



Pinpad self-service terminal

for petrol stations

TECHNICAL GUIDE

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REVISION HISTORY

REVISION	DATE	BY	SECTIONS	DESCRIPTION
R01	2017.02.27	Evgeniy Vasyliov	All	First release
R02	2018.11.23	Evgeniy Vasyliov	All	Updated format

PURPOSE OF THE DOCUMENT

This Technical Guide is intended for studying of Pinpad self-service terminal for petrol stations. It contains basic information regarding its:

- technical characteristics
- operation
- configuration

Due to a reason that Pinpad terminal firmware is constantly being developed in direction of improvement of its possibilities, changes are possible in final version, which are not described in given Technical Guide.

During the system development process given Technical Guide is also expanded and updated and new chapters are added. Latest version of this Technical Guide can be downloaded from the Pinpad terminal web-page: <http://technotrade.ua/pinpad-terminal.htm>.

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All technical questions regarding the Pinpad terminal are welcome to be asked on support mailbox: support_1a@technotrade.ua. Our support team will be glad to help you.

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APPOINTMENT

Pinpad self-service terminal – is a self-service terminal intended for provision of self-service at petrol stations. It has wired/wireless communication and is equipped with a built-in display, keyboard, RFID-reader (Mifare/Em-Marine standards) and Wi-Fi module, which allows it to be used for following purposes:

- preset of order to be dispensed from fuel dispensers
- payment using fuel cards
- check fuel card account balance
- input of customer's additional data (vehicle plate number, customer name, etc)
- command to print (reprint) receipt
- identification of fuel attendants
- self-service at petrol station

Pinpad terminal can be equipped with the following readers:

- RFID reader of Em-Marine type
- RFID reader of Mifare type
- reader of cards with magnetic stripe
- bar-code scanner

Communication with Pinpad terminal is possible to perform using wired Ethernet connection or wirelessly over Wi-Fi (in case if the terminal is equipped with Wi-Fi module).

The Pinpad terminal is a passive device and is to be used together with a control system for petrol station (for example a POS system or forecourt controller), which gives the following advantages compared to “traditional” way of petrol station operation, equipped only with POS system:

- decreasing of time on customer service due to remote identification and automated processing of requests on fuel dispensing
- simplification of settlements between petrol station and corporate customers using fuel cards
- reinforcement of fuel consumption control by corporate customers, exclusion of misuse possibilities

One Pinpad terminal can be configured to service all fuel dispensers or any particular fuel dispenser. Sequence of customer servicing by Pinpad terminal (operation algorithm) is programmed inside the control system, which is responsible for management over the information indicated by the Pinpad terminal and its actions.

Pinpad terminal serves as a network device having a unique IP-address within the network. Power of separate transceiver is not more than 10 W, which in most cases allows to apply the terminal without necessity to get any licenses. Communication with Pinpad terminal is encrypted and protected from unauthorized using a standard encryption-decryption method.

Besides petrol station the Pinpad terminal can be applied for provision of wireless identification of fuel attendants or corporate customers on other industrial, trade or transport sights.

TECHNICAL SPECIFICATIONS

Technical characteristics

Nominal voltage of terminal board power supply	+12 V DC
Nominal voltage of power supply for keyboard, RFID-readers, Volts	+3.3 V DC
Presence of protection from reversal of input voltage	present
Consumed power, not more than, W	5

Parameters of communication interface

Ethernet transmission	10/100 Mbps
WLAN frequency, MHz	2400
WLAN specification	IEEE 802.11bgn
Transmission protocol	UDP

Characteristics of case

Level of protection	IP54
Overall dimensions. mm	220 x 170 x 50
Weight, not more than, kg	2

