PERCo®

Electromechanical Box Tripod Turnstile with Automatic Anti-Panic Arms and Capability of Additional Equipment Installation

TTD-10A

ASSEMBLY AND OPERATION MANUAL

CE EAC

Electromechanical Box Tripod Turnstile with Automatic Anti-Panic Arms and Capability of Additional Equipment Installation

TTD-10A

Assembly and Operation Manual

CONTENTS

Dear Customer,

Thank you for purchasing the PERCo turnstile. Please follow the instructions given in the Manual carefully, and this quality product will provide many years of trouble-free use.

Assembly and operation manual for the TTD-10A electromechanical tripod turnstile with automatic anti-panic folding arms and capability of additional equipment installation (hereinafter - the *Manual*) contains data that is necessary for the fullest use of operating advantages of the turnstile as well as chapters on packaging, installation and maintenance.

Only qualified personnel, following the instructions of this Manual, must carry out installation and maintenance.

Abbreviations:
- ACS — access control system;
- RC-panel – remote control panel;
- WRC – wireless control panel;
- CLB – control logic board;
- FRT – face recognition terminal.

1   APPLICATION

The **TTD-10A electromechanical box tripod turnstile with automatic anti-panic folding arms and capability of additional equipment installation** (hereinafter - the *turnstile*) is designed for the organization of a two-way access point to the controlled area. A distinctive feature of this product is its modularity, which makes it possible to integrate a wide range of additional equipment into the turnstile: card capture reader, coin acceptor, proximity card readers, biometric readers, barcode readers, alcohol detector etc.

In order to build the majority of optional equipment types in, there is a standard **TTD-10AB** modification of the turnstile. Besides, there are modifications with inbuilt card capture reader **TTD-10AC** and inbuilt coin acceptor **TTD-10APE** (for EUR).

> ⚠️ ***Attention!***
> RFID-reader for proximity cards is not included into the set of built-in card capture reader, it should be purchased and installed by the customer himself inside the turnstile side module on a special bracket.

Housing of the turnstile is made of stainless steel. Outdoor application is allowed (in standard version **TTD-10AB**).

To ensure fast and convenient passage it is recommended to install one turnstile per 500 people working the same shift, and on the basis of maximum working load 30 persons / min (see Chapter 3) for information on the throughput capacity of the turnstile.

2   OPERATION CONDITIONS

The turnstile with regard to resistance to environmental exposure complies with GOST15150-69, category N1 (for an outdoor application).

Operation of the turnstile in standard version **TTD-10AB** (without a card capture reader / coin acceptor) is allowed at ambient air temperature from –20°C to +50°C (when used under the canopy – to + 55°C) and at relative air humidity of up to 90% at +30°C.

The modification with built-in card capture reader **TTD-10AC** or built-in coin acceptor **TTD-10APE** can be operated indoors at ambient air temperature from +1°C to +55°C and at relative air humidity up to 95 % at + 25°C.

> ⚠️ ***Attention!***
> When installing other additional equipment, the installer must take into account the operating conditions of the installed equipment.

The RC-panel, included in the standard delivery set, with regard to resistance to environmental exposure complies with GOST15150-69, category NF4 (operation in premises with climate control).

Operation of the RC-panel is allowed at ambient air temperature from +1°C to +40°C and at relative air humidity of up to 80% at + 25°C.

3   TECHNICAL SPECIFICATIONS

Operating voltage.. 12±1.2VDC
Consumption current.. max. 7.0 A [1]
Power consumption .... max. 84 W [2]
Throughput rate in a single passage mode .... 30 persons/min
Throughput rate in a free passage mode .... 60 persons/min
Passage width .... 560 mm
Barrier arm rotation force .... max. 3 kgf
RC-panel cable length [3] .... min. 6.6 m
Card container capacity [4] .... 350 card
Coin container capacity [5] .... not less than 2 000 coins
Ingress Protection Rating (EN 60529):
   standard version **TTD-10AB**... IP55
   with built-in card capture reader **TTD-10AC** IP41
   with built-in coin acceptor **TTD-10APE**... IP41
Electric shock protection class .... III (IEC 61140)
Mean time to failure .... min. 4,000,000 passages
Mean lifetime .... 8 years
Overall dimensions (L × W × H) .... 1361×750×1024 mm
Net weight of the turnstile .... max. 100 kg

4   DELIVERY SET

4.1   Standard delivery set

Box №1. Main housing *TTD-10A*

Turnstile main housing with hub and barrier arms.. 1
Main cover lock key 2
RC-panel with cable.. 1
Installation tools:
   Screw M5×12 4
   Spring washer 5 4
   Enlarged flat washer 5 4
   Self-adhesive cable tie mount 3
   Nylon cable tie 100 mm 6
   Self-adhesive PCB pillars FSS-5 4
Technical documentation:
   Certificate 1
   Assembly and operation manual 1

Box №2. Side modules

TTD-10AB (standard version):

Standard side module, right 1
Standard side module, left 1
Sealing rubber profile 2

TTD-10AC (version with built-in card capture reader):

Side module with built-in card capture reader, right 1
Key of the container of the card capture reader 2
Standard side module, left 1

---

[1] It is recommended to use 12 VDC (max. consumption current 8A) power supply with linear stabilization of voltage and pulsation amplitude at output not exceeding 50 mV.

[2] The power consumption can rise to 84W within 5 sec. after power up or at taking off the *Fire Alarm* signal. In normal state the power consumption is no more than 40 W.

[3] Max. allowed cable length – 40 m (supplied on request).

[4] For turnstile version with built-in card capture reader **TTD-10AC**.

[5] For turnstile version with built-in coin acceptor **TTD-10APE**.

TTD-10APE (version with built-in coin acceptor):

Side module with built-in coin acceptor, right 1
Key of the cover of the coin acceptor 2
Key of the container of the coin acceptor 2
Standard side module, left 1
Cable WEL-R7U06 for connecting the coin acceptor to the computer 1

In separate packings:

C-10 side cover with installation kit .... 2 or 1[1]

⚠️ **Attention!**

Side covers are a separate item in the price list and are purchased separately, the type of cover is chosen by the customer when ordering the turnstile. Types of side covers and their application are shown in Table 1. Design and dimensions of different types of covers - see Appendix 1.

Table 1. Types and application of serially produced side covers for TTD-10A turnstiles

Type	Design	Application
C-10B	from stainless steel	without additional functions
C-10R	with a window from radio-transparent material	for built-in RFID reader installation
C-10P.1	with a rack and a window made of radio-transparent material	for installing the built-in RFID reader and **BS10**, **BS11** brackets for additional equipment
C-10P.2	with a rack and a window made of radio-transparent material	for installing the built-in RFID reader and **BS7**, **BS8**, **BS9**, **BS12**, **BS13**, **BS14** brackets for additional equipment
C-10Q	from stainless steel and tinted glass with transparent window	for integrated bar code reader installation
C-10F	with a bracket	for biometric reader installation

⚠️ **Attention!**

C-10P.1 and **C-10P.2** side covers differ in rack height and are selected based on the equipment that needs to be installed on it. Cover **C-10P.1** is used for the installation of face recognition terminals (hereinafter referred to as FRT) "**Suprema FaceStation 2**" or "**Suprema FaceLite**", **C-10P.2** cover is used for installation of FRT manufactured by **ZKTeco** and breathalyzers.
Be sure to purchase a rack mount bracket that matches the product you are installing:

Additional equipment	Bracket
"Suprema FaceStation 2" FRT	**BS10**
"Suprema FaceLite " FRT	**BS11**
"ZKTeco FaceDepot 7A" FRT	**BS7A**
"ZKTeco FaceDepot 7B" FRT	**BS7B**
"ZKTeco ProFace X" FRT	**BS8**
"ZKTeco SpeedFace V5" FRT	**BS9**
" Alkobarrier " breathalyzer	**BS12**
"Dingo B-02" breathalyzer	**BS13**
Other types of breathalyzers and FRT	**BS14** (universal)

---

[1] For the **TTD-10AC** version, only one side cover is supplied separately. In the side module with a built-in card capture reader, the side cover with a slot for receiving cards is already installed on manufactured. There is no other type of side cover for this side module.

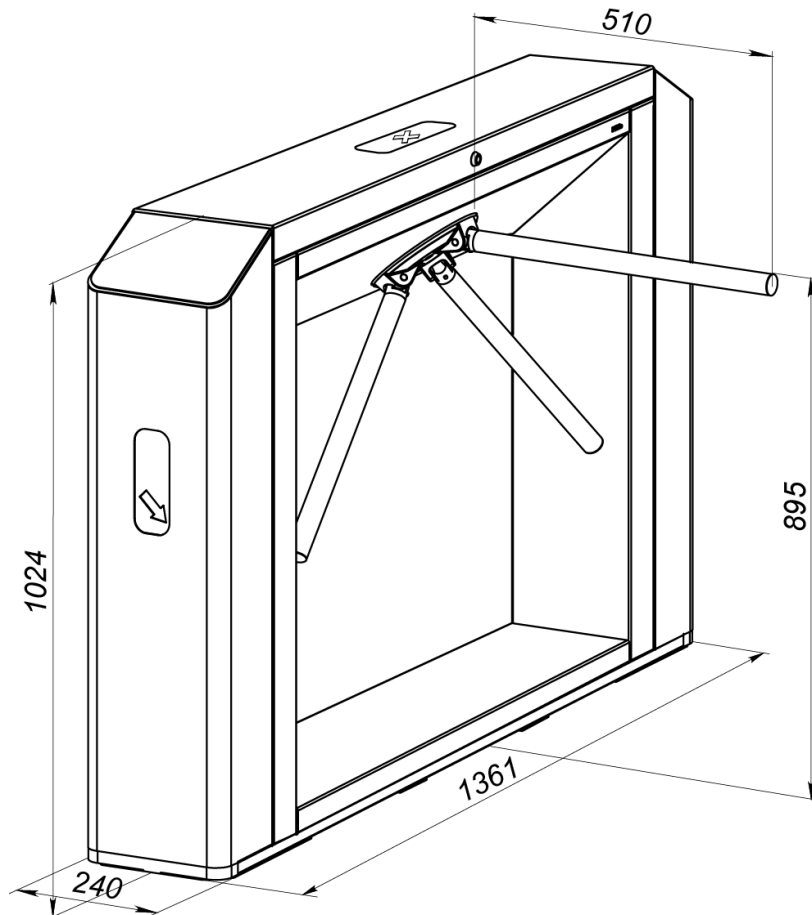## 4.2 Optional equipment supplied on request

Figure 1. Overall dimensions of the TTD-10A turnstile

5 PRODUCT DESCRIPTION

5.1 Main features

- The turnstile is designed either for indoor application or outdoor (see Section 2). Turnstile housing is produced from high quality stainless steel.
- The turnstile can be operated from the RC-panel or WRC as well as from an ACS.
- It is possible to install into the turnstile a wide range of additional equipment using special side turnstile modules (with built-in card capture reader or coin acceptor for corresponding turnstile versions) and special side covers to integrate into the turnstile: proximity card readers, biometric readers, bar code readers, alcohol detector etc.
- The turnstile <u>in the version with the card capture reader</u> ***TTD-10AC*** is equipped with a mechanism for temporary access cards withdrawal when passing through the turnstile and a container for collecting them. The turnstile design allows you to change the location of the card capture reader to organize the passage with the withdrawal of access cards in the required direction.
- The turnstile <u>in the version with the coin acceptor</u> ***TTD-10APE*** is equipped with a coin acceptance mechanism built in the side module and a container for collecting them. The turnstile design allows you to change the location of the coin acceptor to arrange payment for the passage in the required direction. The removable container of the coin acceptor is equipped with a carrying handle and a lid with a lock, to prevent thefts during encashment

---

[1] WRC kit consists of a receiver and transmitters (tags) with operation range up to 40 m.

- The turnstile is equipped with automatic anti-panic folding arms. Automatically free of passageway is performed by bringing the barrier arm into vertical position at a power loss or by «Fire alarm» signal. A purpose-designed «Fire alarm» control input is intended for opening the turnstile at the fire alarm command or from emergency opening button.
- The turnstile houses LED indication display intended for status and passage direction indication. Besides, the turnstile has an extra indication of passage direction/ banned access on its side modules.
- The turnstile has outputs for connection of remote indicators.
- The turnstile has relay outputs for connection of an intrusion detector and a siren.
- There are two modes for the turnstile control — a pulse control mode and a potential control mode.
- After each passage the turnstile provides automatic complete rotation of the barrier arm to home position, i.e. automatic reset.
- After the turn of barrier arm for more than 67º angle its reverse rotation is blocked.
- Smoothness of reset and quiet operation are ensured by a damper.
- The optical arm rotation sensors are built into the turnstile housing to ensure accurate count of inputs to an ACS.
- The turnstile is supplied with safe voltage — maximum 14V.
- Installed in a line several turnstile housings form a secured passage without installation of extra guide barriers.

5.2   Design

The design of the turnstile is shown in Fig. 2. Numbers in brackets correspond to Fig. 2. The overall dimensions of the turnstile housing are shown in Fig. 1.

The turnstile comprises a turnstile housing (1), hub with three barrier arms (5), main cover (2) with indication block (3) and lock (4), two side modules[1] with side indication blocks (7) (permanent indication of passage direction / banned access) and with side covers (8), and RC-panel (10). Fastening of barrier arms to the hub is hinged. The turnstile housing is fixed to floor with 4 anchor bolts through holes in the turnstile housing base.

5.2.1 Main housing

Internal elements of the turnstile housing are accessed through the removable main cover (2). Fastening of the cap to the housing is accomplished with the help of lock (4). During operation of the turnstile main cover has to be locked. Under the main cover there is a bracket with control panel **CLB.140** (further – control panel) and remote connector blocks **XTU1**, **XTU2**, **XTU3** (see Fig. 15). The indication block (3) is also integrated in the turnstile main cover and is connected to the control board with the cover indication cable via the connector block **XTU3**.

The rotation unit of barrier bars takes on the role of the turnstile actuation mechanism. Rotation unit consists of (see Fig. 24):
- control mechanism with optic sensors of barrier arms rotation angle, which helps to register the passage correctly;
- rotation mechanism, which includes:
  - barrier arms resetting unit (pusher, spring and roller), providing automatic reset of barrier arms to the home position after every passage;
  - damper, providing smooth and soft-running work of rotary mechanism;
  - locking device, preventing the possibility of an unauthorized passage;
- electromechanical device for emergency opening of the passageway.

To access the rotation unit of barrier arms, it is necessary to remove the main cover (3) and the bracket of control board.

---

[1] (6) – for standard version **TTD-10AB**, (6) and (13) – for version with built-in card capture reader **TTD-10AC**, (6) and (17) – for version with built-in coin acceptor **TTD-10APE** (ref. Fig. 2).
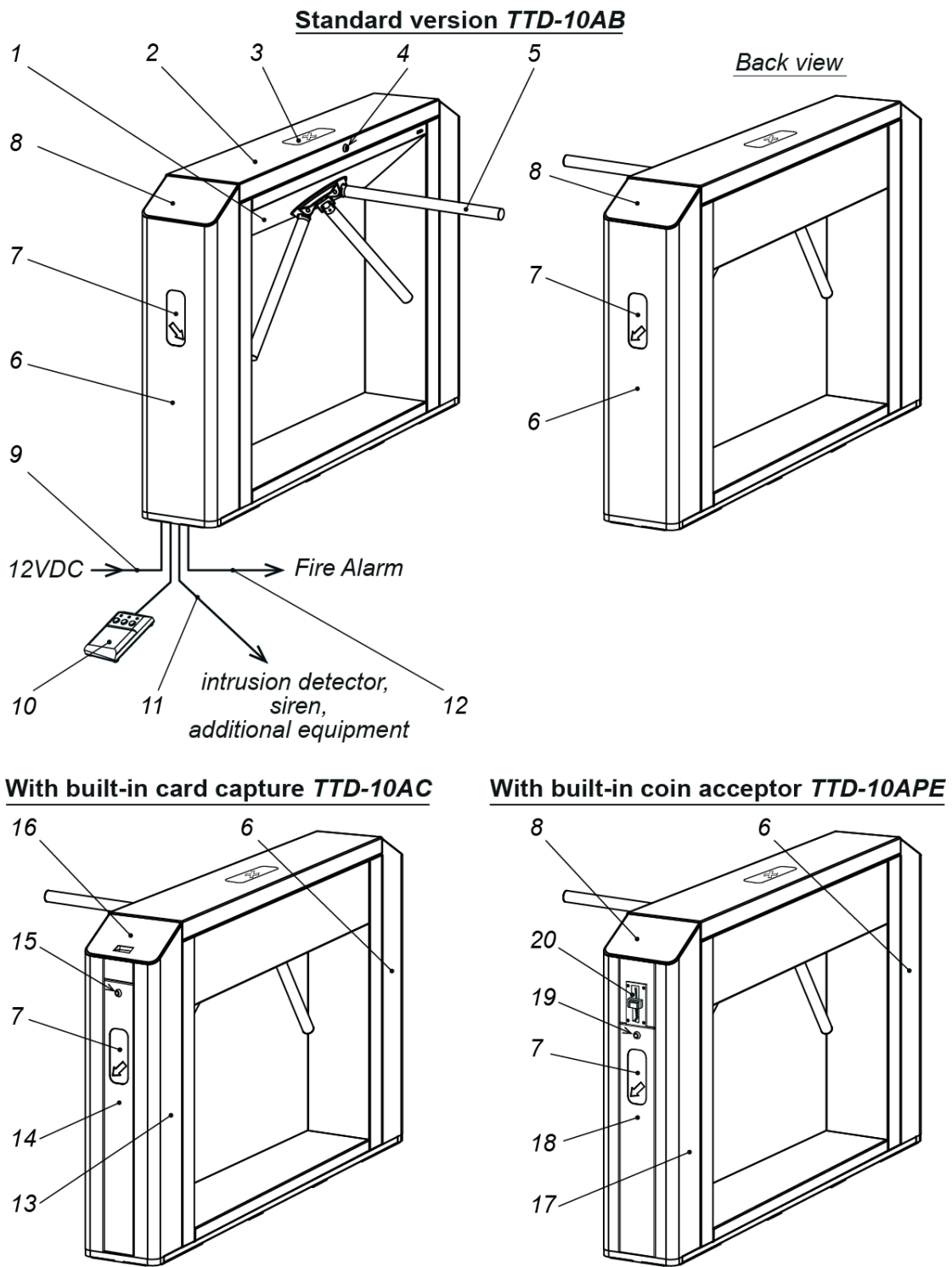
Standard version *TTD-10AB*

Back view

With built-in card capture *TTD-10AC*   **With built-in coin acceptor *TTD-10APE***

Figure 2. TTD-10A turnstile overall view

1 – main housing; 2 – main cover; 3 – main cover indication block; 4 – cover lock; 5 – barrier arm; 6 – standard side module; 7 – side indication blocks of constant indication of the passage direction / prohibition; 8 – side cover[1]; 9 – power supply cable[2]; 10 – RC-panel with cable; 11 – emergency opening device (*Fire Alarm*)[2] cable; 12 – additional devices cable; 13 – side module with built-in card capture reader; 14 – card container cover; 15 – lock of card container cover;16 – side cover with slot for cards; 17 – side module with built-in coin acceptor; 18 – coin container cover; 19 – lock of coin acceptor cover; 20– coin acceptor.

