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MLU10

INSTRUCTIONS FOR ELECTRICAL CONNECTION AND WIRING OF THE TURNSTILE TYPE:

EASYGATE-SPT/SPD

with MLU10 electronics

1. INTRODUCTION

These instructions are an integral part of the INSTALLATION INSTRUCTIONS FOR THE EASYGATE-SPT/SPD TYPE TURNSTILE with MLU5 electronics, which contains all information concerning the mechanical and machine parts of the turnstile.

These instructions describe the differences in wiring and controlling the turnstile, which is equipped with the latest MLU10 control electronics.

These Installation Instructions are intended for technicians of the Service Department of the COMINFO Company, or workers who passed the Installation schooling provided by the COMINFO company. These Instructions describe installation procedure, electronic construction, function and connection of individual components of the whole EASYGATE system of turnstiles, which is intended for checking and control of passing persons.

Chapters dealing with connection of control electronics are for illustrative purposes intentionally compiled in a way so that the colour design of interconnecting cables is clear. In case of a printed version of these Instructions, the manufacturer strongly recommends to print them in colour. Instructions are intended for turnstiles fitted with the MLU10 electronics.

Turnstile installation must always be performed in accordance with approved project documentation!

The Instructions employ the following categories of safety instructions:

DANGER!
Mechanical danger. Omission of these instructions may cause personal injuries or device damage

WARNING!
Important information or procedure

NOTICE!
Information or procedure recommending how to use the device or its equipment optimally and thus prolong its lifetime, prevent potential damage and optimize work in relation to the safety standards.

2. ELECTRICAL CONNECTION OF THE TURNSTILE

The electrical installation of the turnstile must always be performed in accordance with approved project documentation!

2.1. LOCATION OF CONNECTING AND INTERCONNECTING TERMINAL BLOCKS
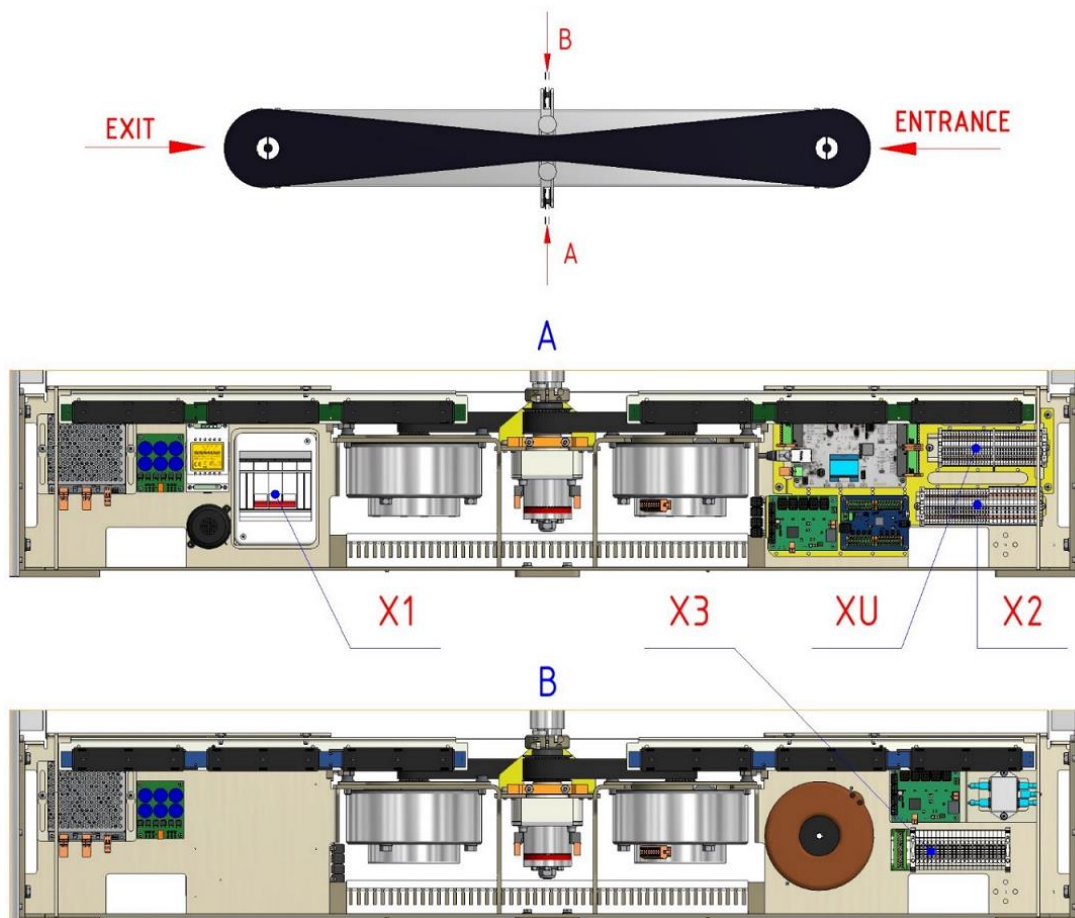
X1   - **24VAC** or **230VAC** main power terminal block
X2   - The MASTER turnstile terminal block
X3   - The SLAVE turnstile terminal block
XU   - USER terminal block

Layout of all devices is described in the *Layout of the devices in the turnstile.*

2.2. CONNECTION PROCEDURE

2.2.1. Connecting the power supply

⚠ **CONNECTION TO THE MAINS POWER SUPPLY MAY ONLY BE PERFORMED BY AN AUTHORIZED PERSON WITH THE APPROPRIATE QUALIFICATIONS.**