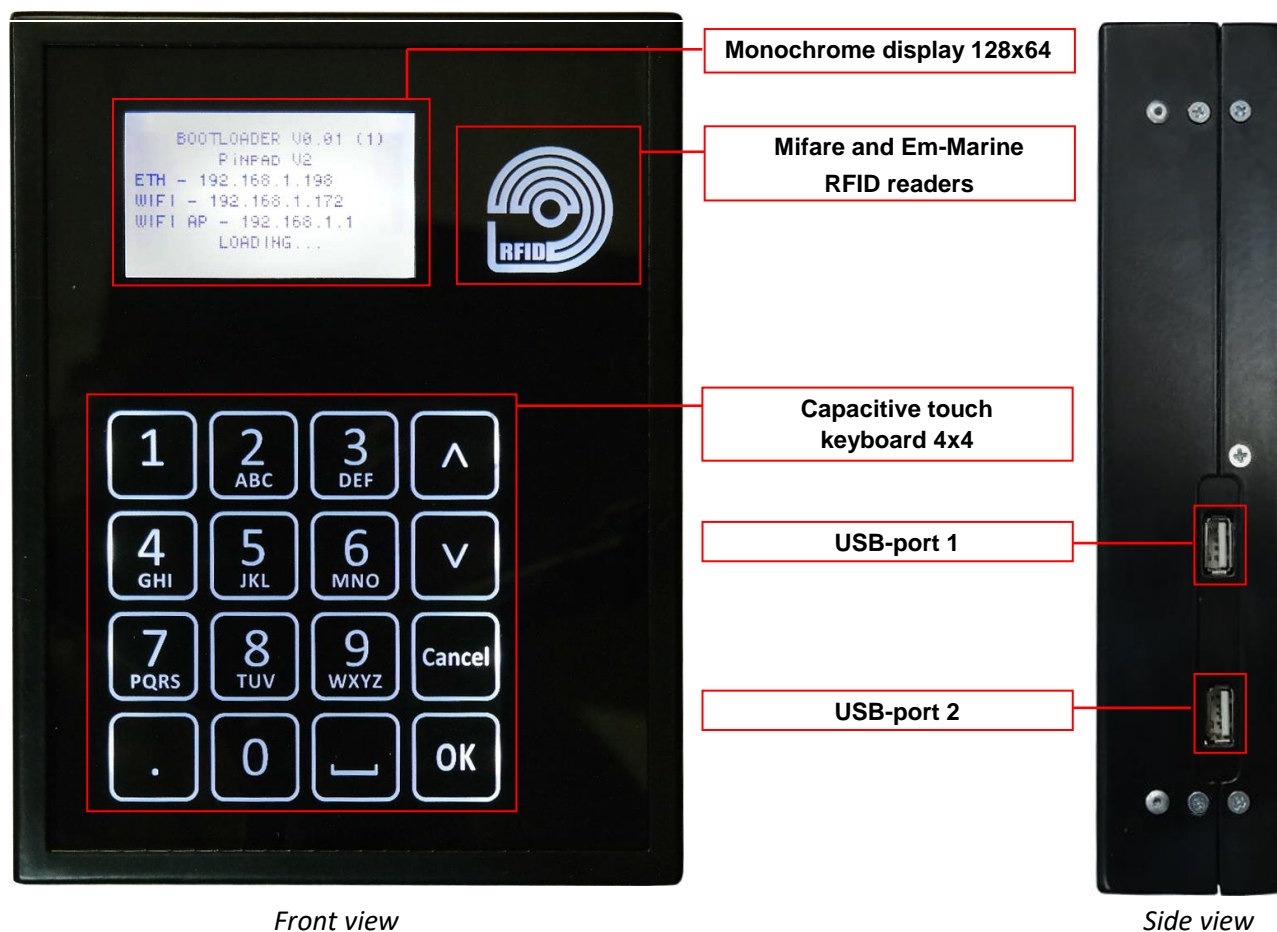
Terms of application

Environment temperature	from -20 till +60°C
Upper limit of relative humidity	95% at 35°C*
Atmospheric pressure	from 84 till 107 kPa (from 630 till 800 mm Hg)