---

[1] The device and purpose of various types of side covers, see Table 1 and in the Appendix 1.
[2] Not included in the standard delivery set.

5.2.2 Side modules

The customer has an opportunity to choose one of the turnstile options. Various versions, differing in the design of the side modules (6, 13, 17), i.e. presence / absence of the built-in card capture reader / coin acceptor, are shown in Fig.2. Side modules are rigidly fixed to the main housing (1). On top of the side modules are installed side covers (8), which can have a different functional application according to their type (see Table 1). Blocks of constant indication of the direction of passage / prohibition of passage are situated on the side modules of the turnstile (see Fig.4). Access to the four holes in the base of the housing for fixing the turnstile to the mounting surface is provided when removing the side modules.

Side module with built-in card capture reader

The side module (13) has a built-in card capture reader mechanism with the **PA-450** control board installed. In the side module under the cover (14), which is fixed in the locked position by the lock (15), there is a card collector with the function of signalization about its filling. The side module is equipped with a side cover (16) with a slot for capturing access cards (the possibility of replacing of this cover with a side cover of another type is not foreseen by the manufacturer). The receiving slot has a LED backlight. Use of the card capture reader is possible only in the ACS. The connection scheme is shown in Fig. 21.

Side module with built-in coin acceptor

A coin acceptor (20) of the **UCA2** type manufactured by **ICT** company is built-in in the side module (17). The coin acceptor is designed to receive coins (tokens) for payment of the passage without an opportunity to give change. The installation of the sorting device is not provided. Using the built-in sensors, the coin acceptor determines the denomination and / or the authenticity of the coin (token). Also, to monitor the number of passages, a pulse counter **Yenox H2-7EA2** is installed in the side module. The coin acceptor and the pulse counter must be used in accordance with the manufacturer's documentation. In the side module under the side cover (18), fixed in the closed position by the lock (19), there is a container (coin collector) with the function of signalization about its filling. The container is equipped with a lid with a lock to prevent theft.

For convenience of connection, the outputs and inputs of the coin acceptor are connected to the remote terminal strip *XTU4*. The scheme of the internal connections of the side module with a coin acceptor is shown in Fig. 23. It is possible to use the turnstile and coin changer without using the ACS. The connection scheme is shown in Fig. 22.

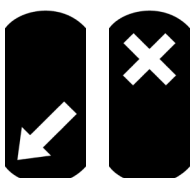### 5.2.3 Indication blocks

Main cover indication block (8) are located in the main housing main cover (9) and inform about the current status and a set mode of the turnstile work (see Fig. 2, 3). The indication block has 3 mnemonic indicators:

– indicator of authorized passage (green arrow)

– indicator of passage denial (red cross)

– indicator of authorized passage in counter direction (green arrow)

Figure 3. Mnemonic indicators of the main cover indication block

Side indication block (7) is designed for showing passage direction through the turnstile. It displays the constant indication (white arrow or red cross):

– indicator of passage denial (red cross)

– indicator, showing the direction of passage (white arrow)

Figure 4. Mnemonic indicators of the side indication block

9

The type of the permanent indication (arrow or cross) is selected when installing the turnstile with the **CROSS** / **ARROW** jumper (see Fig.5), located in the side indication block of the side module next to the indication cable connector.

To access the **CROSS** / **ARROW** jumper, remove the side module (see Fig.15), and in the side modules with the containers (with built-in card capture reader or coin acceptor) open the cover of the container with the key.

With the initial settings, the jumper is installed in an **ARROW** position, which corresponds to the white arrow display.
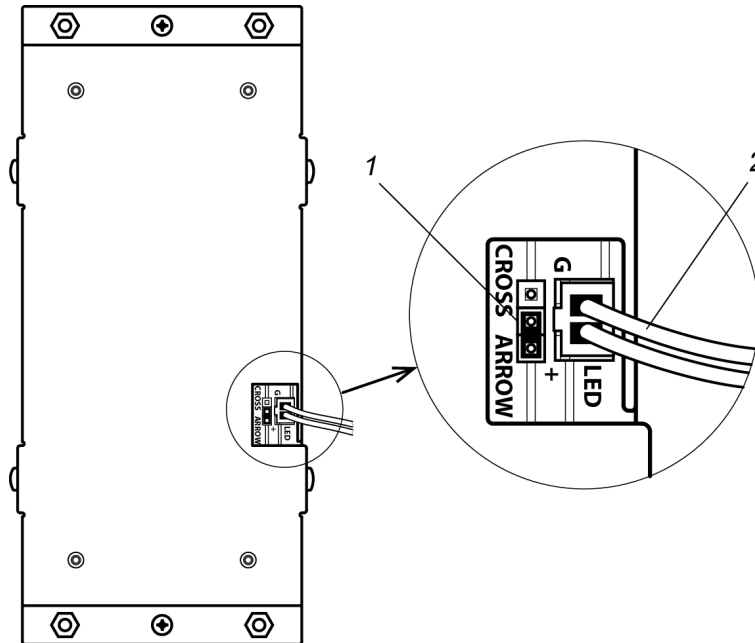
Figure 5. Side indication block (view from inside the side module)
1 – jumper **CROSS / ARROW**, 2 – side module indication cable

5.2.4 RC-panel

The RC-panel (10) is designed as a small desktop device with a shock-proof ABS plastic case and is intended for setting and indicating operating modes when the turnstile is operated manually. The RC-panel overall view is shown in Fig. 6.
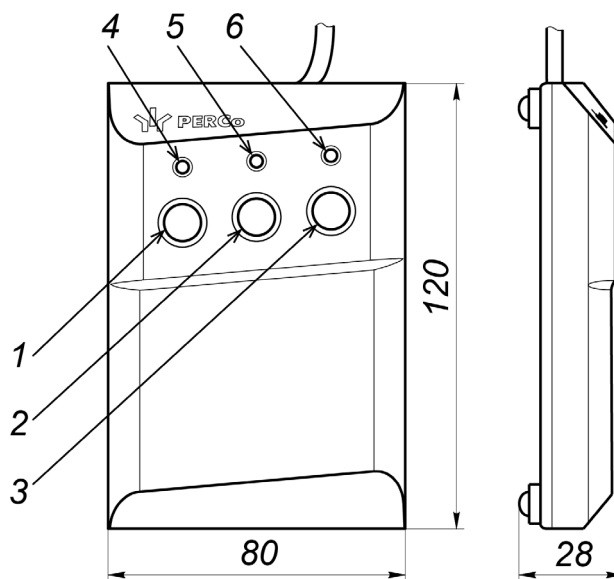
Figure 6. RC-panel overall view

1, 2, 3 – buttons **LEFT**, **STOP**, **RIGHT** for setting the passage mode;
4, 6 – green indicators *«Left»*, *«Right»*; 5 – red indicator *«Stop»*

There are three control buttons on the RC front panel intended for setting the turnstile operating modes. The LED indicators are located above the buttons. The middle button on the RC-panel (hereinafter — the **STOP** button) is intended to set the turnstile to the "Always locked" mode. The left (**LEFT**) and the right (**RIGHT**) buttons are intended to unlock the turnstile for passage in the chosen direction. Control commands and corresponding indication on RC-panel for impulse and potential modes are indicated in Table 6 and 7.

5.2.5 Control Logic Board

Turnstile control board (see Fig. 7) and remote connector blocks **XTU1, XTU2, XTU3** are fixed on the bracket, located inside the main housing. To access the board, it is necessary to remove the turnstile main cover, following the instructions of Section 6.
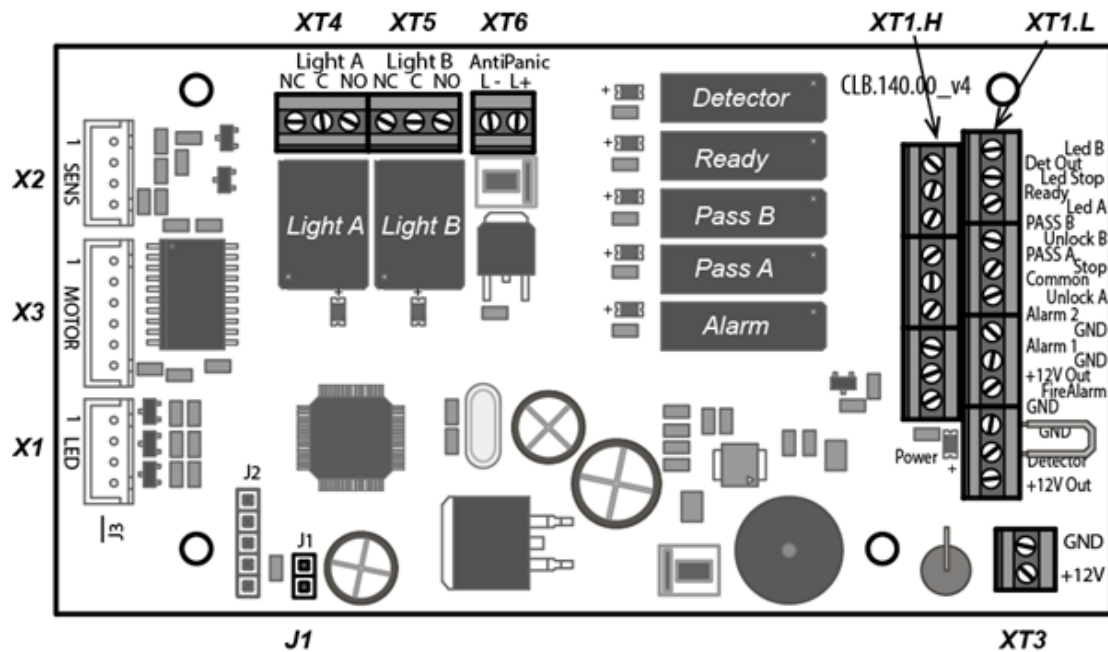
Figure 7. Control Logic Board (CLB)

On control board there is a microcontroller, which processes incoming control commands (inputs "*Unlock A*", "*Stop*", "*Unlock B*" and "*Fire Alarm*"), traces the condition of barrier arms optical sensors and basing on received data generates commands on control unit of the turnstile. Besides, microcontroller generates signals on outputs: for indication on RC-panel (outputs "*Led A*", "*Led Stop*" and "*Led B*"), for outer indication (outputs "*Light A*", "*Light B*"), for passing in a corresponding direction ("*PASS A*" and "*PASS B*"), for turnstile readiness to run the command ("*Ready*"), for alarm ("*Alarm*"), to retransmit the signal of intrusion detector condition ("*Det Out*").

The CLB (Fig. 7) includes:
- **X1** (**LED**), **X2** (**SENS**), **X3** (**MOTOR**) connectors to connect the indication blocks, optical arm rotation sensors and control mechanism with a locking device.
- **XT1.L** (**In**) – connector block to connect the RC-panel / WRC / ACS-controller inputs as well as an emergency opening device (*Fire Alarm*) and intrusion detector (see Clauses 5.3.1, 5.3.2, 5.4.1).
- **XT1.H** (**Out**) – connector block to connect a siren and ACS outputs, providing the turnstile status data to the ACS-controller (see Clause 5.4.1).
- **XT3** (**+12VDC**) – connector block to connect the turnstile power supply.
- **XT4** (**Light A**) and **XT5** (**Light B**) – connector blocks to connect "open/closed" remote indicators, one indicator per each direction (see Clause 5.4.3).
- **XT6** (**AntiPanic**) – connector block to connect the electromagnet of automatic anti-panic opening device.
- **J1** – connector to select the turnstile control mode, the jumper is fixed — the pulse control mode, the jumper is not fixed — the potential control mode. The jumper is fixed at the factory before the delivery (see Clause 5.2.7).
- **J2** – connector for programming.
- **Power** – power LED indicator on the control board.

Table 2. Contacts of the connector blocks

№	Item	Function of the contact
		Connector blocks of the CLB.140
		XT1L (In)
1	+12V	Output of power supply for ID
2	Detector	Input for connections ID
3	GND	Common contact for connections ID
4	Fire Alarm	Input for emergency opening device
5	GND	
6	GND	Common
7	Unlock A	Inputs for turnstile control
8	Stop	
9	Unlock B	
10	Led A	Indication outputs of RC-panel
11	Led Stop	
12	Led B	
		XT1H (Out)
1	GND	Output of power supply for additional devices
2	+12V	
3	Alarm 1	Outputs for connections siren
4	Alarm 2	
5	Common	Common contact for *PASS A*, *PASS B signals*
6	Pass A	*PASS A* relay contact (passage in direction A)
7	Pass B	*PASS A* relay contact (passage in direction B)
9	Ready	Relay output *READY* (turnstile readiness)
10	Det Out	Relay output *DET OUT* (retransmission of intrusion detector condition)
		XT3 (+12VDC)
1	+12V	Connection of power cable (from ***XTU1***, cable №1)
2	GND	
		XT4 (Light A)
1	NO	*Light A* relay contacts – connection of remote indicator for direction A
2	C	
3	NC	
		XT5 (Light B)
5	NO	*Light B* relay contacts – connection of remote indicator for direction B
6	C	
7	NC	
		Out connector block XTU1
1	+12V	Connection of external power supply 12VDC
2	GND	
1	+12V	Splitter of external power supply 12VDC for additional devices
2	GND	
		Out connector block XTU2
3	Fire Alarm	Input for emergency opening device
4	GND	
5	GND	Common
6	Unlock A	Inputs for turnstile control
7	Stop	
8	Unlock B	
9	Led A	Indication outputs of RC-panel
10	Led Stop	
11	Led B	
12	Common	Common contact for *PASS A*, *PASS B signals*
13	Pass A	*PASS A* relay contact (passage in direction A)
14	Pass B	*PASS A* relay contact (passage in direction B)

№	Item	Function of the contact
		Out connector block XTU3
1	+12V	
2	R	
3	GND	Connection of indication cable from main cover (cable №4)
4	L	
5	+7V	
6	+7V	Connection of indication cable from right side module (cable №5.2)
7	+7V	Connection of indication cable from left side module (cable №5.1)
8	GND	Connection of indication cable from right side module (cable №5.2)
9	GND	Connection of indication cable from left side module (cable №5.1)

For convenience, connection contacts of turnstile power supply and turnstile control units are set on the bracket on connector blocks **XTU1** and **XTU2**. Connection is conducted out in accordance to the connection diagram of the turnstile and optional equipment (see Fig. 19, 20, 21). Electric power supply is carried out through the power cable (9).

5.2.6 Parameters of control signals

The turnstile is operated by input of a low-level signal to the contacts "*Unlock A*", "*Unlock B*" and "*Stop*" relatively to the "*GND*" contact. As the control element there can be used a normally open relay contact or a circuit with open collector output at that (Fig. 8 and 9).

Emergency unblocking of the turnstile is carried out by removing of a low-level relatively to the "*GND*" contact signal from the "*Fire Alarm*" contact. As a control element there can be used a normally closed relay contact or a circuit with open collector output at that. All turnstile control commands coming to other outputs are ignored (see Clause 5.3.2). During the low signal injection on "*Fire Alarm*" output directions switch to the mode according to signal levels on inputs "*Unlock A*", "*Unlock B*" and "*Stop*".

Activation of intrusion detector is controlled by removing of a low-level relatively to the "*GND*" contact signal from the "*Detector*" contact. As a control element there can be used a normally closed relay contact or a circuit with open collector output at that.

Note:

For generation of high-level signal at all input contacts ("*Unlock A*", "*Stop*", *Unlock B*", "*Fire Alarm*" and "*Detector*") 2kOhm resistors connected to the power supply bus *"+ 5 V"* are used.

The control element must provide the following signal characteristics:
  the relay contact as the control element:
    minimum switched current .... no more than 2 mA
    closed contact resistance
    (with the resistance of the connected cable) .... no more than 300 Ohm
  the circuit with open-collector output as the control element:
    voltage at the closed contact
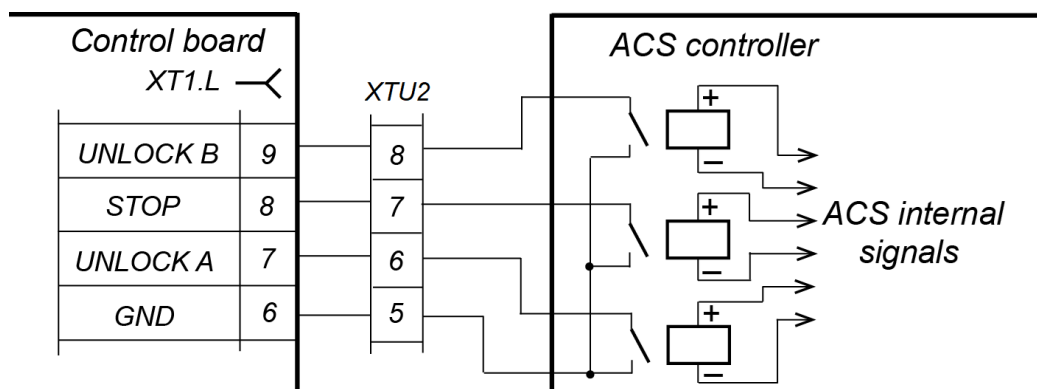   (low - level signal at the CLB input) .... no more than 0.8 V

Figure 8. ACS control element - normally open relay contact
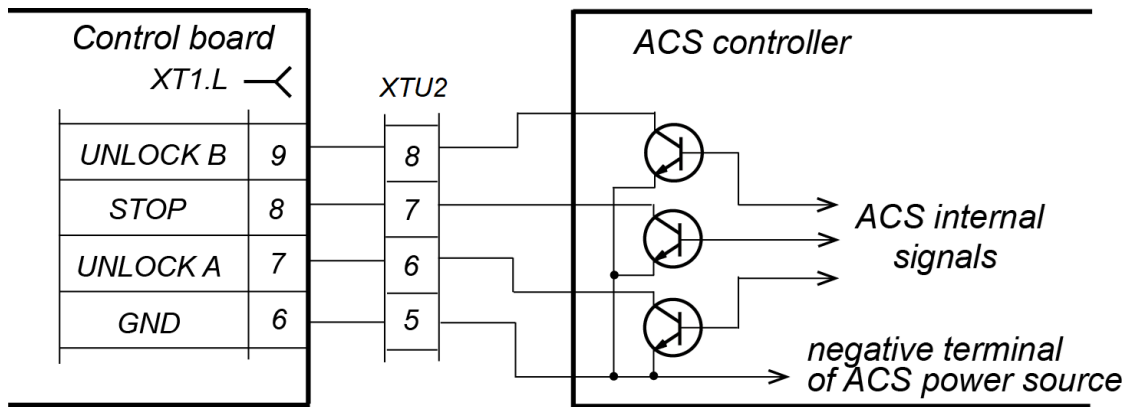
Figure 9. ACS control element - circuit with open-collector output

5.2.7 Control modes of the turnstile

There can be two control modes of the turnstile: pulse and potential. In both modes turnstile control is conducted by command issuing (namely by combination of control signals) on operational control inputs: "*Unlock A*", "*Stop*" and "*Unlock B*" and special control input "*Fire Alarm*". Depending on a chosen mode the procedure of command issuing changes (see Table 6 and 7).

The control mode is set by removal / installation of the jumper on a *J1* connector on control board. The *J1* connector location is shown in Fig. 7. An installed jumper corresponds to the pulse control mode. In order to switch to potential mode, uninstall the jumper. The change of control mode will take place after switching on the turnstile.