⚠ **THE SUPPLY VOLTAGE MUST MEET ALL THE REQUIREMENTS LISTED IN THE** *TURNSTILE POWER SUPPLY* **CHAPTER.**

⚠ **THE CONNECTION MUST ALWAYS BE MADE WHEN THE POWER SUPPLY IS SWITCHED OFF AND SECURED AGAINST TURNING ON.**

⚠ **IF THE TURNSTILE IS EQUIPPED WITH BACKUP UPS POWER SUPPLY, IT IS NECESSARY TO DISCONNECT IT.**

⚠ **BEFORE CONNECTING THE POWER SUPPLY CABLE, IT IS NECESSARY TO CHECK IF THE SUPPLY VOLTAGE VALUE CORRESPONDS WITH THE VALUE OF THE NOMINAL VOLTAGE ON THE PRODUCTION LABEL AND ADHERE TO THE LISTED POLARITY.**

IF YOU USE INCORRECT VALUE OR POLARITY, YOU MAY DAMAGE OR DESTROY THE ELECTRONIC INSTRUMENTS OF THE TURNSTILE AND PUT PEOPLE IN DANGER.

- **By default, the turnstile is made for 24VAC or 230VAC power supply.**

- **Connect the supply voltage to the X1 terminal in the MASTER turnstile according to following figure.**
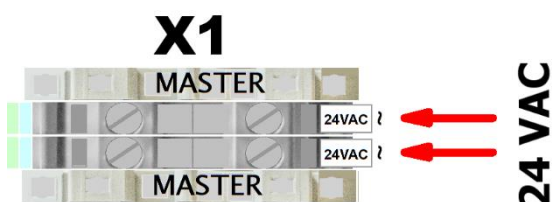
Connection of supply voltage in case of using the **24VAC** transformer.
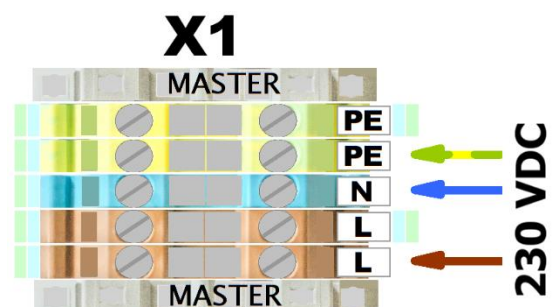
Connection of supply voltage in case of using the **230VAC** mains supply.

2.2.2. Interconnecting the MASTER and SLAVE turnstile.

IT IS ALWAYS NECESSARY TO ONLY USE CABLES PROVIDED BY THE COMINFO COMPANY FOR INTERCONNECTING TURNSTILES.

- Connect the supplied six-core Cable **nr. 1** to the **X2** terminal in the **MASTER** turnstile according to the wire colorings in the *Master X2 terminal block* diagram.

- Connect the second end of the cable **nr. 1** to the **X3** terminal in the **SLAVE** turnstile according to the wire colorings in the *Slave X3 terminal block* diagram.

- Connect the supplied four-core Cable **nr. 2** to the **X2** terminal in the **MASTER** turnstile according to the wire colorings in the *Master X2 terminal block* diagram.

- Connect the second end of the cable **nr. 2** to the **X3** terminal in the **SLAVE** turnstile according to the wire colorings in the *Slave X3 terminal block* diagram.

- Connect the supplied two-core Cable **nr. 3** to the **X2** terminal in the **MASTER** turnstile according to the wire colorings in the *Master X2 terminal block* diagram.

- Connect the second end of the cable **nr. 3** to the **X3** terminal in the **SLAVE** turnstile according to the wire colorings in the *Slave X3 terminal block* diagram.

- Pay special attention to the protective earthing conductor **PE**.

  - The supplied green-yellow wire conductor on the **230V** turnstile is connected to the **PE1** earthing terminal of the **MASTER** turnstile.

  - The second end of the conductor is connected to the **PE2** earthing terminal of the **SLAVE** turnstile.