* Notice! And lower temperatures without condensation

STRUCTURE AND OPERATION

Construction of terminal

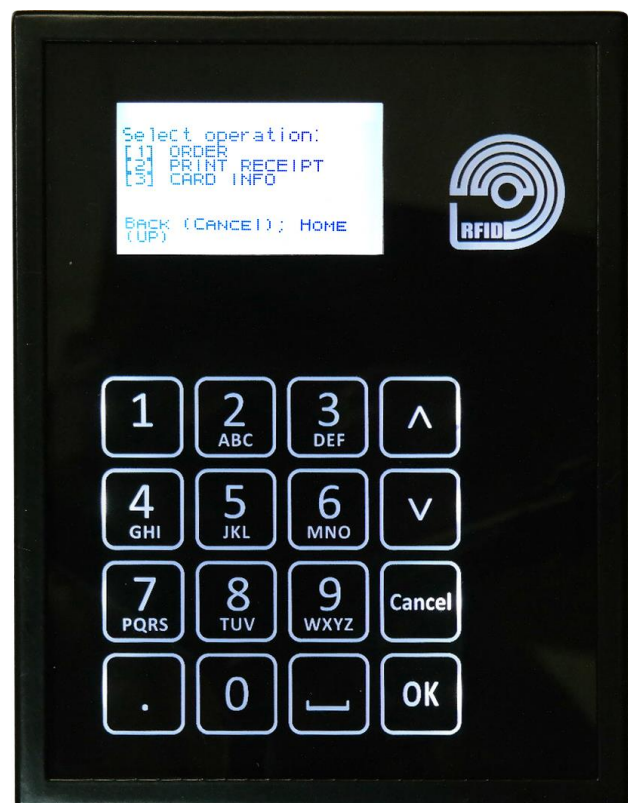
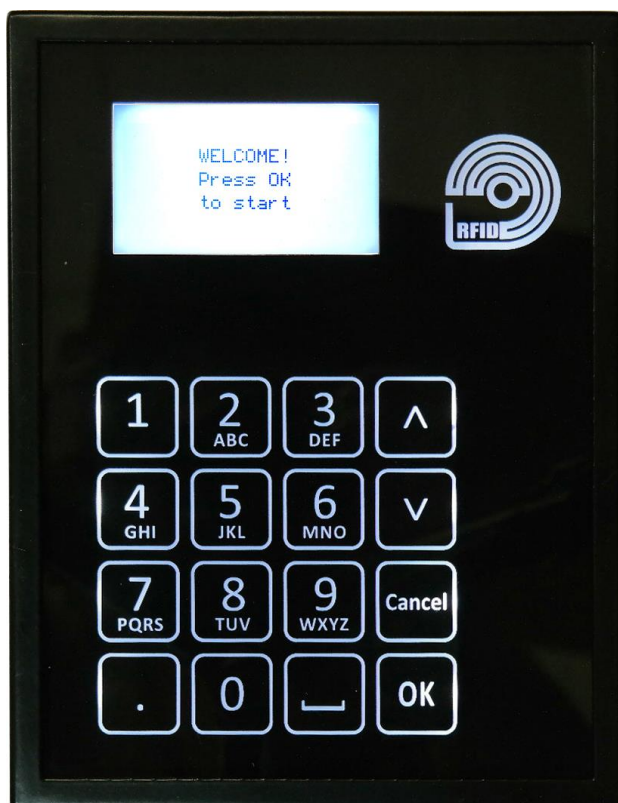


Pinpad terminal is performed in metal casing with vandal-proof execution. Due to rectangle construction of casing it is possible to mount device to dispenser pumphead from any side using a bracket (16) with screw mounting, situated on side surface of casing chassis. Connection of power supply cable of terminal with voltage +12 V DC is performed through a hermetic input situated on bottom of mounting bracket. Metal casing is painted in black color using powder painting technology. Coating ensures 100% protection from moisture, corrosion, exposure by sunlight and household chemicals. All metal parts have protective covering. All means for indication, identification and user input are situated on the front panel of the terminal and protected by 5 mm thick glass.

Input-output means of terminal



Output of text information is performed using a graphical display with resolution 128 x 64 pixels. Brightness and saturation of display provide well reading of display at direct sunlight.



Input of user data is performed using:

- capacitive touch keyboard with the 16 buttons (4 x 4)
- RFID-reader of contactless cards of Mifare type
- RFID-reader of contactless cards of Em-Marine type
- additional readers connected to USB-ports 1 and 2

Touch input using keyboard is provided by touching the buttons fields with bare fingers of subscriber or through winter mittens with thickness not exceeding 5 mm.



