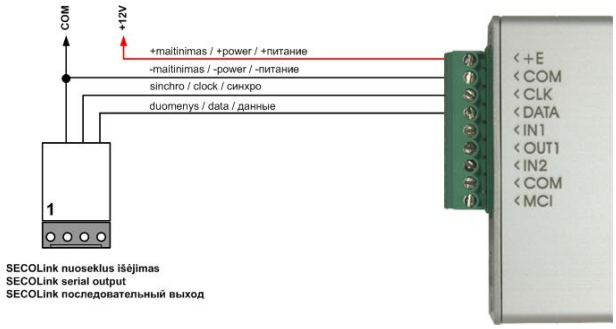
Transmitter *T10, T10R (T10U, T10UR)* connection to PYRONIX® Matrix Series control panels.



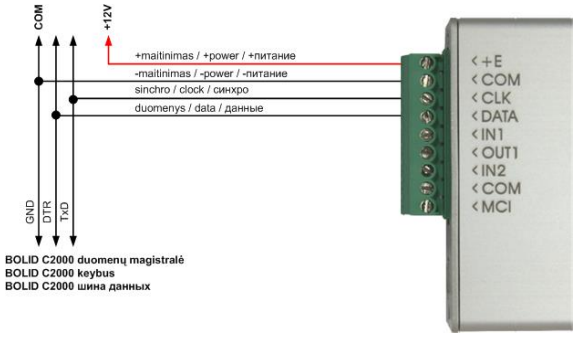
Transmitter *T10R (T10UR)* connection to *Crow* control panels RUNNER.



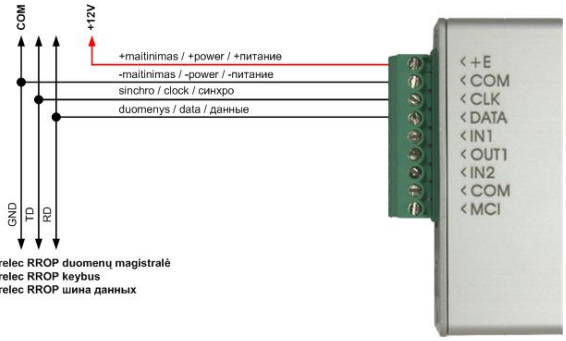
Transmitter *T10 (T10U)* connection to SECOLink control panels PAS832.
CRP3 **cable is needed**.



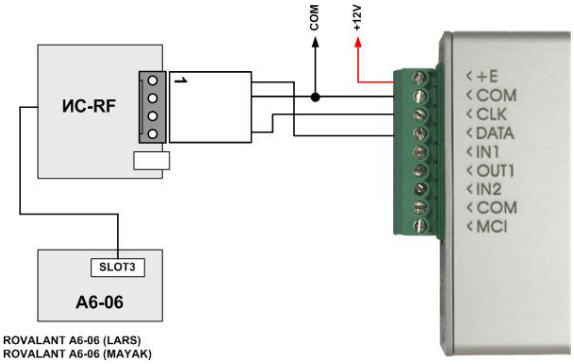
Transmitter *T10R (T10UR)* connection to SECOLink control panels PAS832.
CRP3 **cable is needed**.



Transmitter *T10R (T10UR)* connection to BOLID control panels C2000.



Transmitter *T10R (T10UR)* connection to ARGUS-SPEKTR control panels Strelec.



Transmitter *T10R (T10UR)* connection to ROVALANT control panels A6-06.

7. Setting of operating parameters with T10config software

You can download ***T10config*** software from the *www.trikdis.com* website.
In order to limit the ability to change the transmitter settings, user access control is implemented in two ways:

1. User Access control using password stored in the transmitter memory.

Software user who is authorized to use more of the following features will be called *Admin*, and the lower-level user whose rights are more restricted will be called *User*. After logging in with the password of *User* these features are available, that are identified by *Admin* only. After logging in with the password of *Admin*, you can use all available features and restrict permissions to *User*. See **Annex. Configuration of authorization and access restricting for another user**.