2.2.3. Connecting the superior control system of the turnstile
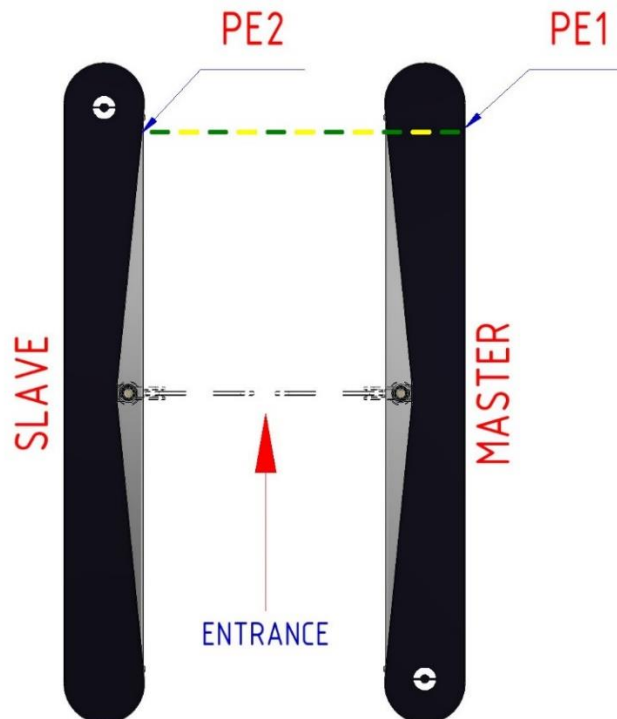
- All the input and output control signals are routed to the **XU** terminal in the **MASTER** turnstile.
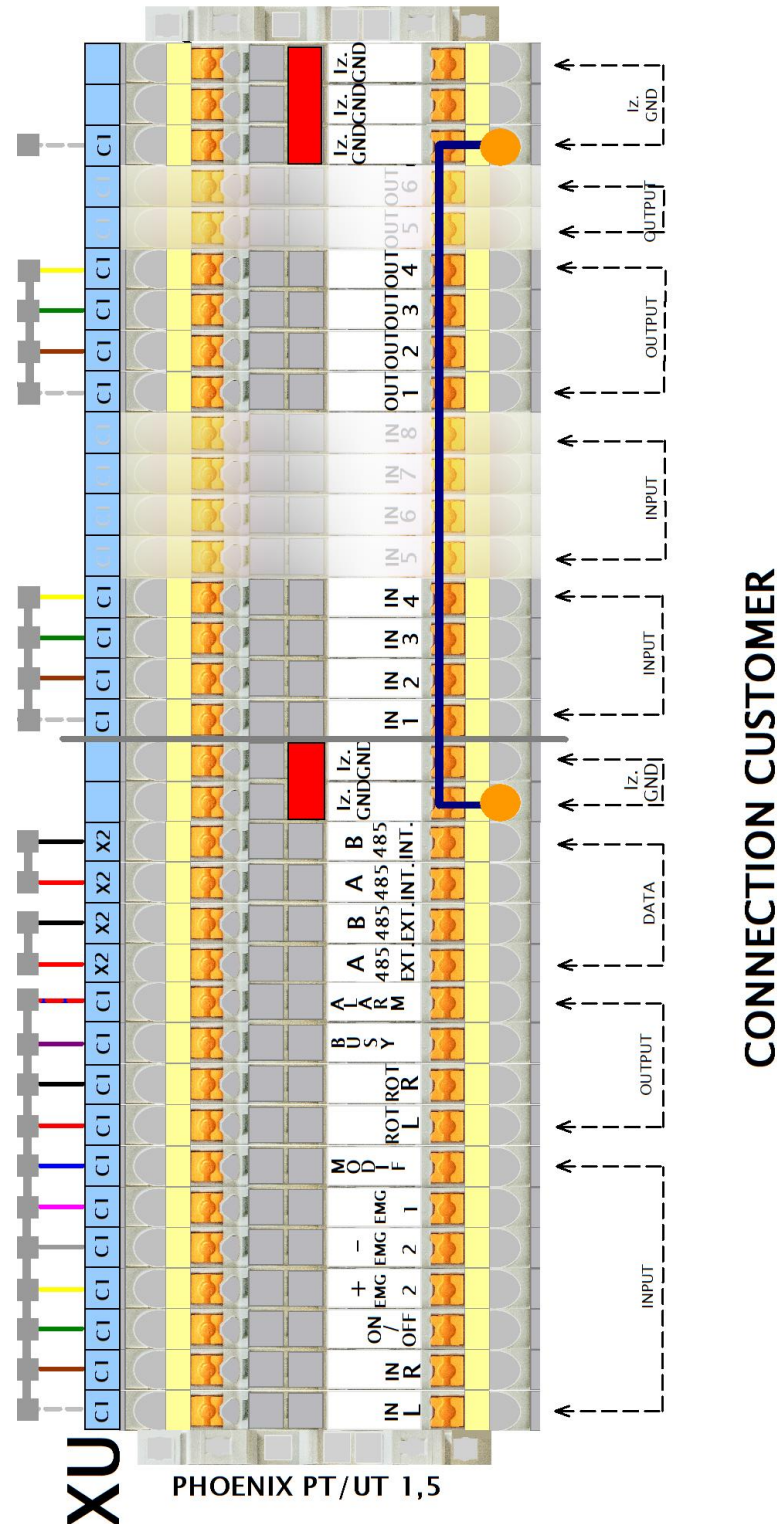
- When performing the connection, follow the *DESCRIPTION OF THE* TURNSTILE CONNECTION *chapter.*

- The function of the control signals is described in the *CONTROLLING BY STATUS* SIGNALS chapter.

2.3. DESCRIPTION OF CONNECTION OF TERMINAL BOXES AND CRIMP CONNECTORS

- The wires must be connected so that their insulation is inserted in the terminal recess.

- When inserting the wires without the hollow pin connectors, make sure that all strands of the wire are inserted into the terminal.

- Always check the correct wire connection by pulling.

- Apart from the screw terminals, the following systems with flexible spring clamps are used:

Serial Phoenix terminal box with flexible push-in clamps:

- Usage: Terminal blocks - **X1, X2, X3, XU**.

- The clamp enables direct insertion of rigid wires and wires with hollow pin connectors without additional tools.

- When connecting the stranded wires without the hollow pin connector or disconnecting the wires, you can open the clamp by pressing the orange button with any tool as shown on the figure.
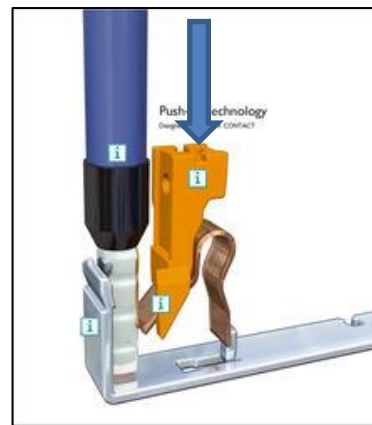
Weidmüller connector with flexible clamps:

- Usage: RS 485 **D1** Distributor

- The clamp is opened by inserting the 2.5x75 slot screwdriver into the lock as shown on the figure.