⚠️ *Warning!*

Installation and removal of the jumper is to be done only when the turnstile is switched off.

By removal of low-level signal from special control input "*Fire Alarm*", turnstile switches to "*Fire Alarm*", mode and therewith all incoming commands of turnstile control are ignored (see Clause 5.3.2).

Pulse control mode

The mode is used to control the turnstile with RC-panel, WRC and CLB, outputs of which support pulse control mode.

Duration of control signal during command issuing on operational control inputs should be not less than 100 mc. The passage waiting time is 5 seconds and it doesn't depend on duration of control signal (impulse).

Description of turnstile work in pulse control mode is described in Table 6. Procedure of command issuing is described in Appendix 2.

Potential control mode

The mode is used to control the turnstile with CLB, outputs of which support potential control mode.

Duration of control signal during command issuing on operational control inputs should be not less than 100mc.

The passage waiting time equals the duration of control signal: if by the moment of the passage in authorized direction at the entrance of this direction there is a low-level signal, then the turnstile will stay open in this direction.

At the low-level signal inputting to the "*Stop*" input, both directions will lock for the time of the signal duration regardless of the signal strength at the inputs "*Unlock A*" and "*Unlock B*". By the removal of a low-level signal from the "*Stop*" input, the directions will set to the modes according to the signal strength at the inputs "*Unlock A*" and "*Unlock B*".

Description of turnstile work in potential control mode is described in Table 7. Procedure of command issuing is described in Appendix 3.

> **Note:**
>
> To organize single passages in potential control mode it is advisable to remove low-level control signal from control input "*Unlock A*" / "*Unlock B*" during activation of relay output "*PASS A*" / "*PASS B*" of corresponding direction.

5.2.8 Algorithm of the control mechanism

Procedure of turnstile work in the pulse control mode in case of a single passage in one of directions:

1. From control unit (RC-panel, WRC, ACS) on control board inputs comes a command (combination of control commands) for execution of a single passage in one of directions.

2. Microcontroller, fixed on the control board, processes the received signal combination and forms a command to the turnstile control unit to unblock the rotary mechanism. Turnstiles hold time counting starts in the blocked mode.

3. Control mechanism unlocks the rotary mechanism for the rotation in a chosen direction. Passage in this direction becomes possible.

4. After the passage is complete, barrier arms rotation angle is monitored by microcontroller with optical sensors of control mechanism. With rotation angle of more than 67° the act of passage is registered. One of relay outputs "*PASS A*" or "*PASS B*", according to the direction of the passage, becomes active. Microcontroller forms the instruction to the control mechanism for blocking the turnstile rotation mechanism.

5. After the passage is complete, i.e. when barrier arms are reset to the closed position (120° rotation), turnstile rotation mechanism is blocked. Relay output "*PASS A*" / "*PASS B*" becomes normal.

6. If barrier arms rotation hasn't started, then the command for blocking rotation mechanism is formed as hold time passes in unblocked mode (5 seconds from receiving the instruction by default).

7. Turnstile is ready for next passage.

5.2.9 Control of the built-in card capture reader mechanism [1]

The algorithm of the card capture reader mechanism:

1. In the standby mode, the receiving slot of the card capture reader is permanently illuminated by the built-in LED indicator. The access card identificator, inserted into the receiving slot, is read by the integrated reader and sent for analysis to the external ACS controller.

2. If the presented card is a permanent employee card and does not require the withdrawal, the ACS controller allows the passage through the turnstile in the given direction (gives the appropriate signal to the turnstile control mechanism). The shutter, blocking access to the card collector, remains closed, preventing the accidental withdrawal of the card. The illumination of the card slot remains constant.

3. If the presented card is a temporary visitor card and requires the withdrawal, the ACS controller gives the control signal to the control board input of the card capture reader "*Capture card*" (contact "*INPUT*" **XT1**, see Fig.10). The illumination of the card slot will start flashing with a frequency of 2 times per second, indicating that the card is to be withdrawn.

4. If, after the arrival of this signal, the optical sensor in the card capture reader records the presence of the card in the receiving slot, the electromagnet of the card capture reader opens the shutter which blocks the access to the card collector and the card falls into the card collector – the card is withdrawn. If there is no card in the receiving slot, the electromagnet will not work and the access to the card collector will remain blocked.

5. When the card falls into the card collector, the second optical sensor records the withdrawal of the card. In this case, the card reader closes the shutter, the illumination of the card slot again becomes permanent. Simultaneously from the output of the control board "*Card captured* "

---

[1] For **TTD-10AC** turnstile version with card capture reader.

(contact "*OUT*" ***XT2***, Fig.10) a control signal is sent, which is a confirmation of the passage for the ACS controller. After this signal, the ACS controller allows the passage in the given direction (gives the corresponding signal to the turnstile control mechanism) and after the passage through the turnstile removes the signal "*Capture card* ". By removing the "*Capture card*" signal, the card reader removes the "*Card captured* " signal.

6. The third optical sensor of the card capture reader tracks the fact of filling of the card collector. When it is full, the card capture reader sends an "*Fault*" signal (contact "*Alarm*" ***XT2***, Fig.10), to the ACS controller, the illumination of the receiving slot of the card capture reader goes into the flashing mode with a frequency of 1 time in 2 seconds, thereby warning about the need to free the collector from the withdrawn cards. If the collector is not emptied, then after receiving 10 more cards, the work of the card capture reader is blocked, the illumination of the receiving slot is extinguished. The unlocking of the card capture reader is automatically after the card collector is emptied (the algorithm of removal and installation of the card collector is given in Clause 9.5). Also, the "*Fault* " signal is sent to the ACS controller in case of malfunction of the card capture reader mechanism (the illumination of the receiving slot is extinguished).

Parameters of control signals:

The "*Capture card"* input is controlled by an output of a dry contact type or open collector of the ACS controller. The input is a normally open, i.e. when a control signal is sent the ACS controller closes the input to the "*GND"* contact (contact 4).

The input parameters:
Voltage at the opened contact relatively to the "*GND"* .... 5±0.5 V
Voltage at the closed contact relatively to the "*GND"* .... max. 0.8 V
Current through the closed contact .... not exceeding 1.5 mA

The outputs "*Card captured"* and "*Fault"* – dry contact. Each of these inputs is one of 2 relay contacts. Other relay contacts are banded and connected to a "*COM"* output (contact 7). The outputs are normally open, i.e. when a signal is sent the corresponding output closes with the "*COM"* contact.

The output parameters:
Maximum voltage between a corresponding output and the "*COM"* contact .... 42 V
Maximum switched current .... 200 mA
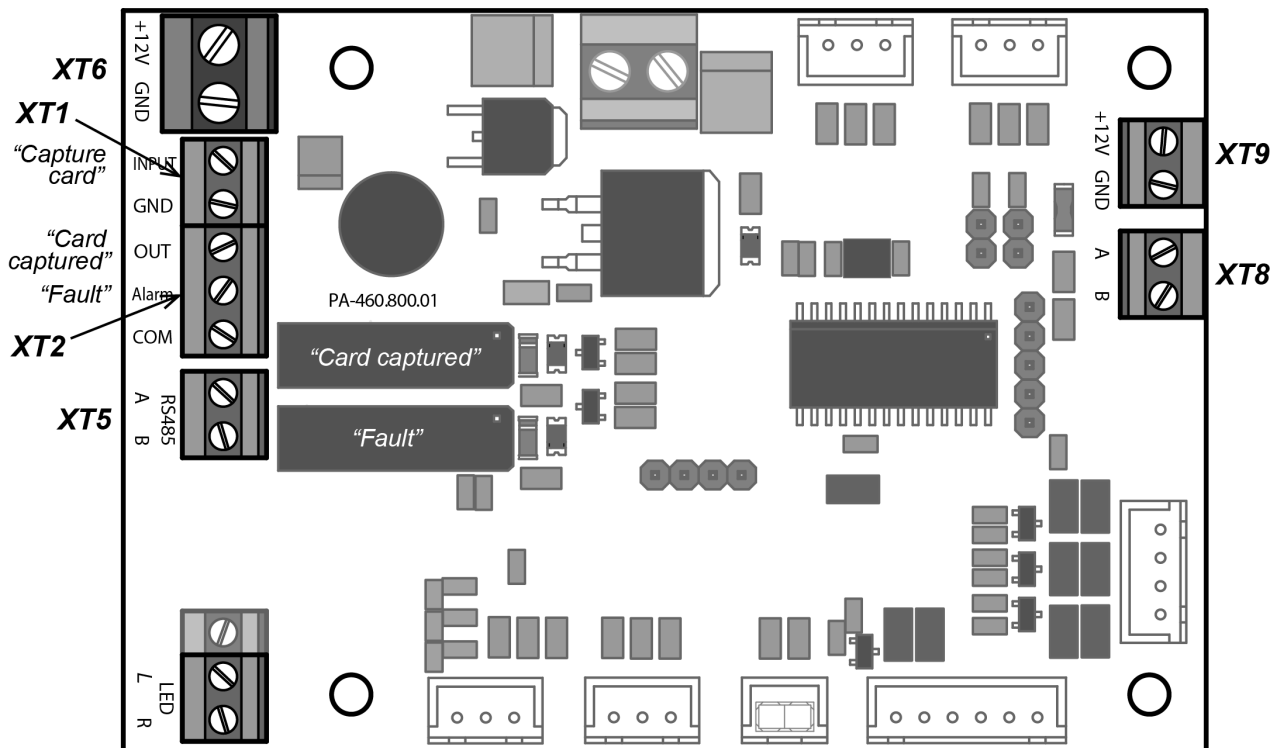

Figure 10. PA-450 control board of the card capture reader

The control board overall view is shown is shown in Fig. 10. On the board there are terminal blocks:

- **XT1** - "*Capture card*" input of the card capture reader ("*INPUT*" and "*GND*" contacts).
- **XT2** - "*Card captured*" ("*OUT*" and "*COM*" contacts) and " *Fault* " ("*Alarm*" and "*COM*" contacts) outputs of the card capture reader.
- **XT5** - connector for connecting *RS-485* interface lines from an ACS-controller ("*A*" and "*B*" contacts, only for **PERCo** controllers).
- **XT6** - connector for power supply of the card capture reader ("*+12V*" and "*GND*" contacts).
- **XT8** - connector for connecting a built-in card reader (made by **PERCo**) to the RS-485 interface lines ("*A*" and "*B*" contacts).
- **XT9** - connector for power supply of the built-in card reader (contacts "*+12V*" and "*GND*").

5.2.10 Control of the built-in card coin acceptor mechanism [1]

A coin acceptor **ICT UCA2**, a pulse counter **Yenox H2-7EA2** and a container with a filling sensor assembly (coin acceptor) are integrated in the side module with a built-in coin acceptor. For the coordination of signals with the majority of ACS in the internal connections scheme, pull-up and limiting resistors are used.

The coin acceptor is a complex technical device, the use of the coin acceptor and the impulse counter is allowed only in accordance with the documentation of the manufacturer.

Upon delivery, the coin acceptor is programmed to accept standard euro coins[2]. Using a cable (RS-232 interface) and the manufacturer's software, the coin acceptor can be programmed to receive a certain amount of money with coins of different denominations and to output one or more pulses to the turnstile CLB.140 control board, see Appendix 4. The duration and pulse level are set by switches on the coin acceptor. To allow access, for the turnstile control board it is sufficient to receive a single low-level pulse with a duration of at least 0.25 seconds at the corresponding input.

The power supply of the side module devices with the coin acceptor is provided from the turnstile power supply in parallel with the main housing of the turnstile with a voltage of 12VDC. The internal connections of the side module with the coin acceptor are shown in Fig. 23.

The coin acceptor is connected to the ACS in compliance with the requirements of the coin acceptor manufacturer documentation and ACS controller.

It is possible to use the coin acceptor without using the ACS and additional devices. Fig. 22 shows the connection scheme of the side module devices and the main housing. Parallel connection of the remote control, radio control and coin acceptor to the control inputs of the main housing is allowed.

The coin acceptor has a blocking coin acceptance input ("*INHIBIT*"). Acceptance of coins is blocked by a low-level signal at this input.

The pulse counter counts the low-level pulses arriving at its input (channel A), i.e. number of passages. The pulse counter has a reset button.

When the coin acceptor is full, a high-level signal is generated at the output of its filling sensor assembly, which is used to inform about the necessity to empty the coin acceptor.

The algorithm of the coin acceptor mechanism in case of the complex use without ACS (Fig. 22):

1. When the specified amount is received, the coin acceptor issues a passage enable command - a low level signal - to the "*Unlock A*" input of the turnstile control board. In this case the turnstile is unlocked in this direction and gives to the coin acceptor the command from the output "*Light A*" to block the acceptance of coins for the duration of the passage.
2. After the passage, the blocking signal is taken off and from the "*PASS A*" output a low-level signal to the pulse counter is sent.

---

[1] For **TTD-10APE** turnstile version with coin acceptor.

[2] To accept coins (tokens), different from the standard euro coins, it is necessary to reprogram the coin acceptor with the help of a special programming tool.

3. When the coin acceptor is full, the filling sensor assembly issues a high-level signal to the "*Detector*" input of the turnstile control board, upon receipt of which the turnstile sends a low-level signal to the "*Alarm*" output (the command of the blocking of coin acceptance). When the coin acceptor is emptied, the high-level signal from the "*Detector*" input is taken off, accepting of coins is resumed.

5.3   Control devices of the turnstile

The turnstile can be operated from the following control devices: RC-panel, WRC, ACS-controller.

The above devices can be connected to the turnstile as follows: any device separately, in any combination with each other, all devices simultaneously (in parallel).

> ### *Note:*
> At the parallel connection of the above devices to the turnstile the superposition of the control signals from them may occur. In that case the turnstile response will conform to response to the obtained combination of input signals. (App. 2 and 3).

5.3.1 Connection of the RC-panel

The RC-panel is connected to the contacts "*GND*", "*Unlock A*", "*Stop*", "*Unlock B*", "*Led A*", "*Led Stop*" and "*Led B*" of the **XTU2** in accordance with Table 3 and Fig. 20, 21, 22.

Standard orientation of RC-panel in regard to the housing is shown in Fig 11.

If working space of the operator is located on the opposite side of the housing, then for convenience of operation it is necessary to swap RC-panel cables, connected to contacts "*Unlock A*" and "*Unlock B*", as well as "*Led A*" and "*Led B*" correspondingly (see Table 3).
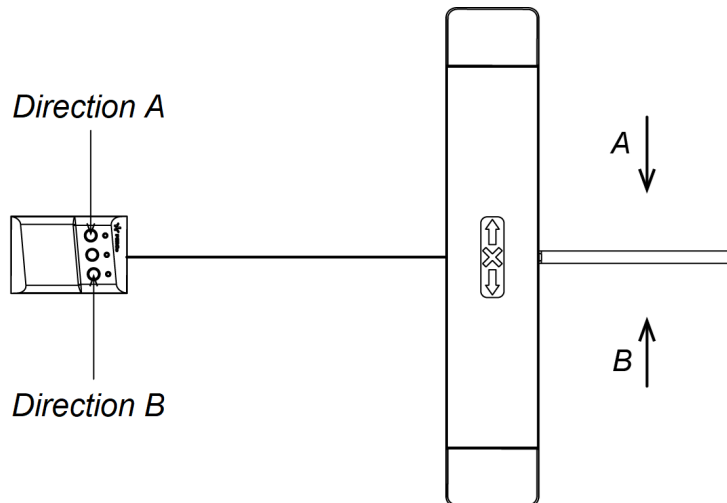

Figure 11. Standard RC-panel orientation regarding turnstile

**Table 3. RC-cable connection to the *XTU2* connector block
contacts for standard and reverse RC-panel orientation**

№	Contact	RC-panel orientation	
		Standard	**Reverse**
5	*GND*	black	black
6	*Unlock A*	white	green
7	*Stop*	blue	blue
8	*Unlock B*	green	white
9	*Led A*	yellow	red
10	*Led Stop*	orange	orange
11	*Led B*	red	yellow

> ### *Note:*
> The WRC is connected to the contacts "*GND*", "*Unlock A*", "*Stop*" and "*Unlock B*" of the **XTU2** connector block. Power supply of the WRC is connected to the contact "*+12V*" of the **XTU2** connector block.

5.3.2 Emergency opening device Fire Alarm

The emergency opening device is connected to the contacts "*Fire Alarm*" and "*GND*" of the **XTU2** connector block in accordance with the connection layout (see Fig. 19). If the "*Fire Alarm*" input is not used, it is necessary to set a jumper between the contacts "*Fire Alarm*" and "*GND*". This jumper is preset at the factory.

During release of control signal on "*Fire Alarm*" input, turnstile switches to the emergency "*Fire Alarm*" passageway opening. In this mode all incoming turnstile control signals are disregarded. Turnstile rotation mechanism is blocked for rotation in both directions. Central barrier arm falls down automatically by gravity and takes a vertical position which opens the passageway. The following indication in both directions is displayed simultaneously on main cover indication block: alternate switching on of green (for 1.25 sec) and red (for 0.25 sec) turnstile indicators.

If signal "*Fire Alarm*" comes on the turnstile during the passage, then on indication blocks appears an indication of "*Fire Alarm*" mode, but rotation mechanism blocking and passage emergency opening will take place only after resetting of barrier arm to its home position.

After release of control signal "*Fire Alarm*" on main cover indication block appears red indicator of passage denial and turnstile switches to the sleep mode with a dropped barrier. To proceed with the work, a barrier arm has to be manually set in horizontal position, where it fixes.

5.3.3 Control of the turnstile in ACS

Turnstile can be used as optional equipment while working as a part of ACS. In the turnstile it is possible to install built-in proximity card readers inside the side modules when using special side covers (see Table 1).

The ACS-controller outputs are connected to the contacts "*GND*", "*Unlock A*", "*Stop*" and "*Unlock B*" of the **XTU2** connector block. The ACS-controller inputs are connected to the contacts "*Common*", "*PASS A*", "*PASS B*" of the **XTU2** connector block and to the contacts "*Ready*" and "*Det Out*" of the **XT1.H** connector block. Pin assignments of the connector blocks are given in Fig. 20, 21).

5.4 Additional devices connectable to the turnstile

5.4.1 Relay outputs

Connection of control board to relay outputs is done through corresponding contacts of connector block **XT1.H**. The following relay outputs are installed:
- *ALARM:* contacts "*Alarm 1*" and "*Alarm 2*" (see Clause 5.4.2),
- *PASS A:* contacts "*Pass A*" and "*Common*" (see Clause 5.2.8),
- *PASS B:* contacts "*Pass B*" and "*Common*" (see Clause 5.2.8),
- *READY:* contacts "*Ready*" and "*Common*" (see Clause 5.5),
- *DETECTOR:* contacts "*Det Out*" and "*Common'* (see Clause 5.4.2).

Contacts "*Pass A*", "*Pass B*" and "*Common*" are also located on **XTU2** connector block.

Relays have normally open contacts. Therewith common for those relays contact "*Common*" is not connected with the negative of turnstile power supply (galvanically isolated). In initial (standard) condition with a switched on power supply relay contacts "*PASS A*", "*PASS B*", "*READY*" and "*DETECTOR*" are closed (relay coil gets energized), and relay contacts "*ALARM*" are opened (relay coil gets deenergized).