2. Software features control, using license file stored in *T10config* folder.

Software distributor may limit its functionality and determine appropriate rights to a customer. Permission settings are stored in *license.lic* file that may be provided due to distributor and customer agreement. If the software during start-up will be unable to read settings from permissions file, then it will run in DEMO mode, i.e. maximum restrictions will be set. Permissions file *.lic is loaded with menu commands ***File/Import***. See **Annex. Configuration of authorization and access restricting for another user**.

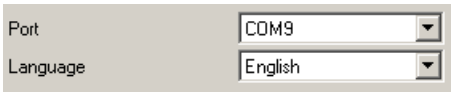
7.1. Setting of operating parameters

1. Connect T10 transmitter to PC's USB port by using USB cable.

Note: USB driver must be installed on PC. When the transmitter is connected to PC for the first time, MS Windows should open the USB driver installation window - ***Found New Hardware Wizard.*** Download MS Windows USB driver from www.trikdis.com website. In the wizard window select the option ***Yes, this time only*** and click ***Next*** button. After ***Please choose your search and installation options*** window is opened, click Browse button and specify the location where USB driver was saved. Follow the wizard and perform all the remaining steps to install the USB driver.

2. Run ***T10config*** software.

3. Select the branch named ***Settings***.

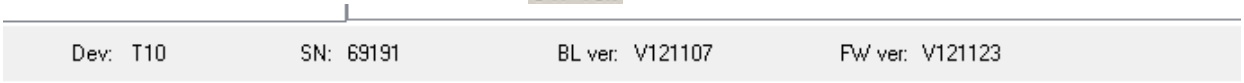


In field **Port** you must select a port that transmitter is connected to.
A specific port occurs only when transmitter is connected and USB driver is installed properly. See Connect T10 transmitter to PC's USB port.
From ***Language*** field select preferred user interface language.

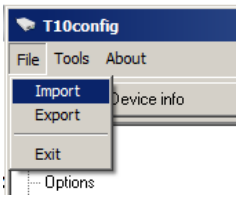
4. Click ***Device info*** button.

When the transmitter is connected to PC by USB cable, **Power** indicator should flash green and yellow in turn. In *T10config* software's status bar should be displayed connection status *Connected* and information about the connected transmitter:

Dev: T10	Product number;
SN: 422	Transmitter serial number;
BL ver:	Boot-loader version;
SW ver:	Transmitter firmware version.



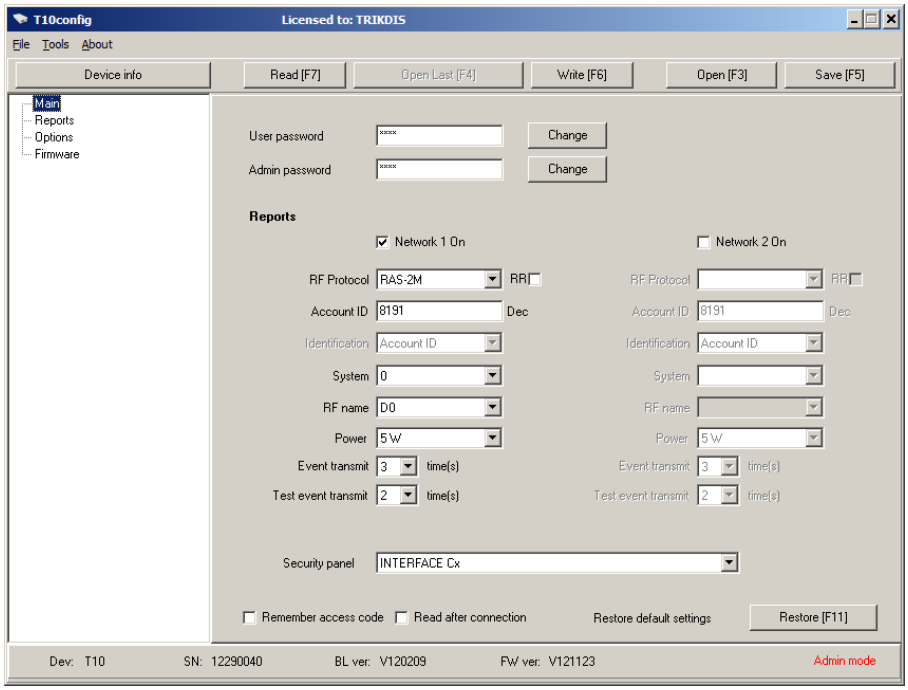
5. When the T10config software is launched for the first time click on ***File / Import*** and open the file *.lic extension. The next time T10config will be launched it will start with license.