- The screwdriver must be used when connecting and disconnecting wires.
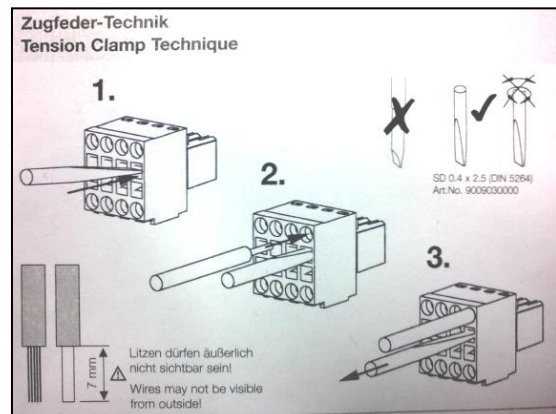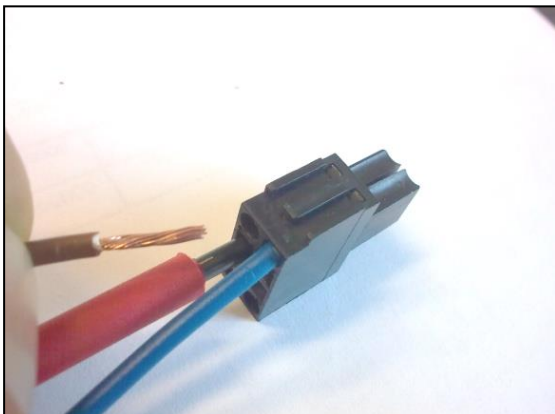
Weidmüller connector with flexible push-in clamps:

- Usage: **MDD168** drive**.**

- The clamp enables direct insertion of rigid wires and wires with hollow pin connectors without additional tools.

- When connecting the stranded wires without the hollow pin connector or disconnecting the wires, you can open the clamp by pressing the button with any tool according to the arrow on the figure.

Phoenix connector with flexible push-in clamps with lock:

- Usage: The MLU10 **electronics**, connector **K2, K3, K4**.

- The connector is also used to connect the Turnstile tester

- The clamp enables direct insertion of rigid wires and wires with hollow pin connectors without additional tools.

- When connecting the stranded wires without the hollow pin connector or disconnecting the wires, you can open the clamp by pressing the orange button with any tool as shown by the arrows on the figure

- The lock is automatically secured after inserting the connector into the electronics.

- After pressing the lock with a finger according to the arrows in the picture, the connector is automatically released.
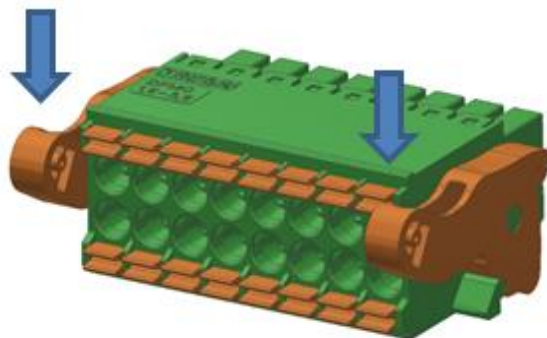
3. PUTTING THE TURNSTILE INTO OPERATION

3.1. CHECKING THE TURNSTILE BEFORE PUTTING IT INTO OPERATION

- Check that all wires are connected to the appropriate terminals according to the wiring diagram.

- Check that all screw terminals are properly tightened.

- With adequate pulling of the wires check the connection with a spring push-in connector.

3.2. INITIALIZATION OF THE TURNSTILE

Turnstile can only be put into operation by a COMINFO service department employee or worker, who possess the certificate of installation schooling from the COMINFO Company.

When putting the turnstile into operation, initialization of the turnstile takes place after connection of power supply. During the initialization, the turnstile wings slowly move to the stop ends in both directions and then stop in a closed position. It must not be interfered in any way with the turnstile during the initialization procedure.

Initialization occurs whenever the turnstile is connected to the power supply, or when it is lost and restored.

3.3. CHECKING THE ELECTRONICAL COMPONENTS AFTER INITIALIZATION

3.3.1. Checking the electronics signalization

All electronical components are equipped with optical signalization of operating states.
If everything is in order, electronical components must signal following state-

- SM12 **PS1, PS2** power supply
  - green power LED is on
- MLU10 **C1** control electronics
  - green power LED is on
  - orange LED RUN processor is blinking
- Supercapacitors **SC1, SC2**
  - green power LED is on
- Control electronics of optical signalization **CLU1, CLU2**
  - green power LED is on
  - green communication LED is on
- Sensor bars of the **TX1-TX4** transmitters
  - green synchronization LED is blinking
- Sensor bars of the **RX1-RX4** receivers
  - green power LED is on
- Signal expander **SE**
  - green communication LED is blinking

Note: Your turnstile may not be equipped with above mentioned features, based on the type of your turnstile and its optional accessories.

3.3.2. Checking the correct function of the optical sensors

The turnstile is capable of emergency operation even when individual sensors fail. Therefore, it is necessary to check the correct function of **all** optical sensors according to the following procedure:

- We perform the check after activating the EMERGENCY function based on the following principle.

  - When covering the two adjacent sensors, closing of the turnstile wings is blocked.

  - If only one sensor is covered, the turnstile wings are closing.

  - When the two sensors are covered again, the turnstile wings open again.

- Connect the *Turnstile Tester* according to the following chapter and activate the EMERGENCY function.