Relay winding energizing can be identified by lighting up of corresponding red LED, installed on control board near the corresponding relay (see Fig. 7).

The output cascades for "*PASS A*", "*PASS B*", "*Ready*", "*Det Out*" and "*Alarm*" are the contacts with the following signal characteristics (Fig. 12):

maximum commutation voltage ....42 VDC
maximum switched current ....0.25 A
closed contact resistance...no more than 0.15 Ohm
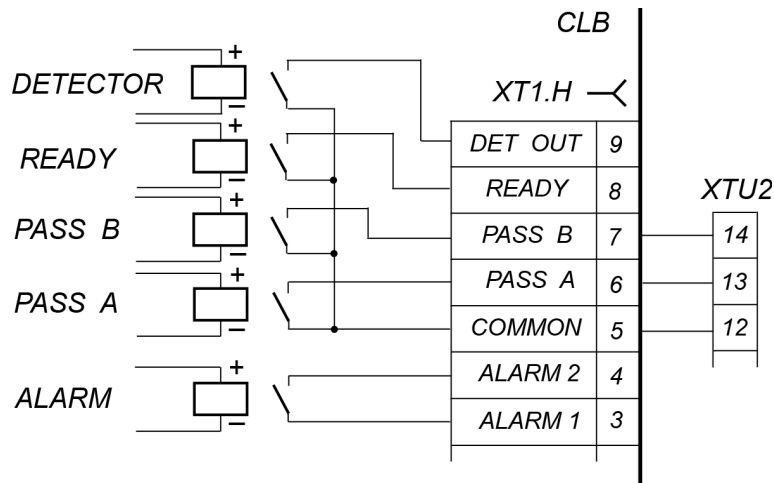
Figure 12. Output cascades for "PASS A", "PASS B", "Ready", "Det Out" and "Alarm"

5.4.2 Intrusion detector and siren

⚠️ *Warning!*

Installation of intrusion detector inside the turnstile housing is not anticipated.

Intrusion detector is connected to contacts "*Detector*", "*GND*" and "*+12V*" of connector block **XT1.L** of control board. Characteristics of input signals are indicated in Clause 5.2.6. Current condition of intrusion detector is transmitted on relay output "*DETECTOR*" (contacts "*Det Out*" and "*Common*" of connector block **XT1.H**).

Siren is connected to contacts "*Alarm 1*", "*Alarm 2*" and "*GND*" and "*+12V*" of connector block **XT1.H**. Characteristics of relay output signals "*ALARM*" are indicated in Clause 5.4.1.

Output activation "*ALARM*" takes place, if activation of input "*Detector*" takes place with a blocked rotating mechanism of the turnstile (command *"Passage denial"* or *"Both directions closed"* is issued), i.e. control signal comes from the intrusion detector. Output "*ALARM*" gets stabilized in 5 seconds after activation or in case of any incoming control command.

ℹ️ *Note:*

Control signal from intrusion detector doesn't lead to "*ALARM*" output activation, if the rotating mechanism of the turnstile is blocked in one of directions or was blocked less than 3 seconds ago.

5.4.3 Remote indicators

Remote indication blocks for corresponding passage directions is connected to outputs "*Light A*" and "*Light B*". Outputs are provided with the complete group of contacts: normally opened "*NO*", normally closed "*NC*" and common "*C*". Connection to the outputs is done correspondingly through connector blocks **XT4** and **XT5**.
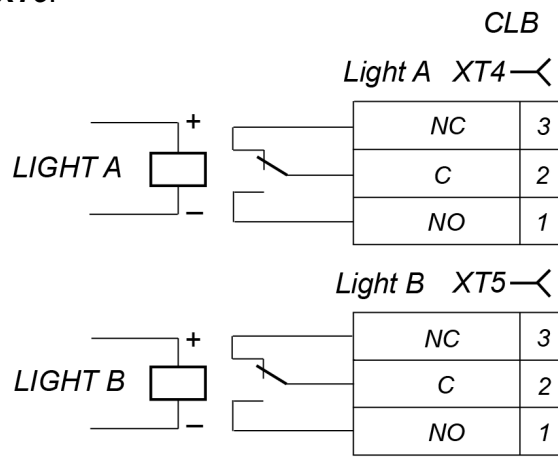

Figure 13. Output cascades for "Light A" and "Light B"

If the passage in direction A/B is permitted, relay of corresponding passage direction "*Light A*" / "*Light B*" gets activated (its winding gets energized), if the passage is denied – it gets stabilized. Relay winding energizing can be identified by lighting up of corresponding red LED, installed on control board near the corresponding relay.

Output cascades for the "*Light A*" and the "*Light B*" relays are nonbridging relay contacts (Fig. 13) with the following signal characteristics:

maximum switched voltage .... 30 VDC
maximum switched voltage .... 42 VAC
maximum switched AC/DC .... 3 A
closed contact resistance .... no more than 0.15 Ohm

5.5 Operation contingencies and response

Turnstile anticipates an alarm function of standard mode violation in case of unauthorized passage and in case of late barrier arms resetting to the home (closed) position. Barrier arms turn is controlled by activation of rotation unit light sensor. Sensor gets activated with barrier arms turn angle wider than 8 degrees from the home (closed) position.

- Unauthorized access is a rotation of barrier arms without a command to unblock the rotation unit.
- Barrier arms return to initial position is considered to be delayed if the passage zone is opened for more than 30 seconds.

In each of indicated cases the activation of switch *"READY"* takes place (switch coil is deenergized), therewith the output contacts "*Ready*" and "*Common*" get opened (ref. Clause 5.4.1). When barrier arms reset to home position, normalization of switch "*READY*" takes place (switch coil is energized), the output contacts "*Ready*" and "*Common*" get closed*.*

Note:

If the optical sensor of barrier arms rotation unit breaks down, the activation of switch *"READY"* takes place as well until the fault is repaired.

6   MARKING AND PACKAGING

The turnstile has a marking sticker on the internal side of the turnstile main cover and a label – inside, on the rear side of the main turnstile housing. The label contains trademark, contact information of the manufacturer, production date, power-supply voltage, power consumption. To get access to the marking sticker and the label, open the main cover.

The sticker is located on the inner surface of the main cover (2). The sticker contains a scheme of internal connections (main housing) of the turnstile, similar to that shown in Fig. 19.

To do so proceed as follows:

1. Switch off power supply of the turnstile.
2. Insert the key into the main cover lock (4) and open the lock.
3. Holding the front edge of the main cover (2) carefully lift it and turning it remove it from the turnstile housing. Be careful – do not damage the indication cable! When removing the cover, it must be disconnected from the main cover indication block (3).
4. Place the main cover on a flat steady surface.

Installation of the main cover back into its operation position is carried out in reverse order. After mounting the main cover close the lock. Turn on the turnstile power supply and move the upper barrier arm into the working position.

The turnstile in the standard delivery set is packed in two transport boxes and two packages (totally - 4 places), protecting the components of the product from damage during transportation and storage.

Box №1 overall dimensions (length × height × width) ....146×110×40 cm
Box №1 weight (gross) ....not more than 100 kg
Box №2 overall dimensions (length × height × width) ....114×30×40 cm
Box №2 weight (gross) ....not more than 35 kg

7   SAFETY REQUIREMENTS

7.1   Installation safety requirements

The installation should be carried out only by the qualified personnel after careful study of this *Manual*.

⚠️ ***Warning!***
- All the cables should be connected up when the power supply is switched off from the AC mains.
- Only serviceable tools should be used for installation.
- Observe general electrical safety rules when laying out the cables.
- Before the turnstile first power on make sure its installation and connection have been made accordingly.

Power supply unit installation must be made in accordance with the safety rules stipulated in its certificate.

7.2   Operation safety requirements

Observe general electrical safety rules when operating the turnstile.

❌ ***Warning!***
- Do not use the turnstile under conditions that do not comply with the requirements of Chapter 2 of this Manual.
- Do not use the turnstile at supply voltage that does not comply with the requirements of Chapter 3 of this Manual.

Safety requirements on the power supply unit operation are shown in their certificates.

8   INSTALLATION INSTRUCTIONS

Follow the safety requirements during the installation (see Clause 7.1).

8.1   Installation details

Proper installation is critical to performance and serviceability of the turnstile. We strongly advise to study this section before installation work, and follow the instructions to the latter.

It is recommended:
- to mount the turnstile on steady and level concrete (grade 400 or higher, strength class B22,5), stone or similar foundations at least 150 mm thick;
- to level the foundation so that the anchoring points of the turnstile lie in the same plane (check it with a level);
- to apply reinforcing elements (400×400×200 mm) for installation on less steady foundation;
- to mark the mounting holes according to Fig. 16;
- to control vertical alignment of the turnstile with a level during installation;
- to do installation of the turnstile by at least 2 skilled installers;
- when arranging a passage area through the turnstile please take into account that the resetting mechanism operates as follows:
  – at the barrier arm turning at the angle of more than 67° the reset is effected in the direction of movement;
  – at the barrier arm turning at the angle less than 67° the reset is effected counter the movement direction (reset to home position).

ℹ️ ***Note:***
The angle gradient, at which the barrier arm reset commences, may vary in the range of ± 5˚. To ensure accurate passage tracking, when the turnstile is operated from an ACS, it is recommended to arrange the passage area in such a way that the barrier arms should turn in the direction of movement at the angle no less than 70° (Fig. 14).

By organization of the passage zone it is essential to anticipate an extra emergency exit. For example, "anti-panic" hinged section of ***BH-02*** railing (ref. Clause 9.4) can serve as such an exit.
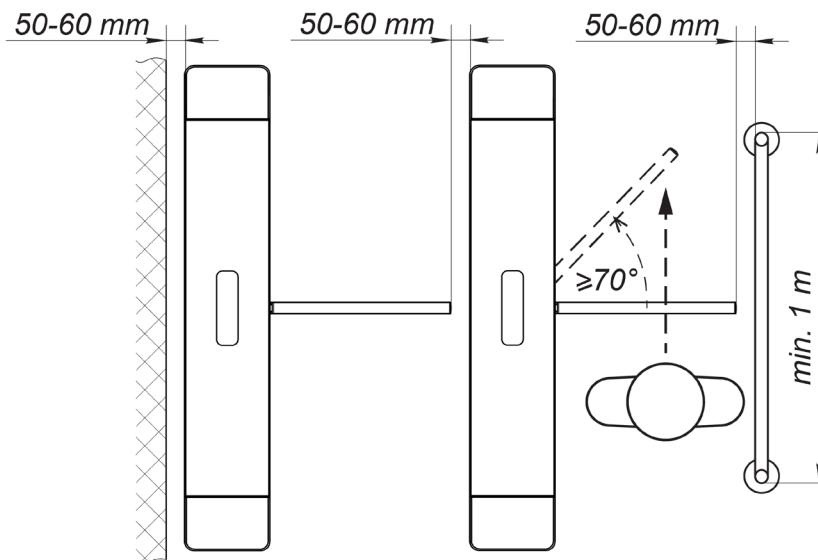
Figure 14. Installation recommendations

8.2 Installation tools

- 1.2÷1.5 kW hammer drill;
- Ø16 mm hard-alloyed drill bits;
- Floor chaser for electric raceway;
- Flat slot screwdriver No.2;
- Flat slot screwdriver №5 (150 mm);
- Cross-head screwdriver №2;
- Horn-type and socket wrenches: S17, S13, S10, S8, S7, S5.5;
- Level;
- Measuring tape (2 m);
- Slide caliper.

Note:

It is allowed to use other testing equipment and measuring tools provided the equipment in use ensures the required parameters and measurement accuracy.

8.3 Length of cables

Cables, used for installation, are listed in table 4.

Table 4. Cables used during the installation

№	Equipment connected to the turnstile controller	Maximum cable length, m	Cable type (number of wires)	Minimum cross-section, mm	Example of the cable
1	Power supply	10	Twin wire	1.5	AWG 18; HO3VV-F 2×1.5 bi-colored
		15	Twin wire	2.5	AWG 13; HO5VV-F 2×2.5 bi-colored
2	- *Fire Alarm* - Additional equipment, connected to inputs or outputs of CLB	30	Twin wire	0.2	RAMCRO SS22AF-T 2×0.22 CQR-2
3	RC-panel	40	8 triad cable	0.2	CQR CABS8 8×0.22c
4	Controller ACS	30	6 triad cable	0.2	CQR CABS6 6×0.22c

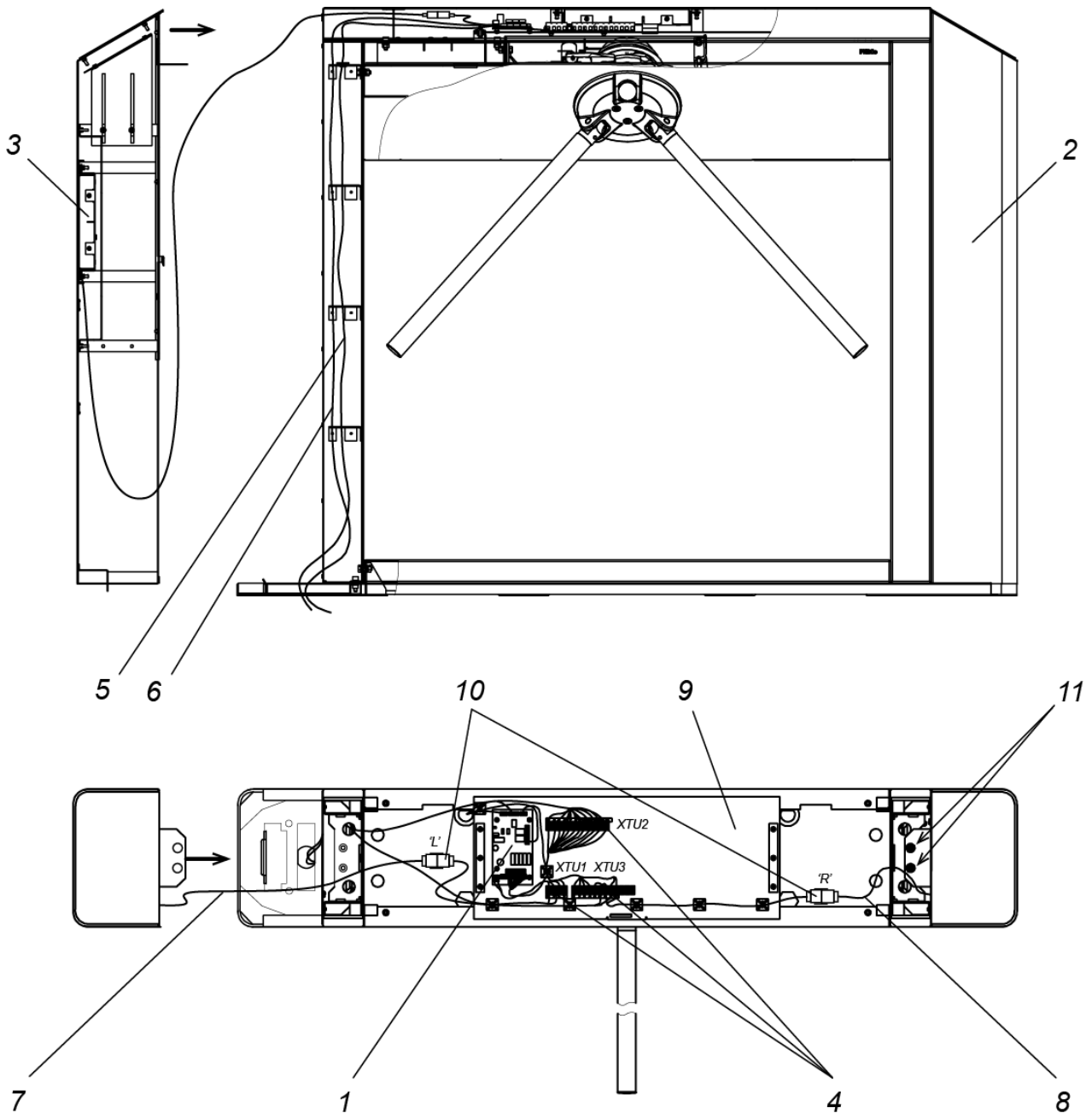| №	Equipment connected to the turnstile controller	Maximum cable length, m	Cable type (number of wires)	Minimum cross-section, mm	Example of the cable
5	Power supply of the built-in card reader for **TTD-10AC**	2.5	Twin wire	0.75	AWG 18; HO3VV-F 2×1.5 bi-colored
6	Power supply of the built-in coin acceptor for **TTD-10APE**	2.5	Twin wire	0.35	AWG 22; HO3VV-F 2×0.35 bi-colored

Figure 15. Cable layout inside the housing

1 – CLB; 2 – side module; 3 – side indication block;
4 – remote connector blocks **XTU**; 5 – power cable; 6 – cable from the RC-panel (WRC);
7, 8 – side module indication cables; 9 – ACS installation zone;
10 – indication cables connectors; 11 – screws M5×12 fixing the side module

8.4 Installation procedure

⚠️ *Attention!*

The manufacturer shall not be liable for any damage caused as the result of improper installation and declines any claims arising thereof in case if the installation is done not in compliance with the instructions provided in this Manual.

Content of installation procedures is presented per feedback in Clause 8.1. Equipment's and tools, required for installation, are listed in Clause 8.2. Cable types, used during installation, are listed in Clause 8.3. Connection layouts of the turnstile and optional equipment are presented in Clause 8.5. Item numbers are listed in accordance to Fig. 2.

During turnstile installation keep to the following procedure:

1. Install the turnstile power supply unit in its place (See power supply unit certificate for installation procedure of the power supply unit).

2. Drill the holes for anchor bolt sleeves to fix the turnstile housing (Ref. Fig. 16).
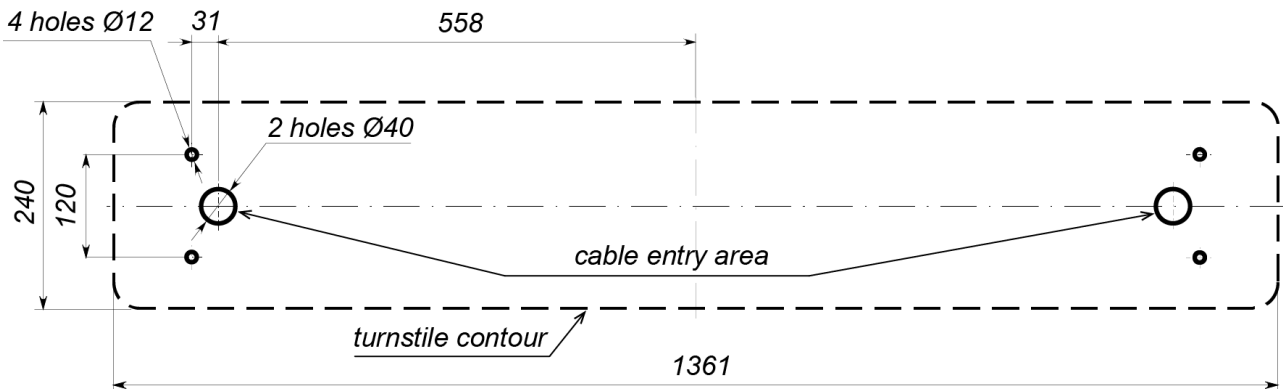
Figure 16. TTD-10A turnstile housing installation layout

3. If you lay the cables under the floor surface, prepare the electric raceway to the cables laying zone of the turnstile housing. The cables layout inside the turnstile housing is shown in Fig. 15.