6. Click ***Read [F7]*** button.

When the request window ***Access Code*** appears enter log-in password (default password - 1234), then click ***OK***.
In case of logging in with *User* password, program will show only the features that are identified by *Admin* user. In case of logging in with the password of *Admin*, all available features can be used and permissions to *User* can be restricted.
If you want the software to remember your Access code, check the box ***Remember***. When connecting next time, you won't be prompted for password again.

7. Select the branch named ***Main*** and set the required parameters:

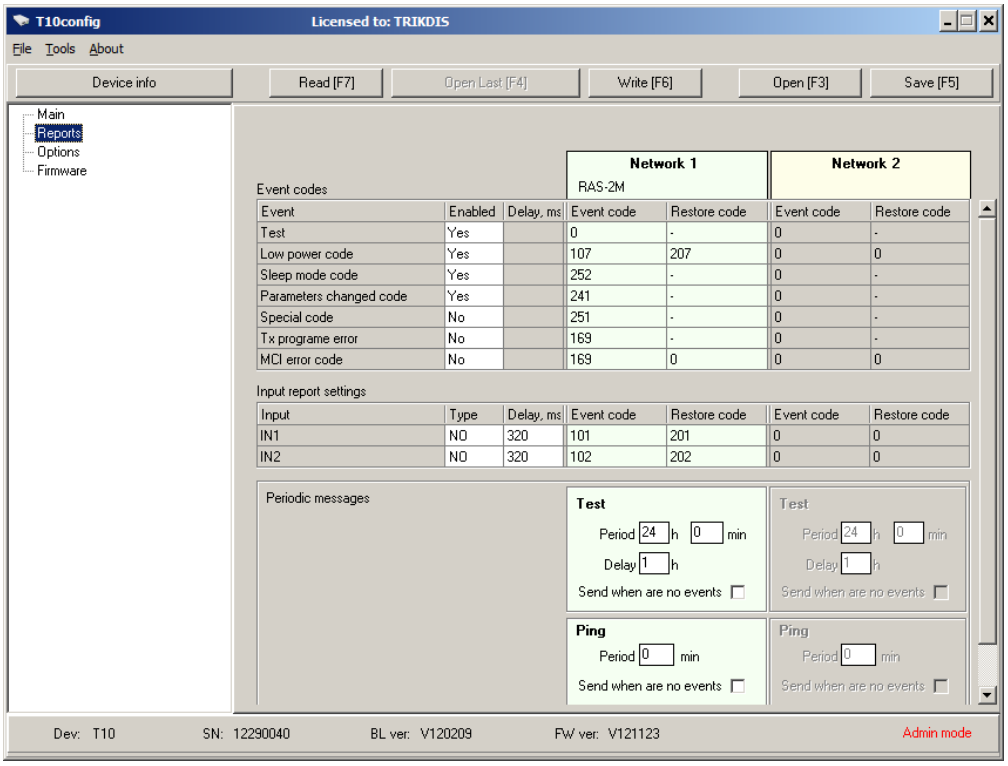


Main window then connected as *Admin* user.