At power-up the terminal's display shows:

- currently configured terminal IP-address for Ethernet connection
- currently configured terminal IP-address for Wi-Fi connection
- IP-address of Wi-Fi connection access point
- bootloader version

Internal parts

Internally the terminal consists of the following parts:

- mainboard
- keyboard
- reader RDM6300 for processing Em-Marine type of identifiers
- reader MFRC522 for processing Mafire type of identifiers
- LCD display
- Wi-Fi module
- USB-ports board



Inside view



Mainboard

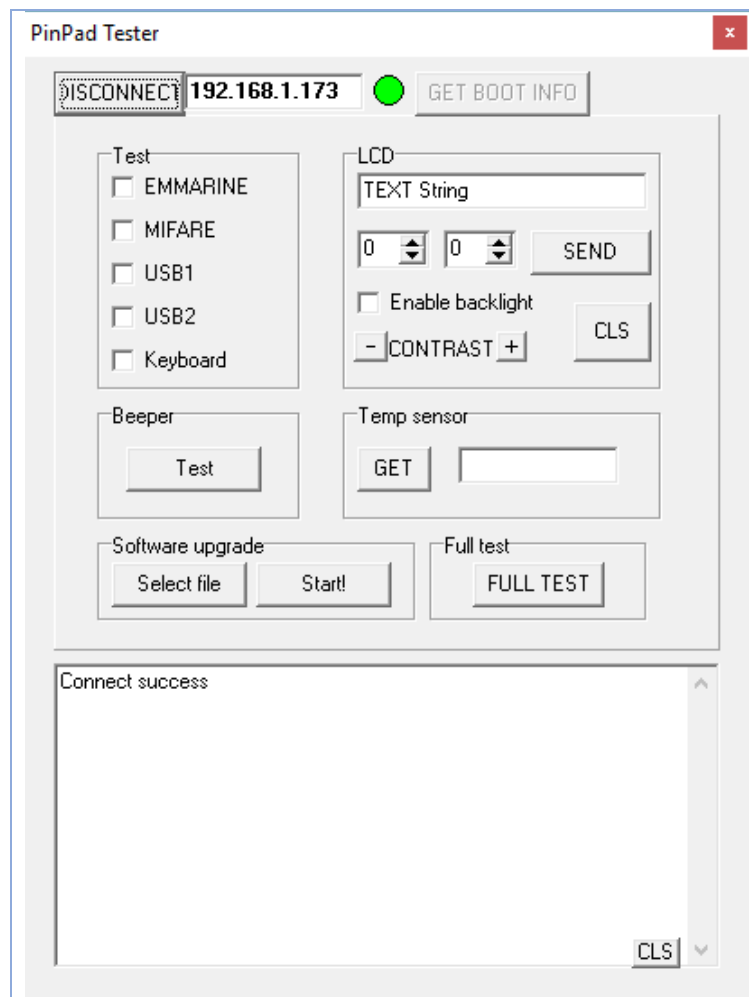
The Ethernet cable is coming into the terminal case through the cable gland located in the bottom of the case.

SOFTWARE AND UTILITIES

PinPad_Tester

This utility is used for testing the Pinpad terminal. It allows to perform the following operations:

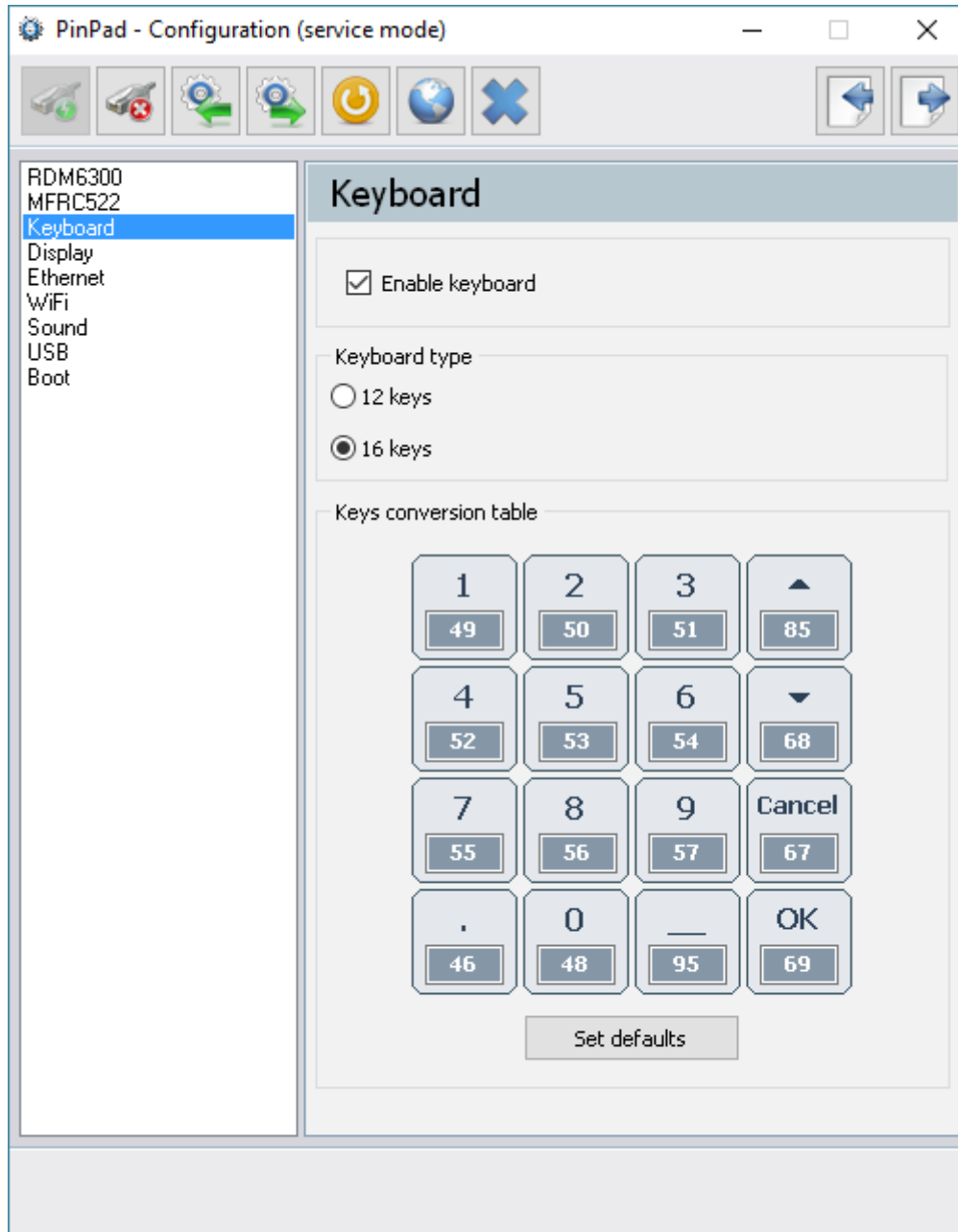
- test operation of readers (Em-Marine type, Mifare type or readers connected to USB-ports 1 and 2)
- test keyboard operation
- test beeper operation
- test LCD display and its contrast
- test temperature sensor
- provide software upgrade from the file



Information on results operations provided is shown in the logging field.

PinPadConfigTool

This utility is used for configuration of the Pinpad terminal.



It allows to perform the following operations:

- Allows to perform configuration of the terminal:
 - reader RDM6300 for processing Em-Marine type of identifiers
 - reader MFRC522 for processing Mafire type of identifiers
 - keyboard
 - LCD display
 - Ethernet
 - Wi-Fi
 - sound
 - USB-ports appointment
 - start-up screen

2. Allows to restart the terminal remotely.
3. Has localization to various languages:
 - English
 - Russian
 - Ukrainian

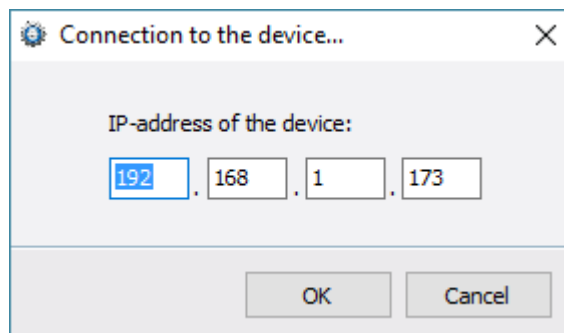
Control panel of the utility has the buttons for management over the utility:



Appointment of the buttons:

#	Description	Shortcut
1	Connection to device	Ctrl + J
2	Disconnection from device	Ctrl + L
3	Read configuration	Ctrl + R
4	Write configuration	Ctrl + S
5	Restart device	Ctrl + R
6	Change language	Ctrl + O
7	Exit utility	Ctrl + Q
8	Import settings from file	Ctrl + I
9	Export settings to file	Ctrl + E

For connection to terminal it is needed to press button [1]. A dialog for connection to device will be shown, in this dialog it is necessary to input IP-address of the terminal (it is shown on start-up of the terminal) and press OK button.