- Deactivate the EMERGENCY function and using the identification card consecutively cover the sensors according to the following picture.
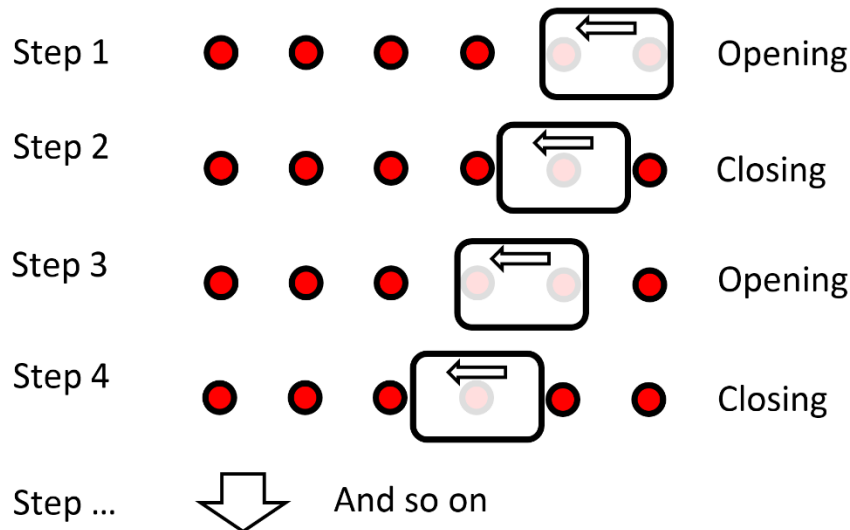
- When closing the wings, we have to cover the next pair of sensors before the wings reach the 45° angle.
  Otherwise the wings will close and we have to re-activate the EMERGENCY function.

- We perform the test consecutively on all four sensor bars.

When checking, it is possible to cover transmitter or receiver sensors.

When covering the sensors with the card, we must not cover any other sensor with our hand or other body part.

3.4. TESTING ALL THE TURNSTILE FUNCTIONS WITH THE TURNSTILE TESTER

- Before connecting the superior system, we verify all the turnstile functions using the *Turnstile Tester MLU10* control panel.

- The tester is connected directly into the MLU10 electronics.

- We disconnect the K3 connector from the electronics and connect the controller connector according to the following figure:
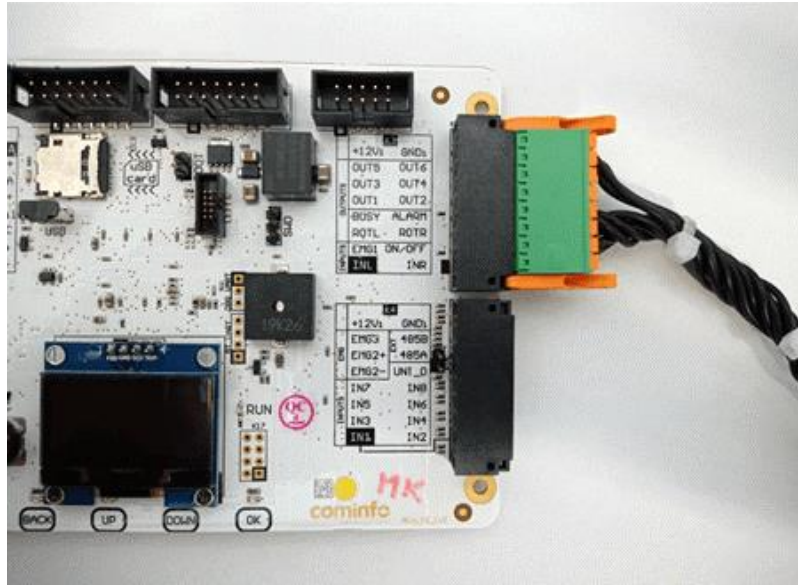
- Perform the test according to the chapter *DESCRIPTION OF CONTROLLING THE TURNSTILE BY STATUS SIGNALS.*

- Usage of the *Turnstile Tester* is described in a separate manual.

3.5. ADJUSTING THE TURNSTILE BEHAVIOR TO THE CUSTOMER'S REQUIREMENTS

- The turnstile is controlled by a separate MLU10 electronics which allows configuration and adjustment of the turnstile behavior to the customer's requirements.

- **These settings can be made only by a COMINFO service department employee or worker, who possess the certificate of installation schooling from the COMINFO Company.**

- The adjustment is done by reconfiguring the parameters using the TCONF application.

- **The most important parameters concern the level of security and safety.**

- **When the high level of security is set, there is a risk of injury when unauthorized passage is attempted.**

- **The turnstile operator must be provably informed of this fact and the manufacturer is not responsible for eventual injuries or property damages.**

- **We recommend to print out the parameters after the setting and have it signed by the customer. The customer is then responsible for any incidents.**

Adjustable parameters are described in detail in the *Instruction Manual***.**

4. DESCRIPTION OF THE TURNSTILE CONNECTION

4.1. CONNECTING THE INTERNAL POWER SUPPLIES

- The turnstile uses two types of switching mode power supplies made by the COMINFO company.

    o SM12 power supply – power supply with 12VDC output voltage

    o SM5 power supply – power supply with 5VDC output voltage

- The power supplies are powered from an internal or external **TT** transformer with 24VAC supply voltage.

- The output voltage of each gate's power supply is connected to the common GND potential.

- The GND potential must not be connected to GND potential of other gates.

- The GND potential must not be connected with the protective circuit, nor with the superior system potential.