⚠️ *Caution!*

- It is necessary to leave a reserve of length, enough for hinged joint removal and for the access to the barrier arms rotation unit, of those cables that are connected to the remote connector block and control board.
- Fix the housing after laying the cables in the electric raceway and inside the turnstile housing. Be careful and prevent the turnstile from falling before it is fixed.

4. Insert the sleeves for the anchor bolts into the holes so that they do not stick out above the floor surface.

5. Unpack main housing of the turnstile (box №1). Remove the turnstile housing main cover (2), ref. Section 6.

6. Set up the housing on anchor bolt sleeves and fix it with the M10 bolts through the holes in the housing base.

7. Connect the power cable (9) to a connector block *XTU1* according to connection layout.

8. If necessary, install the board of the external ACS controller inside the turnstile housing on the bracket (9, Fig. 15) and connect it to the CLB board (ref. Clause 8.5).

9. Connect the cable of the RC-panel (10) or WRC to a connector block *XTU2* (ref. Clause 8.5) or to external ACS-controller (ref. controller Operation Manual).

10. If needed, connect cables from other devices to corresponding connector blocks of control board (ref. Clause 8.5).

11. Use jumper *J1* to select the desired turnstile control mode (pulse or potential, ref. Clause 5.2.7).

12. Unpack the side modules (6, 13 or 17) (box No.2) and the side covers (8) (packed separately).

Assembly & Operation Manual

> ⚠️ ***Attention!***
>
> If the turnstile is installed outside, installation place of side module covers should be sealed. You may use rubber gaskets for sealing (included into delivery set of each standard side module). Stick it to the upper top edge of the module tightly to the window edge throughout the side module cover. In installation holes for covers gasket should be placed between the window edge and the hole, not covering it. Please, pay attention so that with the next installation of the cover, gasket didn't get out of it and made the cover fit tight to the side module housing.

13. Decide which of the side modules (standard (6), with card capture reader (13) or coin acceptor (17)) will be left, and which is right for the turnstile housing. Note that the arrows on the side indication blocks (7) are pointed towards the passage through the turnstile. If necessary, switch the indication blocks.

    To remove the side indication block (7):
    - for standard side module (Fig. 17):
        − remove the plate (4, Fig. 17), in order to do that turn off 6 screws (7, Fig. 17),
        − remove the bracket (3, Fig. 17) by unscrewing 4 nuts with washers (6, Fig. 17),
        − disconnect the connector of the indication cable from the indication block board,
        − remove the indication block (2, Fig.17) by unscrewing 4 nuts with washers (5, Fig.17).
    - for side module with card capture reader (coin acceptor) (Fig. 18):
        − open the collector cover lock with the key (3, Fig. 18) and pull it with the key towards you until it stops,
        − disconnect the connector of the indication cable from the indication block board,
        − remove the indication block (2, Fig.18) by unscrewing 4 nuts with washers (4, Fig.18).

    Installation of indication blocks is carried out in the reverse order. Before installation, place the jumper ***CROSS*** / ***ARROW*** as needed on both indication blocks (see Clause 5.2.3).

14. Fix the side covers on the side modules[1]. If necessary, install the necessary equipment in the side modules under the side covers or on them. Features of the installation of side covers are described in Appendix 1.

> ⚠️ ***Attention!***
>
> Possibility of ***PERCo*** card reader's installation is anticipated in the turnstile housing inside side modules on special brackets. With installation of third manufacturers readers they should correspond with following technical characteristics:
>
> overall readers dimensions .... not more than 175×120×50 mm
> sensors read range .... not less than 50 mm
>
> When installing another additional equipment, the side covers are purchased separately for specific equipment (see Clause 4.2 and Appendix 1).

> ℹ️ ***Note:***
>
> Installation of the access card reader in the side module with the built-in card capture reader of the ***TTD-10AC*** version is performed in the following order:
> - Remove the reader bracket (5, Fig. 18) by unscrewing the 2 screws.
> - Installed the reader on the bracket area using double-sided scotch or screws and nuts, drill holes if necessary.
> - Set in place the bracket. After the installation of the entire turnstile is completed, check the correctness of reading the access cards during their captured, if necessary, adjust the distance from the reader to the card receiving slot inside the side module, loosening the screws beforehand. After adjustment, finally tighten the screws.

---

[1] For the ***TTD-10AC*** version, only one side cover is supplied separately. In the side module with a built-in card capture reader, the side cover with a slot for receiving cards is already installed on manufactured. There is no other type of side cover for this side module.

15. Reinstall the side modules, each in the following order:
   - tilting the top of the side module toward you, insert its bottom into the appropriate place in the turnstile housing;
   - holding the side module, carefully lay the indicating cable from the side module to the control board bracket in the main housing in order not to damage it when installing the side module;
   - put the top of the side module back, herewith the holes in its upper mounting plate must be aligned with the corresponding threaded bushings in the turnstile housing;
   - fix the side module using two screws M5×12 with washers (11 in Fig. 15);
   - connect the indication cable connector from the side module to the corresponding (right "R" or left "L") indication cable connector of the main housing (10 in Fig.15).

16. Check serviceability and accuracy of all the electrical connections. Fix all cables with the help of self-adhesive foundations and fixed brace rods from the delivery set.

17. Put back a main cover (2) in an order, opposite to removal, see Section 6.

18. Check the work of the turnstile with RC-panel, according to Section 8.5 depending on a switched control mode.

The turnstile is ready for operation.
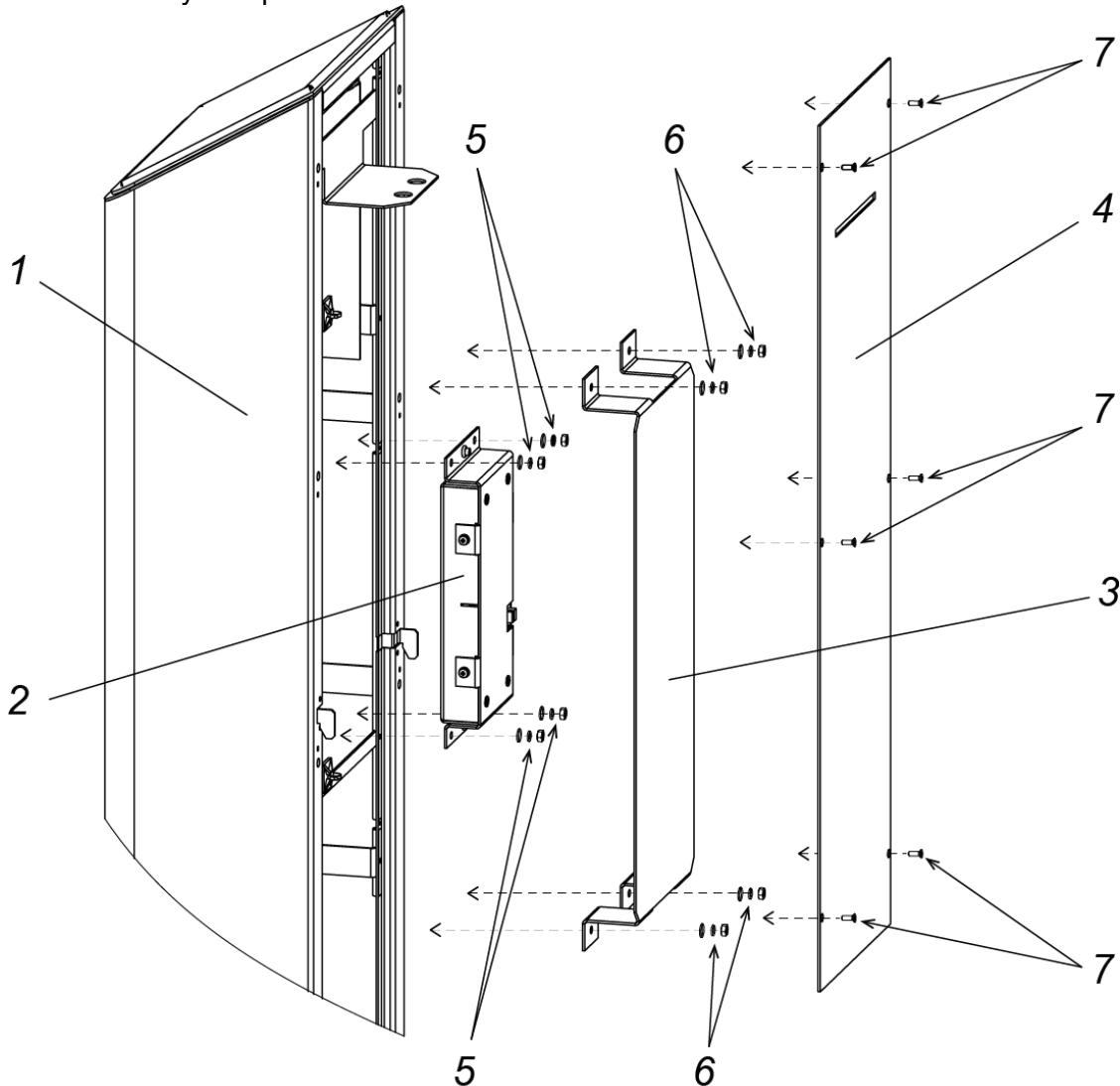
Figure 17. Side indication block (standard side module)

1 – standard side module; 2 – side indication block; 3 – bracket; 4 – plate;
5 – nuts with washers for fixing the indication block;
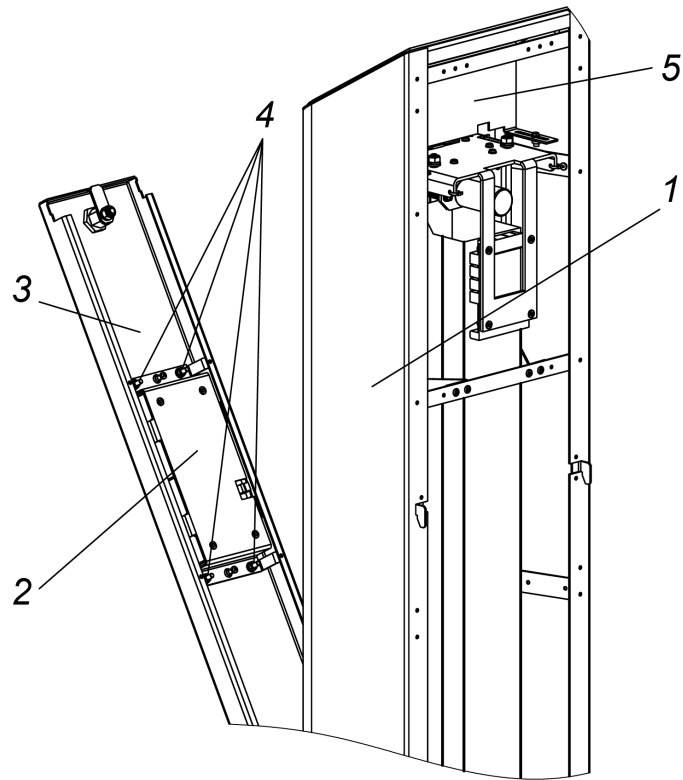6 – nuts with washers for fixing the bracket, 7 – screws for fixing the plate

Figure 18. Side indication block (side module with built-in card capture reader)

1 – side module with built-in card capture reader, 2 – container cover; 3 – side indication block;
4 – nuts with washers for fixing the indication block, 5 – bracket for card reader

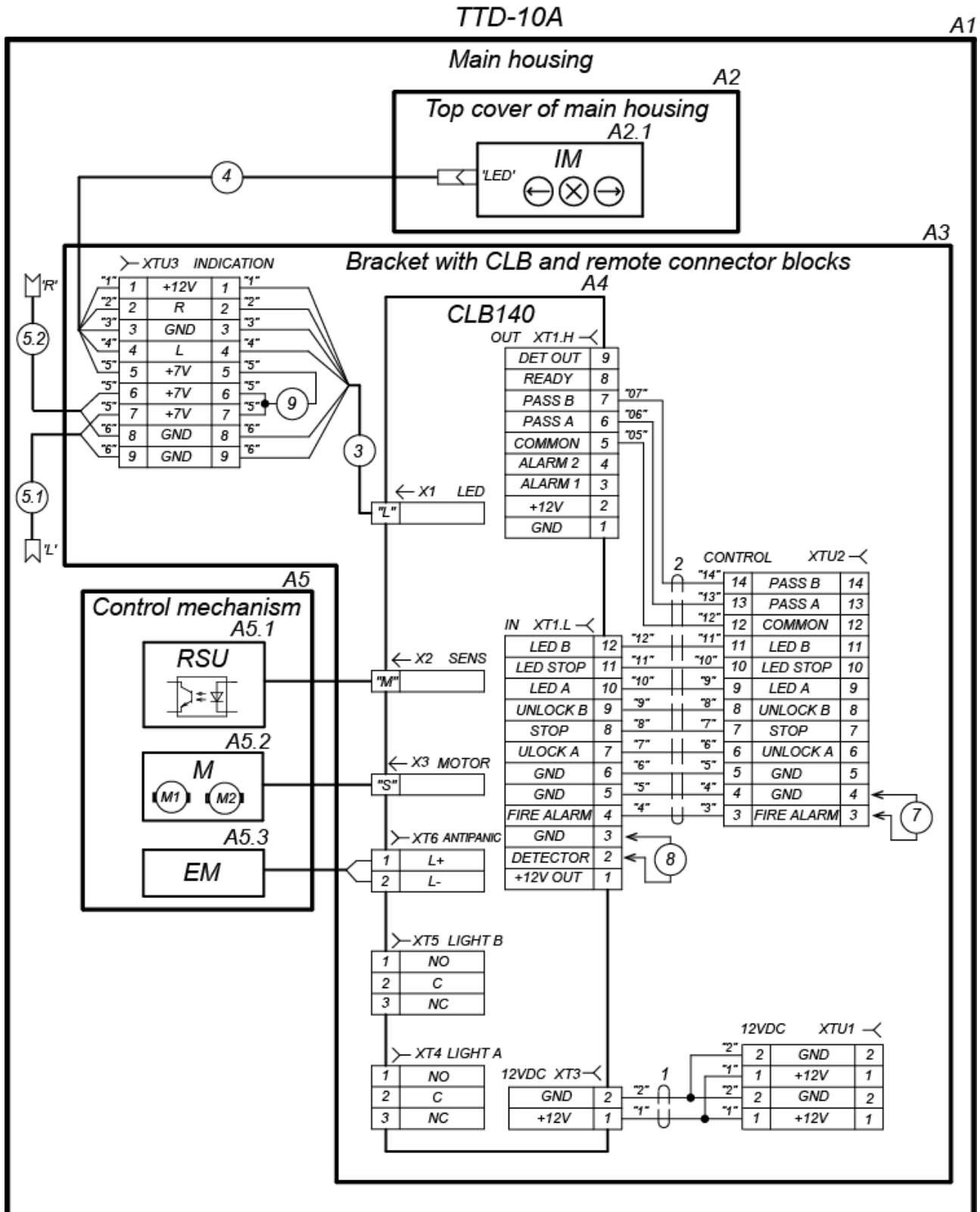## 8.5 Connection layouts of the turnstile and optional equipment
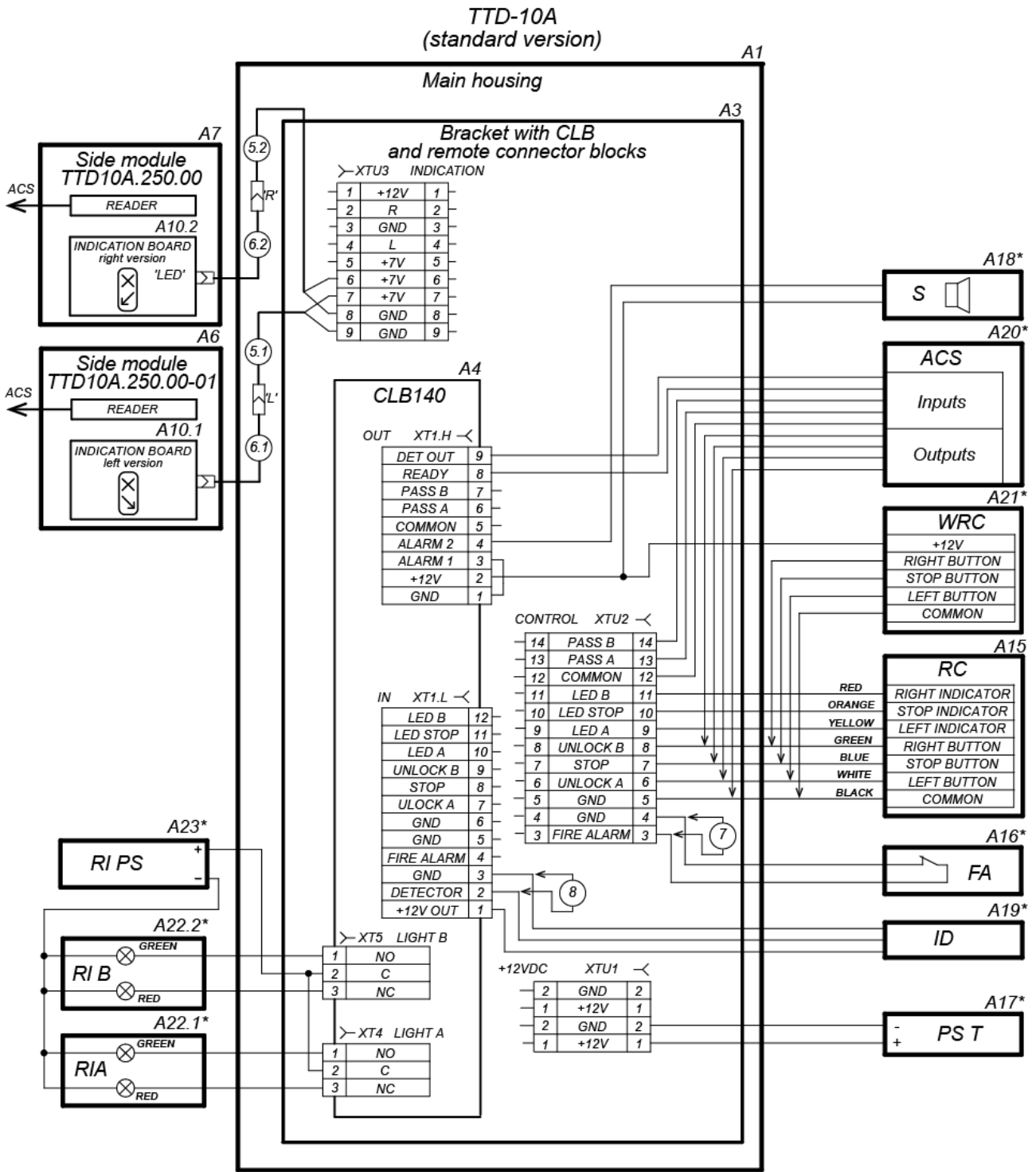

Figure 19. Scheme of internal connections (main housing)

Figure 20. Connection layout of the turnstile (standard version) and additional equipment[1]