If the terminal is powered on and connected to the network – then the utility automatically reads all its settings and enable fields to settings. Otherwise an error is shown.

For disconnection of the terminal press button [2].

After changing all the needed settings it is necessary to write all configuration to terminal. Writing of configuration is done by pressing button [4].

Some settings take action only after restarting of the terminal, for restart of the terminal press button [5]. After changing of network settings and attempt to write them into terminal a dialog with a request to restart the terminal is shown.

For access to service functions (conversion of keys codes, settings of Wi-Fi in modes "Station" and "Access point", import/export to configuration file) hold together keys Ctrl + Shift + F12.

All settings of the terminal are stored in INI-file with name « DefConfig.ini»:

Section	Identifier	Type	Description
RDM6300	State	Integer	State of RDM6300 reader - "0" - Off - "1" - On - "2" - Autodetect
MFRC522	State	Integer	State of MFRC522 reader - "0" - Off - "1" - On - "2" - Autodetect
Keyboard	Type	Integer	State of keyboard - "0" - Off - "1" - 12 keys - "2" - 16 keys
Keyboard	ConvertTable_OK	Integer	Code of "OK" key
Keyboard	ConvertTable_Cancel	Integer	Code of "Cancel" key
Keyboard	ConvertTable_Down	Integer	Code of "Down" key
Keyboard	ConvertTable_Up	Integer	Code of "Up" key
Keyboard	ConvertTable_1	Integer	Code of "1" key
Keyboard	ConvertTable_4	Integer	Code of "4" key
Keyboard	ConvertTable_7	Integer	Code of "7" key
Keyboard	ConvertTable_Point	Integer	Code of "." key
Keyboard	ConvertTable_0	Integer	Code of "0" key
Keyboard	ConvertTable_8	Integer	Code of "8" key
Keyboard	ConvertTable_5	Integer	Code of "5" key
Keyboard	ConvertTable_2	Integer	Code of "2" key
Keyboard	ConvertTable_Space	Integer	Code of "Space" key
Keyboard	ConvertTable_9	Integer	Code of "9" key
Keyboard	ConvertTable_6	Integer	Code of "6" key
Keyboard	ConvertTable_3	Integer	Code of "3" key

LCD	Type	Integer	State of display: - "0" - Off - "1" - ST7568
LCD	Backlight	Integer	State of backlight: - "0" - Off - "1" - On - "2" – Autodetect
LCD	Contrast	Integer	Value of contrast (0..31)
Ethernet	IP	Integer	IP-address of Ethernet interface
Ethernet	Mask	Integer	Mask of Ethernet interface
Ethernet	Gateway	Integer	Gateway of Ethernet interface
Ethernet	Port	Integer	Port of Ethernet interface
WiFi	State	Integer	State of Wi-Fi module: - "0" - Off - "1" - On - "2" – Autodetect
WiFi	IP	Integer	IP-address of Wi-Fi interface
WiFi	Mask	Integer	Mask of Wi-Fi interface
WiFi	Gateway	Integer	Gateway of Wi-Fi interface
WiFi	Port	Integer	Port of Wi-Fi interface
WiFi	StationMode	Integer	Station mode of operation: - "0" – Off - "1" - On - "2" – Autodetect
WiFi	StationSSID	String	Station SSID (should contain only alphanumeric symbols)
WiFi	StationPass	String	Station password (should contain only alphanumeric symbols)
WiFi	AccPointIP	Integer	IP-address of router for "Access point" mode
WiFi	AccPointSSID	String	Access point SSID (should contain only alphanumeric symbols)
WiFi	AccPointPass	String	Access point password (should contain only alphanumeric symbols)
Buzzer	State	Integer	State of buzzer: - "0" - Off - "1" - On - "2" – Autodetect
USB	State	Integer	State of USB-ports: - "0" – All USB-ports are off - "1" – USB-port 1 is enabled - "2" – USB-port 2 is enabled - "3" – Both USB-ports are enabled
Boot	Text	String	Welcome message

All settings of the utility are stored in INI-file with name «CTConf.ini»:

Section	Identifier	Type	Description
GEN	LastIP	Integer	Last entered IP-address of the terminal
GEN	Lang	Integer	Identifier of GUI language: - "0" - Autodetect - "1" - Ukrainian - "2" - Russian - "3" – English