- The power supplies are located according to the turnstile composition in the following way:
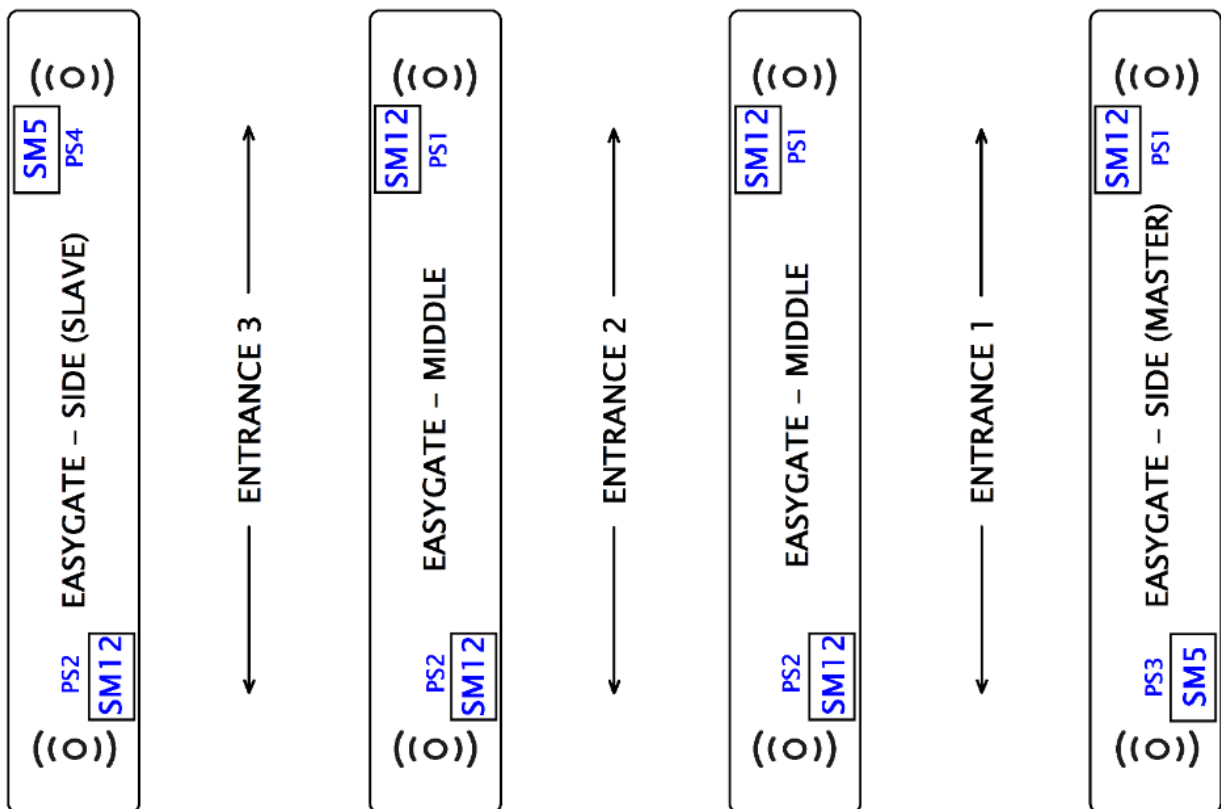
4.1.1. Power supplies in the SIDE MASTER turnstile

- **The PS1 - SM12 power supply is connected to the X2 terminal and supplies the devices of ENTRY1 gate:**
  o **C1** – MLU10 control electronics
  o **M1** – MDD168 master turnstile drive with brake **ZB1**
  o **CLU1** - master turnstile optical signalization electronics
  o **DLL1** – master turnstile Lane Light
- **The PS3 - SM5 power supply is connected to the X2 terminal and supplies the devices of ENTRY1 gate:**
  o **PL1** – inner Passage Light
  o **PL2** – outer Passage Light

4.1.2. Power supplies in the MIDDLE turnstile

- **The PS2 - SM12 power supply is connected to the X3 terminal and supplies the devices of ENTRY1 gate:**
  o **M2** – MDD168 slave turnstile drive with brake **ZB2**
  o **CLU2** - slave turnstile optical signalization electronics
  o **DLL2** – slave turnstile Lane Light
  Note: The ENTRY1 Passage Light of the MIDDLE turnstile is powered from the **CLU2** electronics.
- **The PS1 - SM12 power supply is connected to the X2 terminal and supplies the devices of ENTRY2 gate:**
  o **C1** – MLU10 control electronics
  o **M1** – MDD168 master turnstile drive with brake **ZB1**
  o **CLU1** - master turnstile optical signalization electronics
  o **DLL1** – master turnstile Lane Light
    Note: The ENTRY2 Passage Light of the MIDDLE turnstile is powered from the **CLU1** electronics.

4.1.3. Power supplies in the SIDE SLAVE turnstile

- **The PS2 - SM12 power supply is connected to the X3 terminal and supplies the devices of ENTRY2 gate:**
  o **M2** – MDD168 slave turnstile drive with brake **ZB2**
  o **CLU2** - slave turnstile optical signalization electronics
  o **DLL2** – slave turnstile Lane Light
- **The PS4 - SM5 power supply is connected to the X3 terminal and supplies:**
  o **PL1** – inner Passage Light
  o **PL2** – outer Passage Light

4.2. CONNECTING THE MLU10 CONTROL ELECTRONICS

4.2.1. Description of the MLU10 electronics

- The control electronics is designed for universal controlling of all COMINFO turnstiles.
- The MLU10 electronics follows-up on the previous version of the MLU5 electronics with the following differences:
  - o Service display for monitoring states and errors
  - o RJ45 connector for ETHERNET connection
  - o Direct connection of sensor bars without SBCB electronics
  - o Direct connection of the FIRE (EPS) signal without using the EMGI module
  - o Increasing the number of inputs and outputs (8 inputs, 8 outputs)
  - o Option to modify all inputs and outputs
  - o Implemented Wav Player
  - o SD card for saving and collecting data
  - o **Galvanically isolated power supply of inputs and outputs**