---

[1] Elements of the scheme are listed in Table 5.
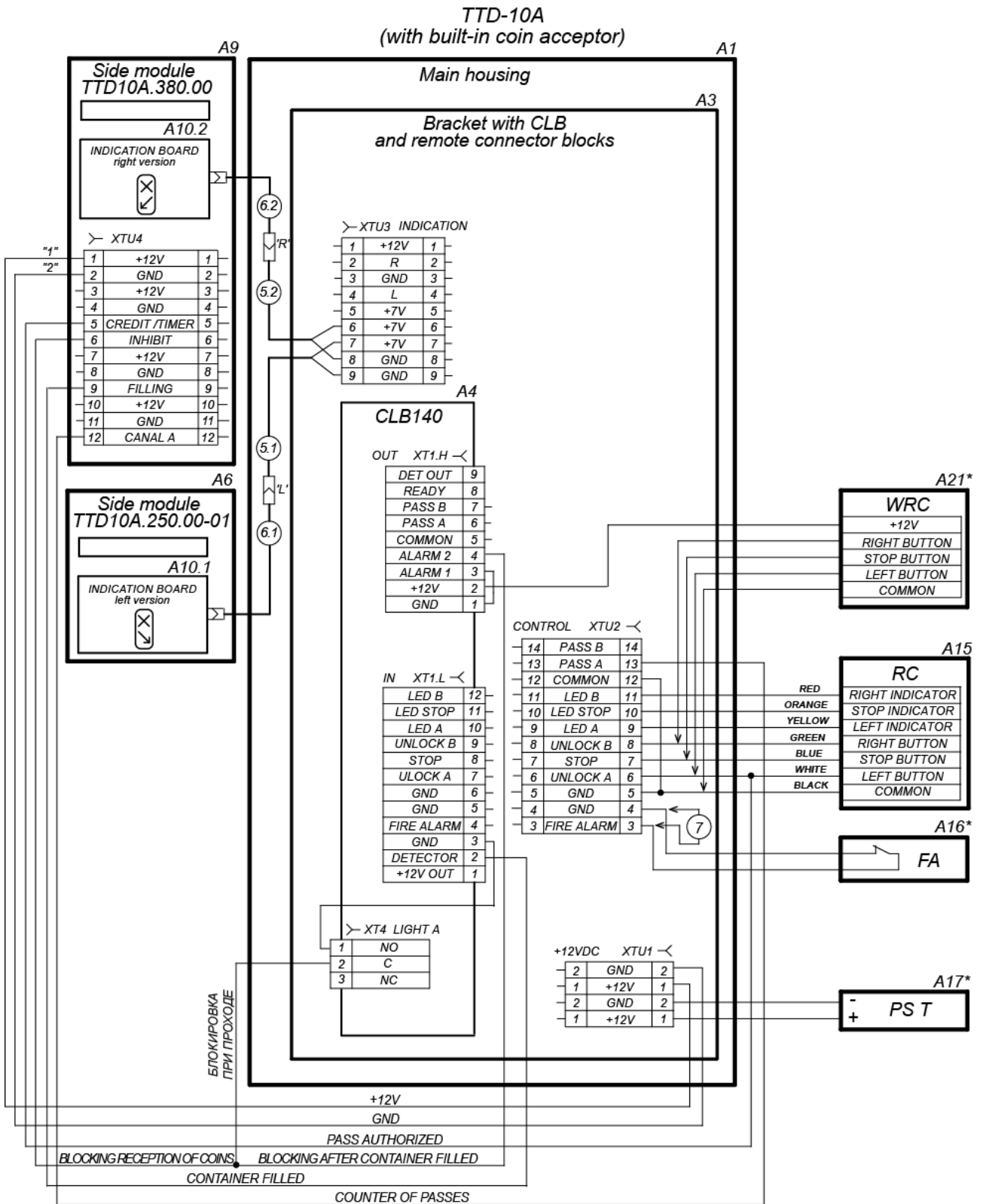Elements, marked with a star sign (*) are not included in standard delivery set.
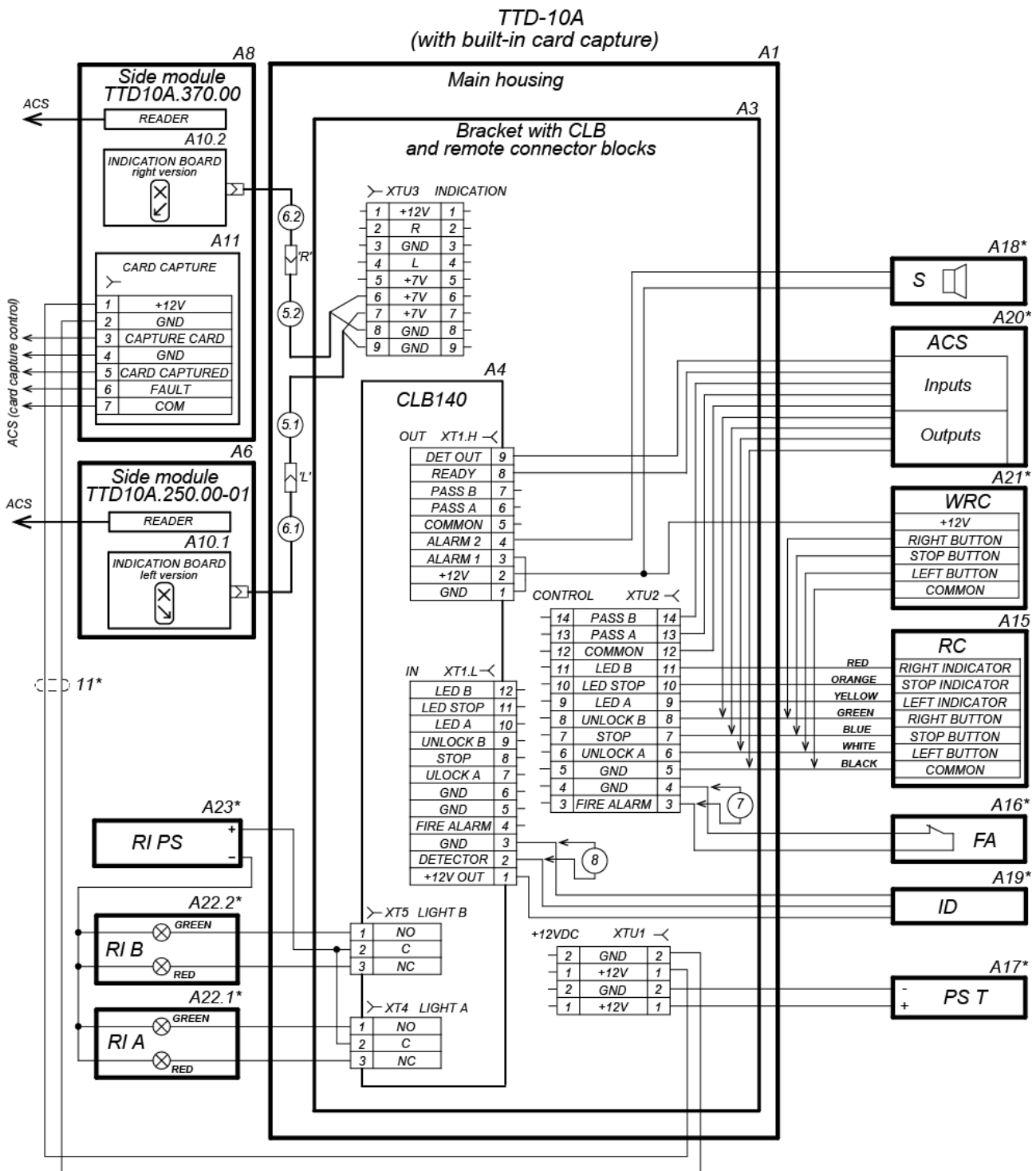
**Figure 21. Example of connection layout of the turnstile
(version with a card capture reader *TTD-10AC*) and additional equipment[1]**

---

[1] Elements of the scheme are listed in Table 5.
Elements, marked with a star sign (*) are not included in standard delivery set.

Figure 22. Example of connection layout of the turnstile (version with a coin acceptor *TTD-10APE*) and additional equipment[1]

---

[1] Variant without connection to the ACS controller (connection to ACS is similar to Fig.20).
  Connecting remote indicators, ID and siren in this version is not possible.
  Elements of the scheme are listed in Table 5.
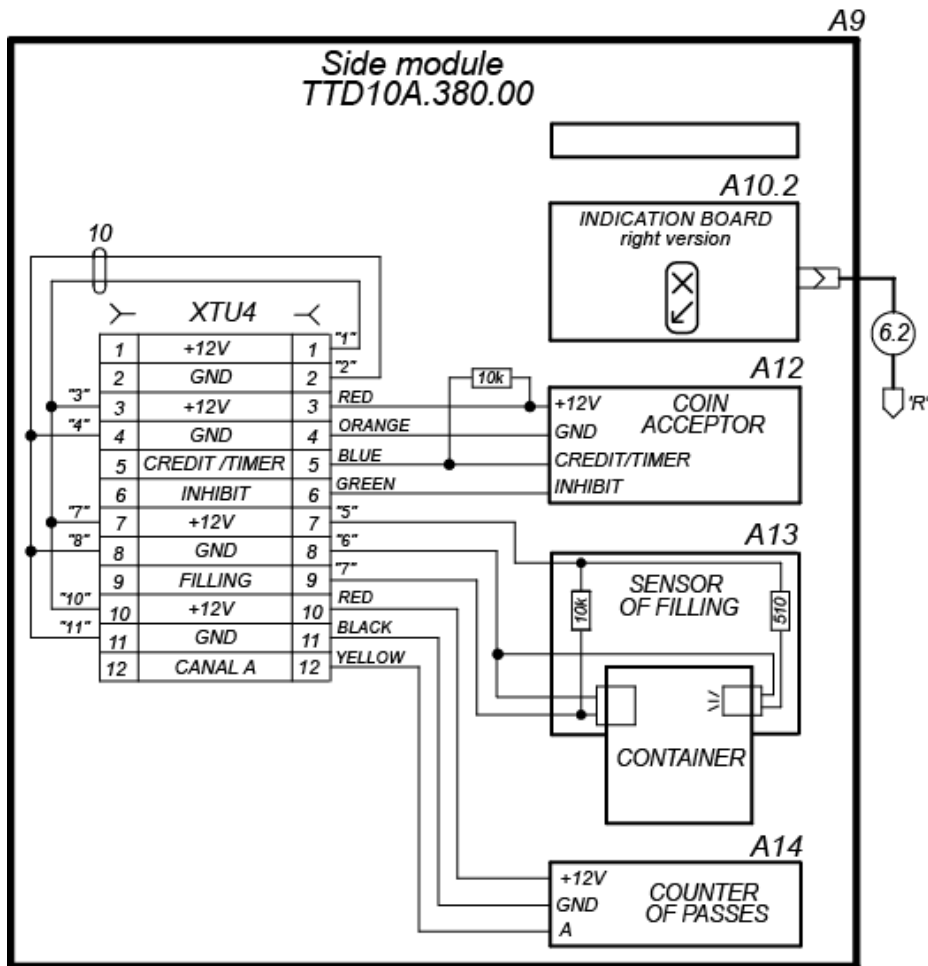 Elements, marked with a star sign (*) are not included in standard delivery set.

Figure 23. Scheme of internal connections (side module with built-in coin acceptor)

Table 5. Elements of the connection layouts

Legend	Name	Q-ty	Figure
A1	Main housing	1	19, 20, 21, 22
A2	Main cover	1	19
A2.1	Main cover indication block	1	19
A3	Bracket with CLB and remote connector blocks	1	19, 20, 21, 22
A4	Control logic board *CLB.140*	1	19, 20, 21, 22
A5	Control mechanism	1	19
A5.1	Rotation sensor unit	1	19
A5.2	Electromotors	1	19
A5.3	Electromagnet	1	19
A6	Side module TTD10A.250.00 (standard right)	1	19, 20, 21, 22
A7	Side module TTD10A.250.00-01 (standard left)	1	20
A8	Side module TTD10A.370.00 (with card capture reader)	1	21
A9	Side module TTD10A.380.00 (with coin acceptor)	1	22, 23
A10.1	Side indication block, left version	1	20, 21, 22
A10.2	Side indication block, right version	1	20, 21, 22
A11	Card capture reader	1	21
A12	Coin acceptor ICT UCA2	1	23
A13	Sensor of container filling	1	23

33

Legend	Name	Q-ty	Figure
A14	Counter of passes Yenox H2-7EA2	1	23
A15	RC-panel	1	20, 21, 22
A16[1]	Emergency opening device (*Fire Alarm*)	1	20, 21, 22
A17[1]	Turnstile power supply DC 12V	1	20, 21, 22
A18[1]	Siren DC12V	1	20, 21
A19[1]	Intrusion detector	1	20, 21
A20[1]	ACS-controller	1	20, 21
A21[1]	WRC device	1	20, 21, 22
A22.1[1], A22.2[1]	Remote indicators	2	20, 21
A23[1]	Remote indicator power supply	1	20, 21
XTU1	Remote connector block *Klemsan* 1/4	1	20, 21, 22
XTU2	Remote connector block *Klemsan* 1/12	1	20, 21, 22
XTU3	Remote connector block *Klemsan* 1/12	1	20, 21, 22
XTU4	Remote connector block *Klemsan* 1/12	1	22, 23
1	Internal turnstile power cable	1	19
2	Internal turnstile control cable	1	19
3	Internal cable to indication connector	1	19
4	Main cover indication cable	1	19
5.1, 5.2	Indication cables from the main housing to the side modules	2	19, 20, 21, 22
6.1, 6.2	Indication cables from the side modules	2	20, 21, 22
7	Wire jumper. Installed when the emergency opening device (A16) is not connected, installed on default	1	19, 20, 21, 22
8	Wire jumper. Installed when the intrusion detector (A19) is not connected, installed on default.	1	19, 20, 21
9	Wire-splitter of terminal block *XTU3*	1	19
10	Wire-splitter of terminal block *XTU4*	1	23
11[1]	Power cable of the built-in card capture reader (for *TTD-10AC*)[2]	1	20
12[1]	Power cable of the built-in coin acceptor (for *TTD-10APE*)[3]	1	21

---

[1] Not included in standard delivery set.

[2] In the circuit of Fig. 20 shows one of the examples for connecting the power of the card capture reader, the power cable is not included in the delivery set.

[3] In the circuit of Fig. 21 shows one of the examples for connecting the power of the coin acceptor, the power cable is not included in the delivery set.

9   OPERATION INSTRUCTIONS

When operation the equipment, observe precautions (Clause 7.2).

> ***Warning!***
> - Do not move through the turnstile passage area any objects with dimensions exceeding the width of the passageway.
> - Do not jerk and hit any elements of the turnstile so as to prevent their mechanical deformation.
> - Do not dismantle or adjust mechanisms ensuring operation of the turnstile.
> - Do not use substances for cleaning of the turnstile that may cause mechanical damage or corrosion of the surfaces.

9.1   Power-up

Follow these steps:

1. Connect the turnstile power supply unit to the AC outlet with the voltage and frequency rating according to the certificate for the power supply unit.
2. Turn on the power supply. Red indicators (ban on passage) will light up on the main cover indication block, on the RC-panel the red indicator above "*Always locked*" will light up.
3. Manually lift up the folding arm. The arm will be fixed in this position.
4. Check operation of the intrusion detector and siren (if included in the delivery set and installed accordingly), as well as the operation of other installed additional equipment in accordance with their operational documentation.

The turnstile is ready for operation.

9.2   Pulse control mode

See Table 6 for the operating modes set from the RC-panel and for the corresponding indication. Setting the operating modes for each direction is independent, i.e. setting the operating mode for one direction does not change the operating mode set earlier for the opposite one.

The RC-panel overall view is given in Fig. 6. Herewith:
- In the *"Single passage in the set direction"* mode the turnstile will close automatically after a person's passage in the set direction. The turnstile will also close automatically, if the passage is not made within 5 sec.
- In the *"Bi-directional single passage"* mode after the passage in one direction the countdown of the passage waiting time (5 sec.) for the opposite direction is recommenced.
- The *"Single passage in the set direction"* mode can be changed to the *"Always free"* mode for the same direction, or to the *"Always locked"* mode.
- The *"Free passage in the set direction"* mode can be changed to the *"Always locked"* mode only.

> ***Note:***
> Pressing the button on the RC-panel corresponds to the low-level signal supply to the contacts ("*Unlock A*", "*Unlock B*" and "*Stop*") of the **XTU2** connector block relatively to the contact "*GND*".
>
> Operation of the turnstile with the help of the WRC is similar to control from the RC-panel. The buttons on the WRC perform the same functions as the RC-panel buttons.

Table 6. Pulse control mode (the jumper is set on the *J1* connector)

The turnstile operating modes	Actions to do	Indication		Turnstile status
		On the RC-panel	On the turnstile	
"Always locked" (Locked for entry and exit)	Press the **STOP** button on the RC-panel	The red indicator above the **STOP** button is on	The "Red crosses" for each passage direction are on	The turnstile is locked
"Single passage in the set direction" (open for passage of one person in the chosen direction)	Press the **LEFT**/ **RIGHT** button on the RC-panel	The green indicator above the button of the chosen passage direction *"Left"/ "Right"* is on	The "Green arrow" in the chosen passage direction is on	When the passage is completed, the turnstile is locked
"Bi-directional single passage" (open in both directions for 'one-by-one' passage)	Press both the **LEFT** and **RIGHT** buttons on the RC-panel simultaneously	The two green indicators (*"Left"* and *"Right"*) are on	The "Green arrow" for each passage direction is on. After the passage in the chosen direction the "Red cross" is on for that direction.	The turnstile is locked in the direction of completed passage
"Free passage in the set direction" (open for free passage in the chosen direction)	Press the **STOP** button and the button corresponding to the chosen passage direction **LEFT**/ **RIGHT** simultaneously	The green indicator above the button of the chosen passage direction *"Left"/ "Right"* is on	The "Green arrow" in the chosen passage direction is on.	Turnstile remains open in the set direction
"Free passage in the set direction and single passage in the opposite direction" (open for free passage in the chosen direction and for passage of one person in the opposite direction)	Set the *"Free passage in the set direction"* mode for one direction and *"Single passage in the set direction"* for the other.	The two green indicators (*"Left"* and *"Right"*) are on.	The "Green arrows" for each passage direction are on. After the single passage the "Red cross" is on.	After the passage in the free passage direction the turnstile remains open in both directions. After the passage in the single passage direction the turnstile remains open in the free passage direction but it gets locked in the single passage direction
"Always free" (open for entry and exit)	Press all the 3 buttons on the RC-panel simultaneously: **LEFT**, **STOP** and **RIGHT**	The two green indicators (*"Left"* and *"Right"*) are on	The "Green arrows" for each passage direction are on.	The turnstile remains open
"Antipanic"	All RC-commands are ignored	Both *"Left"* and *"Right"* green indicators flash	The arrows of both directions flash	The barrier bar is lowered to the vertical position, the passage through the turnstile is unimpeded

9.3 Potential control mode

See Table 7 for the operating modes set from the RC-panel. Setting the operating modes for each direction is independent, i.e. setting the operating mode for one direction does not change the operating mode set earlier for the opposite one.

If by the moment of passage through the turnstile the low level is present on the contact, corresponding to the set passage direction, the turnstile remains open in the set direction.