User password	*User* user's password box. In case of logging in with *User* password, program will show only the features that are identified by *Admin* user. To change this password, click ***Change*** button next to the box and in newly opened window enter desired value.
Admin password	Admin user's password box. In case of logging in with the password of *Admin*, all the parameters of the transmitter can be changed, that are allowed by license. To change this password, click ***Change*** button next to the box and in newly opened window enter desired value; See **Annex. Configuration of authorization and access restricting for another user**.
Network	Check the *Network* box to enable other fields of transmission parameters. If both *Network* boxes are checked and the transmission parameters are set correctly, transmitter will be transmitting in two radio channels.
RR	RR box has to be checked if there is a need for transmitter to operate in retransmission mode.
RF Protocol	The list of broadcasting protocols. Select the encryption protocol compatible with the radio receiver. If the transmitter is set to any other protocol than *RAS-3_CID,* then the received *ContactID* message will be converted to manufacturer's predefined UNI code. Conversion table can be seen in the ***Tools*** menu option under ***CID to UNI table…*** and by clicking ***Read [F7]*** in newly opened window. In the conversion table, symbol "?" means any decimal number (0-9). Edit the table only when necessary. The table is loaded into the transmitter memory by clicking ***Write [F6]*** button. By clicking ***Save [F5]*** button, conversion table will be saved to PC; clicking ***Load*** button will load file into the software.
Account ID	Field for entering transmitter's object identifier.
Identification	Field for selecting which identification (id) number has to be attached to the message for the use in monitoring software to recognize the transmitter. There is three options: object ID or transmitter authentic serial number SN, or both.
System	Field for entering radio subsystem number.
RF name	List for selecting names provided to radio frequencies. Radio frequencies and their name list can be found in **Options / Available radio frequencies**.
Power	List for selecting transmission power. There is two options: 1.5 or 5 W.
Event transmit… time(s)	List for selecting the number of broadcasts for same message.
Test event transmit … time(s)	List for selecting the number of *Test* broadcasts.
Security panel	From this list can be selected the *interface* of control panel model which is connected to *T10, T10U* transmitter. If *C11, C14, C15* or *CZ6* interface is connected – select ***INTERFACE Cx*** from the list.

8. Transmitter parameters in ***Reports*** branch.

To change the settings each field should be double-clicked with a mouse left button and in newly opened window desired values should be entered:



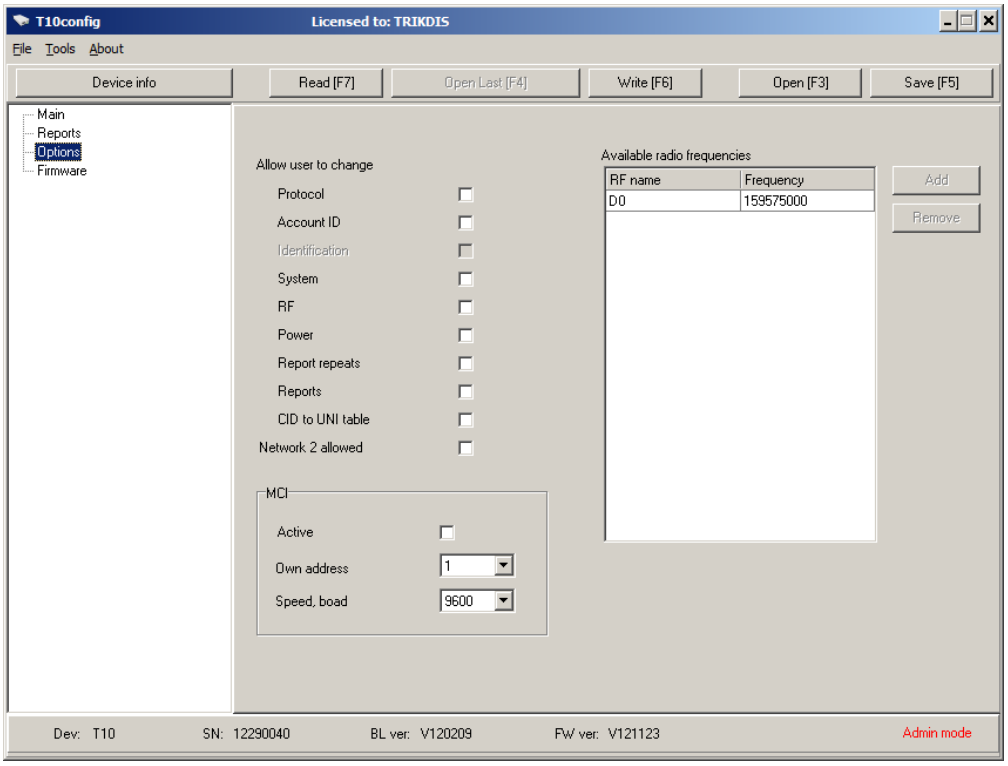
Reports window then connected as *Admin* user.