4.2.2. MLU10 connectors layout
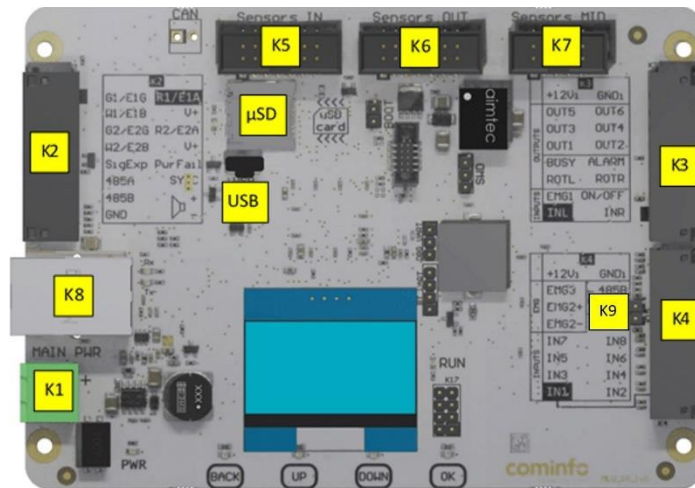
- K1 - 13.8VDC power supply connector
- K2 - internal circuits connector
- K3 - main connector of control signals
- K4 - extending connector of control signals
- K5 - Sensors IN connector for sensor bars
- K6 - Sensors OUT connector for sensor bars
- K7 - Sensors MID connector for sensor bars
- K8 - RJ45 – ETHERNET connector
- K9 - Jumper
- USB - service connector (only for purposes of the manufacturer - do not connect any devices)
- µSD - micro SD card slot

4.2.3. Description of connection of the MLU5 electronics connectors

- Only connectors necessary to control the EASYGATE SPT turnstile are connected to the electronics.
- No other connectors or wires can be connected to the electronics without consulting the manufacturer.
- Connecting the EASYGATE SPT signals according to markings on the PCB terminals of the MLU10 electronics

CONNECTOR	DESCRIPTION	CONNECTION

Connector K1

| MAIN PWR | 13.8VDC power supply | X2 terminal block |

Connector K2

RS485A DATA INT.	internal communication line channel A	485 D1 distributor
RS485B DATA INT.	internal communication line channel B	485 D1 distributor
SYNC	sensor synchronization signal	X2 terminal block
PwrFail	Loss of power supply signal	output O1 of the SM12 power supply
SP speaker symbol	direct connection of a speaker	8ohm speaker
V+	press sensor/backlight master +	PS1/BL1
G1/E1G	press sensor/backlight master -	PS1/BL1
R1/E1A	press sensor/backlight master sig.A	PS1/BL1
W1/E1B	press sensor/backlight master sig.B	PS1/BL1
V+	press sensor/backlight slave +	X2 terminal block
G2/E2G	press sensor/backlight slave -	X2 terminal block
R2/E2A	press sensor/backlight slave sig.A	X2 terminal block
W2/E2B	press sensor/backlight slave sig.B	X2 terminal block

Connector K3

+12Vi	isolated power supply of inputs and outputs	XU terminal block
GNDi	isolated power supply of inputs and outputs	XU terminal block
INL	preset input	XU terminal block
INR	preset input	XU terminal block
ON/OFF	preset input	XU terminal block
EMG1	preset input	XU terminal block
ROTL	preset output	XU terminal block
ROTR	preset output	XU terminal block
BUSY	preset output	XU terminal block
ALARM	preset output	XU terminal block
OUT1-OUT4	modifiable outputs	XU terminal block
OUT5-OUT6	extensional outputs (on request to manufacturer)	not connected

Connector K4

RS485A DATA EXT.	external communication line channel A	485 D1 distributor
RS485B DATA EXT.	external communication line channel B	485 D1 distributor
EMG2+/EMG2-	EMERGENCY voltage input	XU terminal block
EMG3	EMERGENCY specific input	not connected
IN1-IN4	modifiable inputs	XU terminal block
IN5-IN8	extensional inputs (on request to manufacturer)	not connected
UNI-0	input for manufacturer's needs only	XU terminal block

Connector K5

| Sensors IN | Entry side sensor bars | RX2 sensor bar |

Connector K6

| Sensors OUT | Exit side sensor bars | RX4 sensor bar |

Connector K7

| Sensors MID | not used with EASYGATE SPT | not connected |

Connector K8

| RJ connector | connector for ETHERNET connection | available for connection |

4.3.   CONNECTING THE INPUT CONTROL SIGNALS

- **The +12Vi and GNDi terminals are used EXCLUSIVELY for activation of inputs/outputs.**

- **The GNDiz potential must not be in any case connected to the GND potential of the turnstile power supply.**

4.3.1.   Connection by switching the contact without external potential

- The inputs are activated by applying the GNDi potential.

- The GROUP parameter in TCONF application must be set to GND (factory setting).

Example of connecting the INL control signal by switching the contact without external potential.
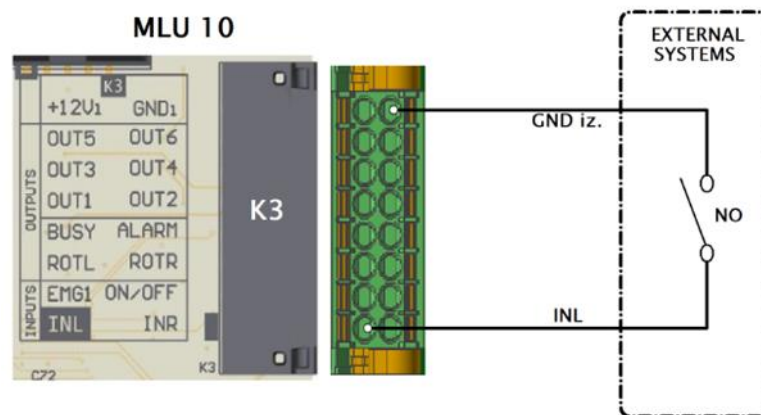
4.3.2.   Connection by switching the contact with external potential

- The inputs are activated by applying the external potential with voltage up to +13.8VDC.