For the ACS outputs note the following:

- High level — contacts of the output relay are broken or the output transistor is closed.
- Low level — contacts of the output relay are closed or the output transistor is open.

Table 7. Potential control mode (the jumper is taken off from the J1 connector)

The turnstile operating modes	Actions to do	Indication		Turnstile status
		On the RC-panel	On the turnstile	
Both passage directions are locked (the turnstile is locked both for entry and exit)	The high level — on contacts "*Unlock A*" and "*Unlock B*" or low level — on the contact "*Stop*"	The red indicator above the **STOP** button is on	The "Red crosses" for each passage direction are on	The turnstile is locked
One of the passage directions is open (the turnstile is open for passage in the set direction)	The low level — on the contact corresponding to the passage direction, the high levels — on the other contacts	The green indicator above the button of the chosen passage direction "*Left*" / "*Right*" is on	The "Green arrow" in the chosen passage direction is on	When the passage is completed, the turnstile is locked
Both passage directions are open (the turnstile is open both for entry and exit)	The low level — on contacts "*Unlock A*" and "*Unlock B*". The high level — on the contact "*Stop*"	The two green indicators ("*Left*" and "*Right*") are on	The "Green arrows" for each passage direction are on	The turnstile remains open
«Antipanic»	All RC commands are ignored	Both "*Left*" and "*Right*" green indicators flash	The arrows of both directions flash	The barrier bar is lowered to the vertical position, the passage through the turnstile is unimpeded

9.4 The algorithm of the card capture reader operation [1]

The built-in card capture reader operation is possible only in the ACS. The ACS controller is configured to operate the built-in card capture reader in accordance with its operational documentation.

To present the access card to the reader, it's necessary to insert it into the card slot. For convenience of users in the standby mode, the receiving slot of the card capture reader is permanently illuminated by the built-in LED indicator.

If the presented card is a permanent employee card and does not require the withdrawal, the ACS controller allows the passage through the turnstile in the given direction (gives the appropriate signal to the turnstile control mechanism). The shutter, blocking access to the card collector, remains closed, preventing the accidental withdrawal of the card. The illumination of the card slot remains constant.

If the presented card is a temporary visitor card and requires the withdrawal, the illumination of the card slot will start flashing with a frequency of 2 times per second. The shutter, blocking access to the card collector, will open and the card will fall into the card collector.

---

[1] Modification with card capture reader **TTD-10AC**.

After the card withdrawal to the container, the shutter of the card capture reader automatically closes, the illumination of the card slot becomes permanent again, the ACS controller allows a single passage through the turnstile in the indicated direction.

If for some reason the card is not withdrawn during the **"Confirmation Timeout"** (set in the ACS) (for example, the visitor will not insert the card or it will get stuck in the slot), the ACS controller will prohibit passage in this direction and the illumination of the receiving slot will become permanent. After that, the access card will have to be taken out of the card slot and presented for rereading and withdrawal.

When the card collector is full, the "*Alarm*" signal is sent to the ACS controller, the illumination of the card capture reader card slot goes into the flashing mode with frequency of 1 time in 2 seconds, thereby warning about the need to free the collector from the withdrawn cards. If the collector is not emptied, then after receiving 10 more cards, the work of the card capture reader is blocked, the illumination of the card slot is extinguished.

The "*Alarm*" signal release and card capture reader unblocking occur automatically after the collector is emptied from the cards (the procedure for the removal and installation of the collector is given in Clause 9.6).

The "*Alarm*" signal is also sent to the ACS controller in case of card capture reader malfunction, the illumination of the receiving slot goes out until the fault is eliminated. If the card collector, installed in the turnstile, is empty but the blocking and the "*Alarm*" signal are not removed, the probable cause of this may be the malfunctions of the units providing the card capture reader operating. In this case, we advise to consult the nearest PERCo service center. The list of service centers is given in the *Certificate* of the turnstile.

9.5   The algorithm of the coin acceptor operation [1]

⚠ *Attention!*

The coin acceptor is a complex technical device, the use of the coin acceptor is allowed only in accordance with its operating documentation.

The coin acceptor can be used both in the ACS, and without it and additional devices. Features of the operation in the ACS are determined by the capabilities and settings of the system itself.

The standard algorithm of the coin acceptor operation

For the authorized passage through the turnstile, you need to insert the required number of coins (tokens) one by one into the slot of the coin box. The number of coins (tokens) is determined by the settings of the coin acceptor (see Clause 5.2.10). When the specified amount is received, the coin acceptor gives the permission of the passage to the turnstile control mechanism, the turnstile is unlocked in this direction, the coin acceptor blocks reception of coins (tokens) until the end of the passage.

ℹ *Note:*

Upon delivery, the coin acceptor is programmed to accept standard Russian coins. To accept coins (tokens), different from the standard Russian coins, it is necessary to reprogram the coin acceptor with a special programming tool and software (supplied by the coin acceptor manufacturer).

After the passage, the blocking of the coins (tokens) acceptance is removed.

When the coin acceptor is full, the acceptance of coins (tokens) is blocked. The high-level signal is generated at the output of the filling sensor assembly, which is used to inform about the necessity to empty the coin acceptor. When the coin acceptor is emptied (see Clause 9.6), the acceptance of coins is resumed.

The pulse counter (located inside the side module) along channel A counts the number of authorized passage. The counter has a reset button).

In case of malfunctions of the built-in coin acceptor, we advise to consult the nearest PERCo service center. The list of service centers is given in the *Certificate* of the turnstile.

---

[1] Modification with coin acceptor ***TTD-10APE***.

9.6   Removing and installation of the card collector or coin acceptor [1]

To remove the card collector (container of the coin acceptor) from the turnstile, do the following:

1. Turn the key of the cover lock of the card reader (coin acceptor) until it stops (open the lock).
2. Pull the key of the lock, thereby opening the cover and providing access to the card collector/container.
3. Remove the card collector/container from the turnstile.

The container of the coin acceptor **TTD-10APE** is also equipped with a carry handle and a lid with the lock to prevent thefts during encashment. **Be careful, the coin-filled container can weigh up to 20 kg!**

The installation of the card collector/container into the turnstile is carried out in the reverse order.

10   ACTIONS IN EMERGENCY

For urgent evacuation of people from business facilities in case of fire, natural calamities and other emergencies, the additional emergency exit should be provided. Such emergency exit can be the automatic anti-panic rotary section **BH-02**.

The additional emergency exit can be provided by the turnstile passage area. Construction of the turnstile enables immediate clear of passage way without use of any special keys or tools. By putting the "*Fire Alarm*" signal to turnstile logic board the barrier arm automatically falls down allowing the free exit. The arm also drops down automatically at a power supply loss.

11   TROUBLESHOOTING

Possible faults, which can be cleared by the users themselves, are listed in Table 8.

Table 8. Possible faults and remedy

Fault	Possible cause	Remedy
At the power-up the turnstile doesn't work, and there is no light indication on the turnstile housing and the RC-panel	No supply voltage to the CLB	Switch off the turnstile power supply from the AC mains, open the turnstile housing cover. Check the power cable serviceability and reliability of its connection
The turnstile is not controlled in one of the directions, and there is light indication on the turnstile housing and on the RC-panel	The CLB does not receive a control signal for this direction	Switch off the turnstile power supply from the AC mains, open the turnstile housing cover, and remove the outer panel. Check the RC-panel / WRC kit / ACS-controller cable serviceability and reliability of its connection

In case of other faults and defects, please apply to the PERCo Technical Support Department (the PERCo TSD).

12   MAINTENANCE

The turnstile maintenance is required once a year and in case of any technical failures the turnstile must be serviced immediately after repair works. The maintenance should be carried out by qualified mechanic only after careful study of this Manual.

To do maintenance proceed as follows:

1. Disconnect the turnstile power supply from the AC mains, the folding arms will automatically fall down.
2. Remove the hub with the barrier arms by unscrewing the three screws M8.
3. Molybdenum grease lubricate in the hub elements.
4. Remove the turnstile main cover (2) from the turnstile housing as described in Section 6. Lay the cover on a flat steady surface.

---

[1] Modifications with card capture reader **TTD-10AC** or with coin acceptor **TTD-10APE**.

5. To access the rotation unit of turnstile barrier arms, take off the bracket with control board and remote connector block. For this purpose: unscrew 6 screws, which fix the bracket on the turnstile housing and accurately take a bracket aside without damaging connected cables.

6. Inspect the resetting mechanism (a pusher, springs and a roller), optic sensors and a damper (Ref. Fig. 24).

⚠️ **Attention!**
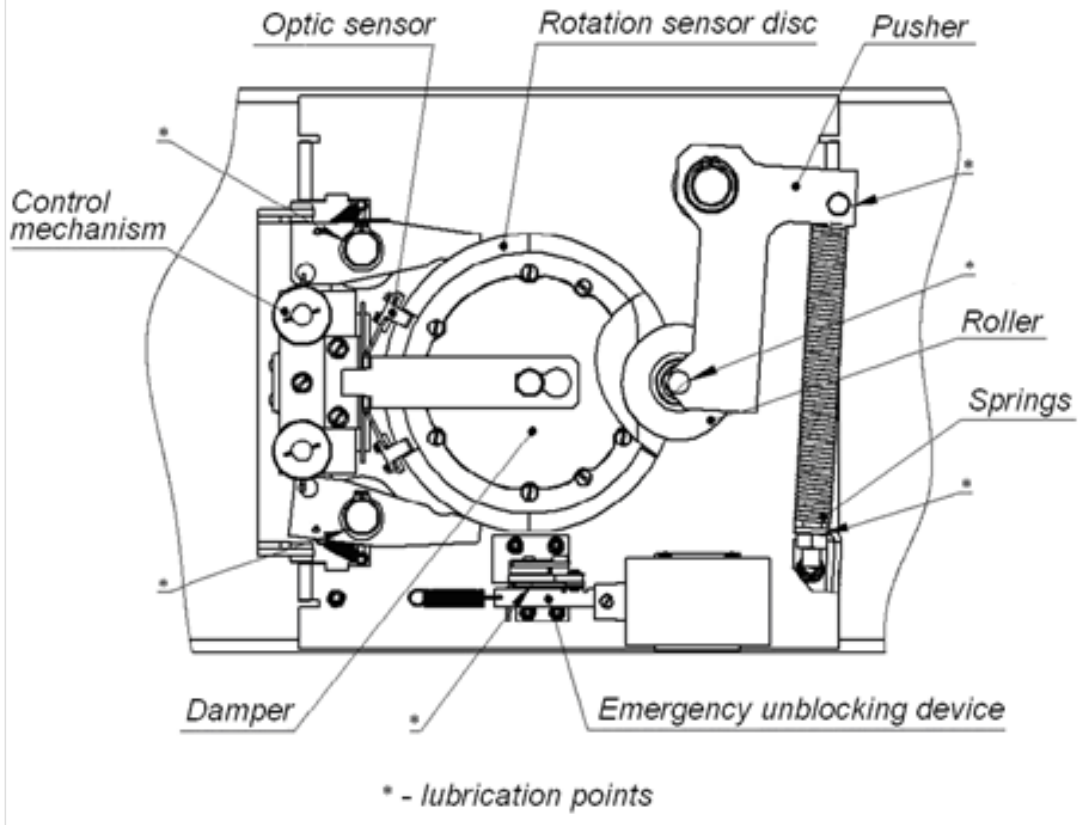Avoid ingress of lubricant on the rotation sensor disc and the roller surfaces.

Figure 24. Interior components of the turnstile mechanism

7. Remove dust from a rotation sensor disc, located in the spacing of the rotation optic sensors, with alcohol-gasoline blend applied with a cloth. Avoid ingress of dust into the operational spacing of the optic sensors.

8. Lubricate with machine oil (lubrication points are marked in Fig. 24):
   - four bushes of the resetting mechanism (two – on the rotation axis of the pusher;
   - two – on the fastening axis of the springs as well as holes in the fastening parts of the springs); 2-3 drops of oil in each lubrication point.

9. Fix the bracket with control board and remote connector block in an order, opposite to removal.

10. Establish a hub with barrier arms into place in the reverse order.

11. Check reliability of the cable connections to the CLB connector blocks and if necessary tighten the cable fixing screws.

12. Check reliability of the barrier arm (5) fastening.

13. Remove side modules (6, 13, 17) in accordance with Clause 8.4 of this Manual. Check reliability of the turnstile housing fastening to the floor and if necessary, tighten the anchor bolts.

14. Put back side modules in an order, opposite to removal.

15. Return the main cover (2) into its operating position.

16. Energize the turnstile and lift up the folding arm.

17. Check operation of the turnstile in accordance with Section 8.5 of this Manual.

After maintenance works are complete the turnstile is ready for further operation.

In case of any defects revealed during visual check please apply to the PERCo Technical Support Department (the PERCo TSD).

13   TRANSPORTATION AND STORAGE

The turnstile in the original package should be transported in closed freight containers or other closed type cargo transport units.

Do not stack the boxes with the turnstiles during transportation and storage.

Storage of the turnstile is allowed in dry indoor facilities at an ambient air temperature from –40°C to +55°C at relative air humidity 98% at +25°C.

After transportation or storage at temperatures below zero or at high air humidity, prior to installation the turnstile must be kept in the original package for no less than 24 hours indoors under conditions corresponding to operation conditions (Ref. Section 2).

APPENDIXES

Appendix 1. Design of different types of turnstile side covers

The side covers of the turnstile are a variable functional element of the product and are designed for different application, which is determined by their type. The type of each cover is selected by the customer when ordering the turnstile. Types of manufactured side covers and their application are shown in Table 1.

Side cover is installed on the side module from the top, four threaded posts must correspond with the holes in the module post. The cover is fixed with 4 nuts with washers (S5 key).

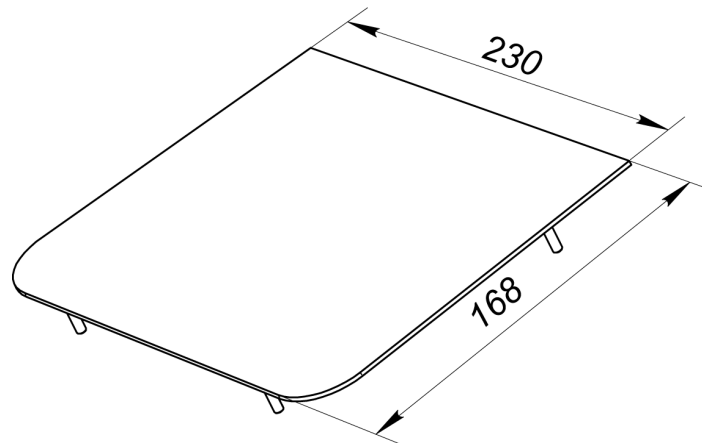1. Side cover **C-10B** – is a cover without additional functions, made of stainless steel.

Figure 25. Dimensions of the side cover C-10B

2. Side cover **C-10R** is designed for installation of the built-in RFID reader into the turnstile, it is made of stainless steel, it has a window made of radio-transparent material.
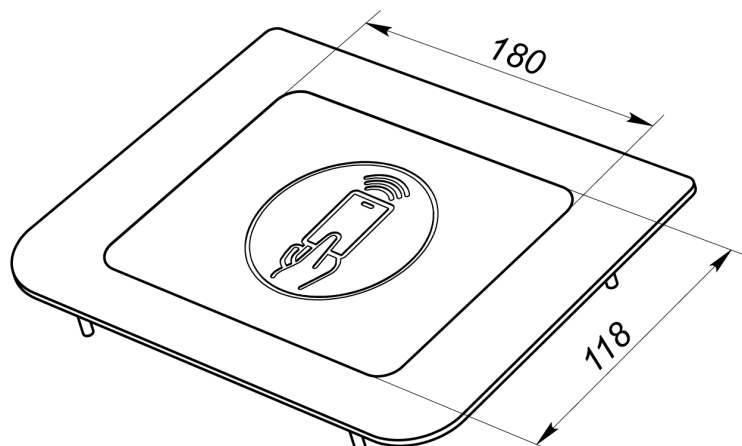

Figure 26. Side cover C-10R

3. Side cover **C-10F** is designed for installation of the biometric fingerprint reader into the turnstile.

   It is made of stainless steel, has a bracket-plate for installation of the reader. The plate is turned 20° from the rolling axis of the turnstile towards the passage to facilitate the reading, it is possible to turn the site to the other side, depending on the side of the turnstile where the side cover will be installed. To do this, remove the bracket-plate from the cover by unscrewing two nuts and reset it to a different position.
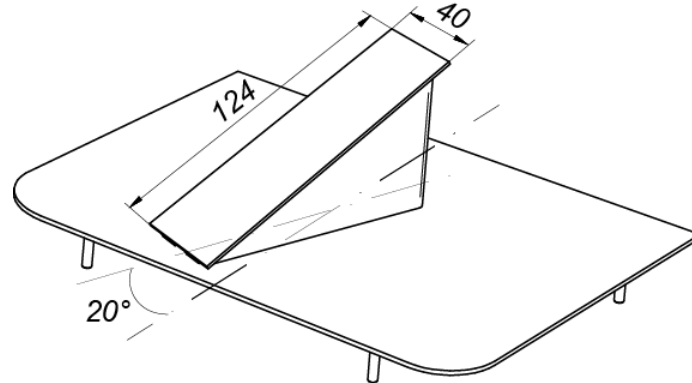
Figure 27. Side cover _C-10F_

4. Side cover **C-10RC** is designed only for installation into the turnstile in the **TTD-10AC** version with built-in card capture reader.

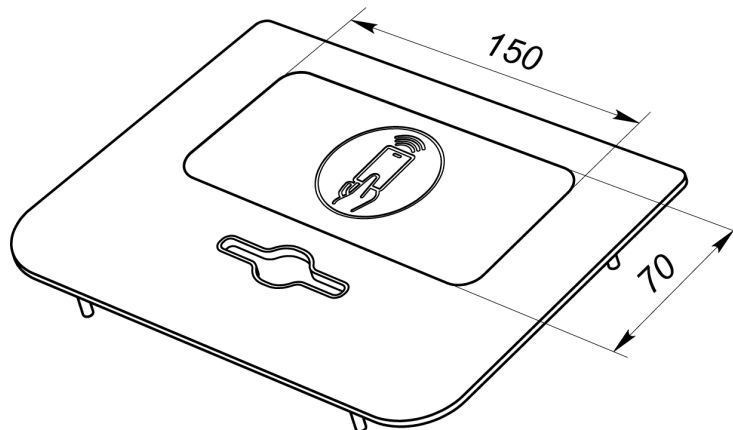   It is made of stainless steel, has a slot for cards.

Figure 28. Side cover _C-10C_

5. Side covers **C-10P.1 C-10P.2** are designed for installation of the built-in RFID reader and the face recognition terminal or breathalyzer (alcohol detector).

   It is made of stainless steel, it has a window made of radio-transparent material and a rack for installation bracket type BS with the additional equipment.