Event codes Area for setting parameters of transmitter events.
Test – this row is for setting *Test* message sending parameters: send/don't send *Test* message; *Test* event code which will be broadcasted via first and second radio frequency.
Low power – this row is for setting parameters of power supply events: send/don't send message; too low voltage (less than 11.5 V) event code and restore to operating condition (over 12.6 V) event code via first and second radio frequency.
Sleep mode code – this row is for setting parameters of *sleep* mode events: send/don't send message; event code when voltage falls below 10 V threshold via first and second radio frequency.
Parameters changed code – this row is for setting parameters of transmitter parameter changes event: send/don't send message; event code for sending via first and second radio frequency.
Special code – this row is for setting parameters of repeaters network testing code: send/don't send message; event code for sending via first and second radio frequency.
If there is a need to send *Special code* message it has to be enabled by setting *Yes* in ***Enabled*** field. To send a *Special code* message just press on the ***Service*** button. The *Test* message will follow the *Special code* message.
Tx programe error – this row is for setting parameters of transmitter's internal error event: send/don't send message; event code for sending via first and second radio frequency.

Input report settings Area for setting parameters of inputs and inputs event reporting.
Transmitter inputs IN1, IN2 event description field.
Type – type of input circuit (NC/NO/EOL);
Delay – minimal trigger's exposure time (ms);
Event code – IN input circuit triggering event code and ***Restore code*** – IN input circuit restore to its original state event code for sending via first and second radio frequency.

Periodic messages Area for setting parameters of *Test* and *PING* messages.
Period - *Test* message broadcasting period (hr. and min.);
Delay – delay for sending the first *Test* message (hr.) after powering on the transmitter;
Send when are no events – *Test* message will be sent only when there will be no events generated during the set ***Period.***

9. Choose ***Options*** branch and set preferred parameters:



Option window then connected as *Admin* user.

Allow user to change The list of *User* available parameters. *User* will be allowed to change only the marked operating parameters, which were enabled by *Admin* user.

Available radio frequencies The table of available radio frequencies. The necessary radio frequency can be chosen by name selecting in ***Main / RF name*** parameter field. If you need to supplement the table, click ***Add*** button. In newly opened window, type the name of radio frequency, its meaning in Hz and click ***OK*** if it is allowed by a licence.

10. After entering the desired transmitter settings values, click the button ***Write [F6]*** and the transmitter T10 will be loaded with these.
11. Disconnect USB cable from transmitter.

Save [F5] When clicking the button all settings and values from *T10config* fields can be stored on your computer in file with .cfg extension. This file can be opened by clicking ***Open [F3]*** button and can be used as a template for programming other transmitters.

Restore [F11] The button is used for restoring default settings of the transmitter. After query window appears, click ***OK*** button.

7.2. Restore to factory default settings

There is an option to restore factory setting to the transmitter:

1. Complete items 1-4 as described in the chapter **Setting of operating parameters**.
2. Click ***Restore [F11]*** button. After query window appears, click ***OK*** button.

8. Firmware update

As manufacturer improves performance of its transmitters new updates are released. It is possible to update previously purchased transmitter's firmware:

1. Download the latest T10R_vx.xx.fw file from www.trikdis.com website.
2. Complete items 1-4 as described in the chapter **Setting of operating parameters**.
3. In *T10config* software select the branch named ***Firmware***, then load from PC earlier saved *T10R_vx.xx.fw* file.
4. Click ***Start [F9]*** button. In newly opened query window, enter *Admin* access code and click ***OK*** button. Firmware update process is finished only when a progress bar is fully filled up. Disconnect USB cable from transmitter.