Additional equipment	Bracket	Cover type
"Suprema FaceStation 2" FRT	**BS10**	**C-10P.1**
"Suprema FaceLite " FRT	**BS11**	
"ZKTeco FaceDepot 7A" FRT	**BS7A**	**C-10P.2**
"ZKTeco FaceDepot 7B" FRT	**BS7B**	
"ZKTeco ProFace X" FRT	**BS8**	
"ZKTeco SpeedFace V5" FRT	**BS9**	
" Alkobarrier " breathalyzer	**BS12**	
"Dingo B-02" breathalyzer	**BS13**	
Other types of breathalyzers and FRT	**BS14** (universal)	

BS10
(BS11)

Suprema
FaceStation2
(FaceLight)

Screw M3×3

80

C-10P.1

BS7
(BS8)
(BS9)
(BS12)
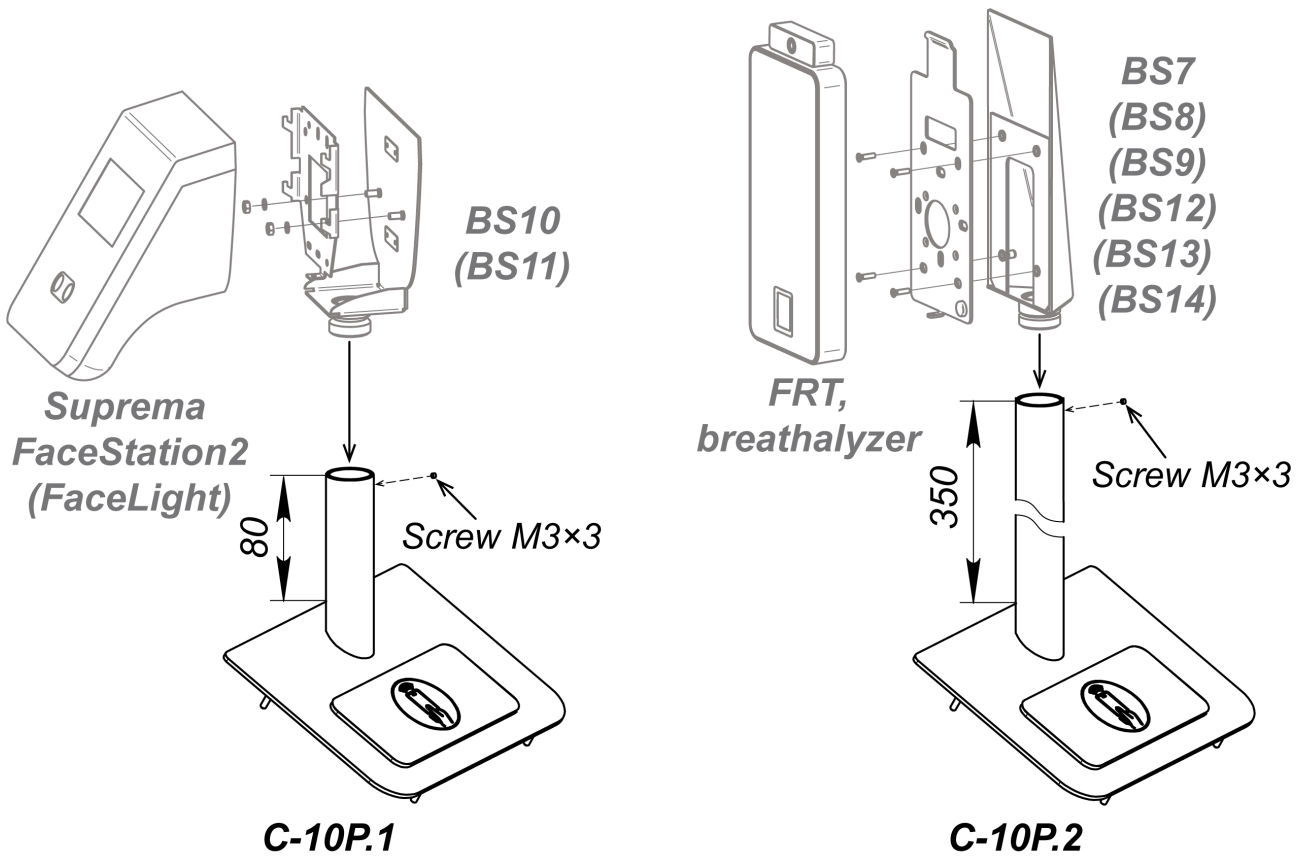(BS13)
(BS14)

FRT,
breathalyzer

Screw M3×3

350

C-10P.2

Figure 29. Side covers *C-10P.1*, *C-10P.2*

6. Side cover *C-10Q* is designed for installation of the built-in barcode reader into the turnstile.

It is made of stainless steel, has a window from transparent tinted glass. Recommended dimensions of the built-in barcode scanner (L × W × H), taking into account the possibility to adjust the scan axis relative to the window axis in the lid of the *C-10Q*: no more than 156×100×70 mm.
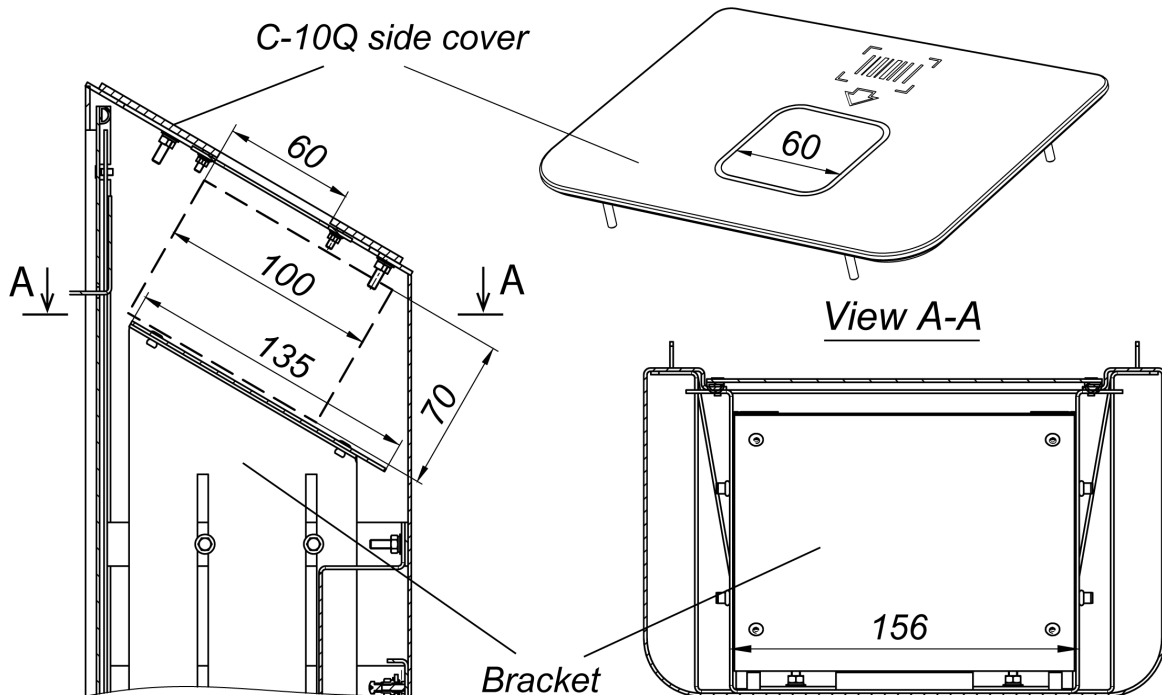

C-10Q side cover

60

60

A

A

100

135

70

View A-A

156

Bracket

Figure 30. *C-10Q* side cover and the installation procedure of the barcode scanner (the dotted line shows the scanner dimensions)

Appendix 2. Control signal algorithm at pulse control mode

Note:

For the RC-panel:
- active front — pressing of the relevant button on the RC-panel;
- low level— the relevant button on the RC-panel has been pressed;
- high level — the relevant button on the RC-panel has not been pressed.

The command is a signal active front (signal transfer from the high level to the low level) at any of the contacts at presence of the corresponding signal levels at the other contacts. The following commands can be formed by sending a low-level signal to the contacts "*Unlock A*", "*Stop*" and "*Unlock B*" of the **XT1.L** (or **XS1**) connector block relatively to the contact "*GND*":

Always locked (locked for entry and exit). Active front is at the contact "*Stop*" while there is a high level at the contacts "*Unlock A*" and "*Unlock B*". Both passage directions are locked at this command.

Single passage in the direction A (open for passage of one person in the direction A). Active front is at the contact "*Unlock A*" while there is a high level at the contacts "*Stop*" and "*Unlock B*".

At this command the passage direction A opens either for 5 sec. or until the passage has been made in this direction or until the command **«Always locked»**, and the status of the passage direction B does not change at that. The command is ignored if at the moment of its receipt the status of the passage direction A is **«Always free»**.

Single passage in the direction B (open for passage of one person in the direction B). Active front is at the contact "*Unlock B*" while there is a high level at the contacts "*Stop*" and "*Unlock A*".

At this command the passage direction B opens either for 5 sec. or until the passage has been effected in this direction or until the command «Always locked», and the status of the passage direction A does not change. The command is ignored if at the moment of its receipt the status of passage direction B is «Always free».

Bi-directional single passage (open in both directions for 'one-by-one' passage). Active front is at the contact "*Unlock A*" while there is a low level at the contact "*Unlock B*" and a high level at the contact "*Stop*", or active front is at the contact "*Unlock B*" while there is a low level at the contact "*Unlock A*" and a high level at the contact "*Stop*".

At this command the both passage directions open either for 5 sec. each or until the passage has been effected in the given direction or until the command **«Always locked»** is received. The command is ignored for the passage direction, which status at the moment of its receipt is **«Always free»**.

Free passage in the direction A (open for free passage in the direction A). Active front is at the contact "*Unlock A*" while there is a low level at the contact "*Stop*" and a high level at the contact "*Unlock B*", or active front is at the contact "*Stop*" while there is a low level at the contact "*Unlock A*" and a high level at the contact "*Unlock B*".

At this command the passage direction A opens until the command **«Always locked»** is received; the status of the passage direction B does not change at that.

Free passage in the direction B (open for free passage in the direction B). Active front is at the contact "*Unlock B*" while there is a low level at the contact "*Stop*" and a high level at the contact "*Unlock A*", or active front is at the contact "*Stop*" while there is a low level at the contact "*Unlock B*" and a high level at contact "*Unlock A*".

At this command the passage direction B opens until the command **«Always locked»** is received; the status of the passage direction A does not change at that.

Free passage (open for free passage in both directions). Active front is at the contact "*Unlock A*" while there is a low level at the contacts "*Unlock B*" and "*Stop*", or active front is at the contact "*Unlock B*" while there is a low level at the contacts "*Unlock A*" and "*Stop*", or active front is at the contact "*Stop*" while there is a low level at the contacts "*Unlock A*" and "*Unlock B*".

The both directions open at this command until the command **«Always locked»** is received.

Appendix 3. Control signal algorithm at potential control mode

Note:

For an ACS-controller outputs:
- low level – either contacts of the output relay are closed or the output transistor is open.
- high level – either contacts of the output relay are broken or the output transistor is closed.

Both directions are locked (locked for entry and exit). There is a high level at the contacts "*Unlock A*" and "*Unlock B*", or a low level at the contact "*Stop*".

Both passage directions close at this command.

The direction A is open (open for passage in the direction A). There is a low level at the contact "*Unlock A*" while a high level is present at the contacts "*Stop*" and "*Unlock B*".

At this command the direction A opens up to the low-level signal removal from the contact A or until the command «Both directions locked» is received. The status of the direction B does not change at that

The direction B is open (open for passage in the direction B). There is a low level at the contact "*Unlock B*" while there is a high level at the contacts "*Stop*" and "*Unlock A*".

At this command the direction B opens up to the low-level signal removal from the contact B or until the command «Both directions locked» is received. The status of the direction A does not change at that.

Both directions are open (open for entry and exit). There is a low level at the contacts "*Unlock A*" and "*Unlock B*" while there is a high level at the contact "*Stop*".

Both directions open at this command up to the low-level signal removal from one of the contacts A (B) or until the command «Both directions closed» is received.

Appendix 4. Instructions for setting up the coin acceptor ICT UCA2

When setting up the coin acceptor, follow the instructions of the manufacturer http://www.ictgroup.com.tw/download/Installation%20Guide/UCA%20Series%20Installation%20Guide%20(EN)%20H4985K-R.pdf and this Manual.

1. Connect the coin acceptor to the PC COM port using the WEL-R7U06 cable (available separately), the connector is located on the side panel of the coin acceptor (see Fig. 31).
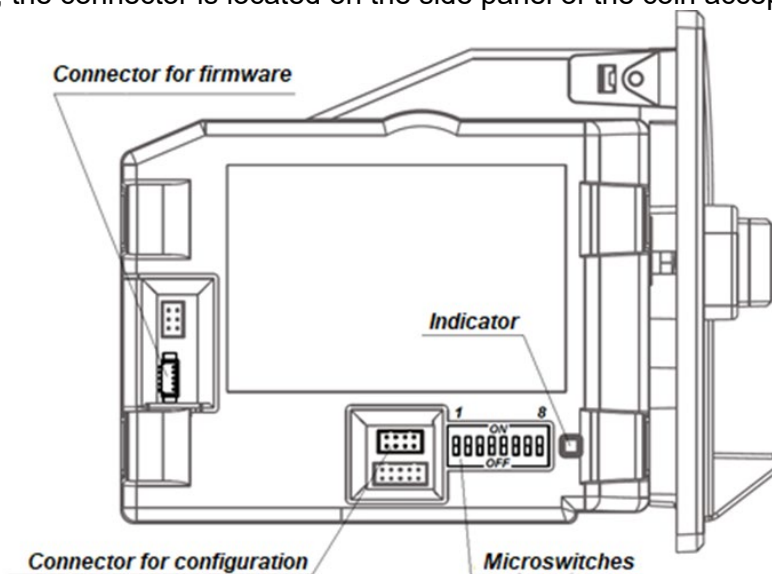

Figure 31. Connectors layout

2. Power the coin acceptor (contacts 1 and 2 of the **XTU4** terminal strip, see Fig. 23). The indicator lights up (shown in Fig. 31).

3. Install and run the application to configure the card capture reader settings "UCAx Tools" on the PC. The application window is shown in Fig. 32, connection with the coin acceptor is automatically installed immediately after the application is launched.
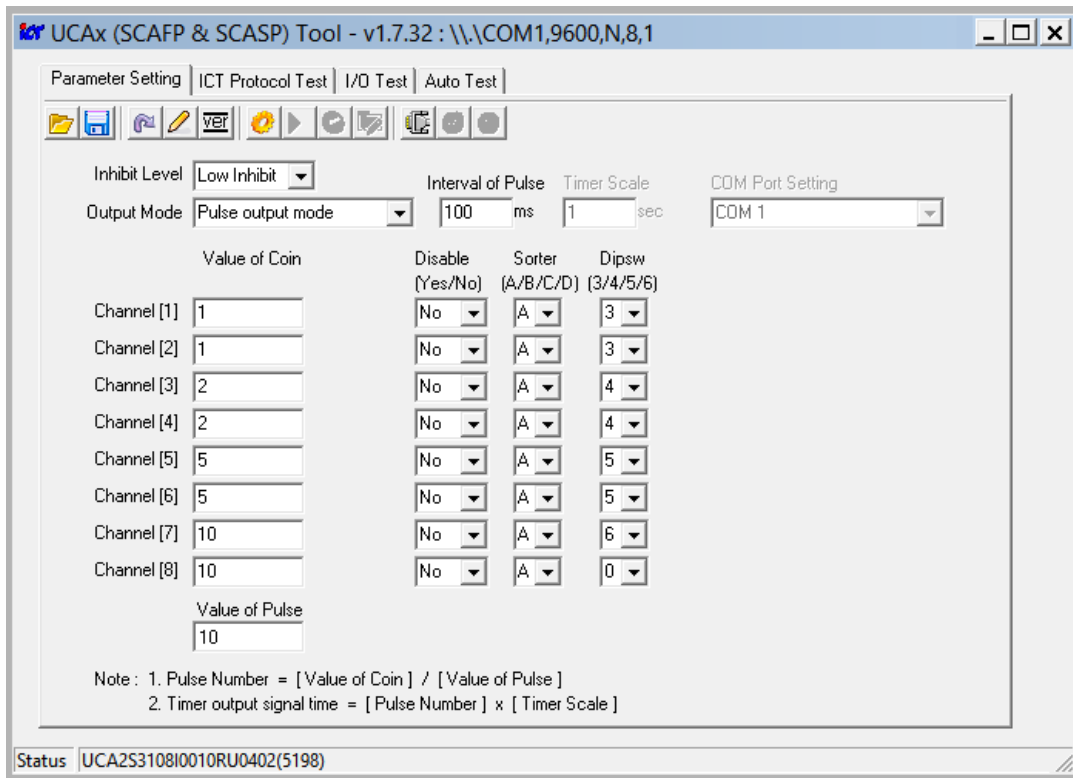

**Figure 32. The program window with settings
(an example of the configuration for receiving the amount of 10 rubles)**

4. The coin acceptor settings are made on the **Parameter Setting** tab:

- click the ⓥⓔⓡ **Read current version from UCA1** button, the current software version, for example, UCA2S3801I0010 (5198) will be displayed in the **Status** line (see Fig. 32);

- To read the current settings of the coin acceptor, click the ⟲ **Read setting from UCA1** button;

- in the coin acceptor parameters fields, set the following values:
  - in the **Inhibit Level** line - *Low Inhibit (*low-level blocking signal);
  - in the **Output Mode** line - *Pulse output mode* (pulse mode);
  - in the **Interval of Pulse** line - *100 ms* (pulse duration 100 ms);
  - in the table in the columns **Value of Coin**, **Disable**, **Sorter**, **Dipsw**, set the coin denominations and the corresponding parameters for coin acceptor channels (from the 1st to the 8th), as shown in Fig. 32.

5. In the **Value of Pulse** field, enter the amount to be paid by the user for the passage (Fig.32 shows an example of the amount of 10 rubles).

6. To record new settings to the coin acceptor memory, click the ✎ **Write setting into UCA1** button.

7. Check the newly written settings of the coin acceptor pressing the ⟲ **Read setting from UCA1** button.

8. Close the application, turn off the turnstile power, disconnect the cable from the computer and coin acceptor.

9. Check the position of the microswitches on the side cover of the coin acceptor (see Fig.31):
- **SW1**, **SW2** must be in the ON position - corresponds to a pulse time of 100 ms;
- Using **SW3**, **SW4**, **SW5** and **SW6** microswitches, select the denomination of the coins accepted by the coin acceptor (1 ruble, 2 rubles, 5 rubles and 10 rubles, respectively): to

prohibit coins of the corresponding denomination, set the microswitch to OFF position, to allow – to ON position (in this case, the set amount for the passage Value of Pulse must not contradict the nominal value of the allowed coins);

Note:

Upon delivery, the coin acceptor is programmed to accept standard Russian coins. To accept coins (tokens), different from the standard Russian coins, it is necessary to reprogram the coin acceptor with the help of a special programming tool and software (supplied by the coin acceptor manufacturer).

- *SW7 –* not used;
- *SW8* must be in the *ON* position - corresponds to a low-level pulse (relay closing) when receiving the amount specified in the **Value of Pulse** field.

Attention!

Changing the positions of the microswitches is carried out only when the coin acceptor is off.

10. Turn on the coin acceptor power and check if it accepts the set amount.

PERCo

Polytechnicheskaya str., 4, block 2
194021, Saint Petersburg
Russia

Tel: +7 812 247 04 64

**E-mail: export@perco.com
support@perco.com**

www.perco.com

www.perco.com