Annex. Configuration of authorization and access restricting for another user

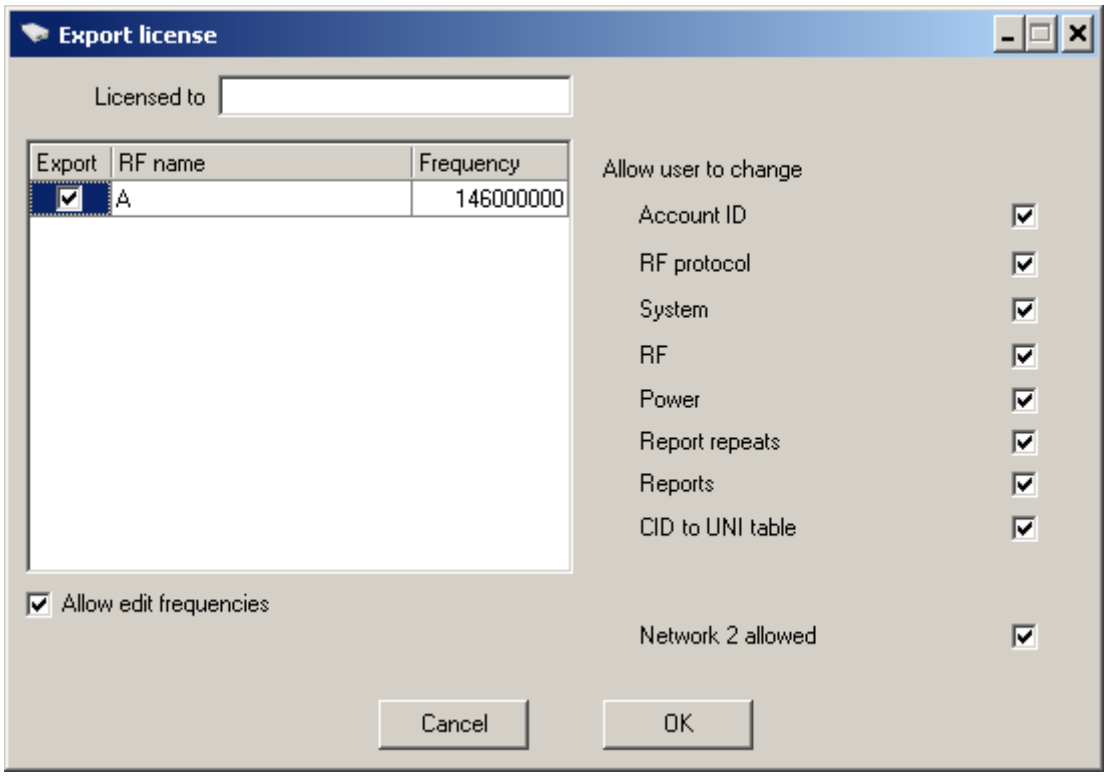
It is possible to restrict access for other users and allow them to change only desired part of operating parameters. About software access restriction see **Setting of operating parameters with T10config software**.

***User* permissions setting:**

Admin can set the *User* password in the ***Main*** branch and access restrictions in ***Settings*** branch. *Admin* can allow *User* to change only part of the transmitter parameters by checking only appropriate boxes in ***Options*** / ***Allow User to change*** list.

Any user of the software can give to another user as many rights as he has (or less) and create license file.

License file is created from menu by command ***File/Export***. In newly opened ***Export license*** window other user's rights can be restricted.



Licensed to	The field for entering customer's name. It will be displayed in main window title.
Export	The table is for selecting particular frequencies which will be available to *User*.
Allow edit frequencies	If checked, other user of software will be able to edit the table ***Available radio frequencies (***Catalog branch ***Options)***.
Allow user to change	Other software user will be allowed to change only the parameters marked with a tick.

When the button ***OK*** is clicked, the window ***Save As*** will be opened. New file name should be given and desired folder selected. Newly created license file is saved by the clicking button ***Save***.