- The GROUP parameter in TCONF application must be set to +12V.

- We recommend consulting the connection with external potential with the manufacturer COMINFO.

Example of connecting the INL control signal by applying the +12V external potential.
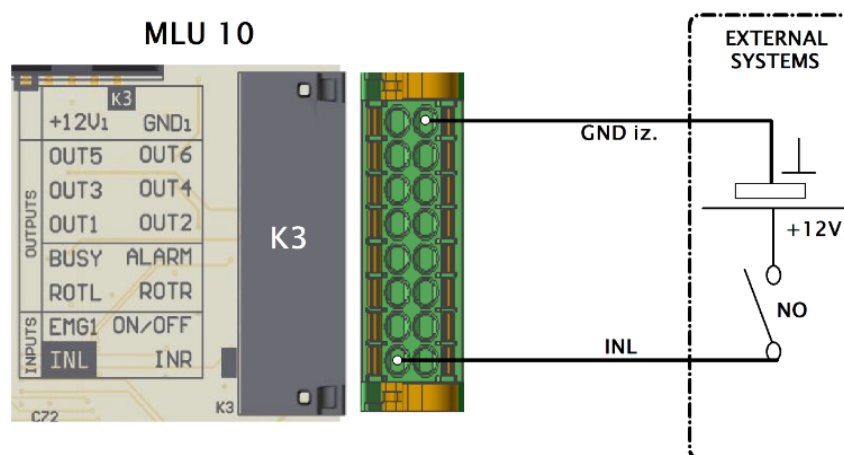
4.4. CONNECTING THE OUTPUT CONTROL SIGNALS

- **The +12Vi and GNDi terminals are used EXCLUSIVELY for activation of inputs/outputs.**

4.4.1. Connection in the output contact mode - standard

- It is necessary to connect the GND of the superior system with GNDiz potential for correct function.

Example of connecting the BUSY output control signal in the output contact mode.
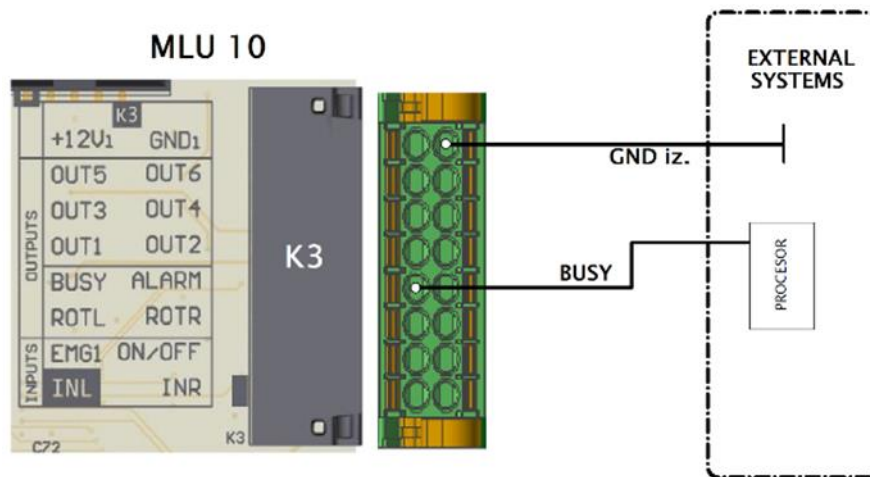
4.4.2. Connection in the 12VDC output potential mode

- This connection can be used with superior system with individual positive and negative terminal (optron).

- We recommend consulting the connection in the output potential mode with the manufacturer COMINFO.

Example of connecting the BUSY output control signal in the 12VDC output potential mode.

4.5.   CONNECTION FOR CONTROLING WITH SUPERIOR SYSTEM
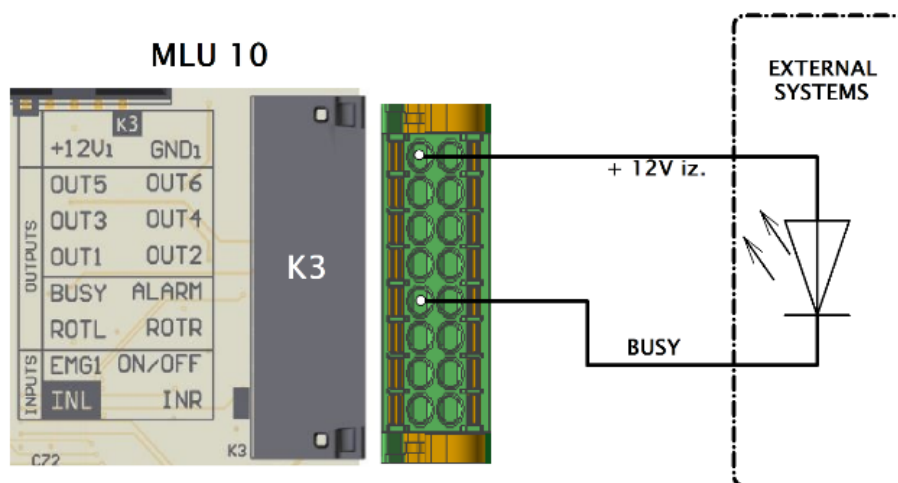
Standard connection diagram for controlling with superior system
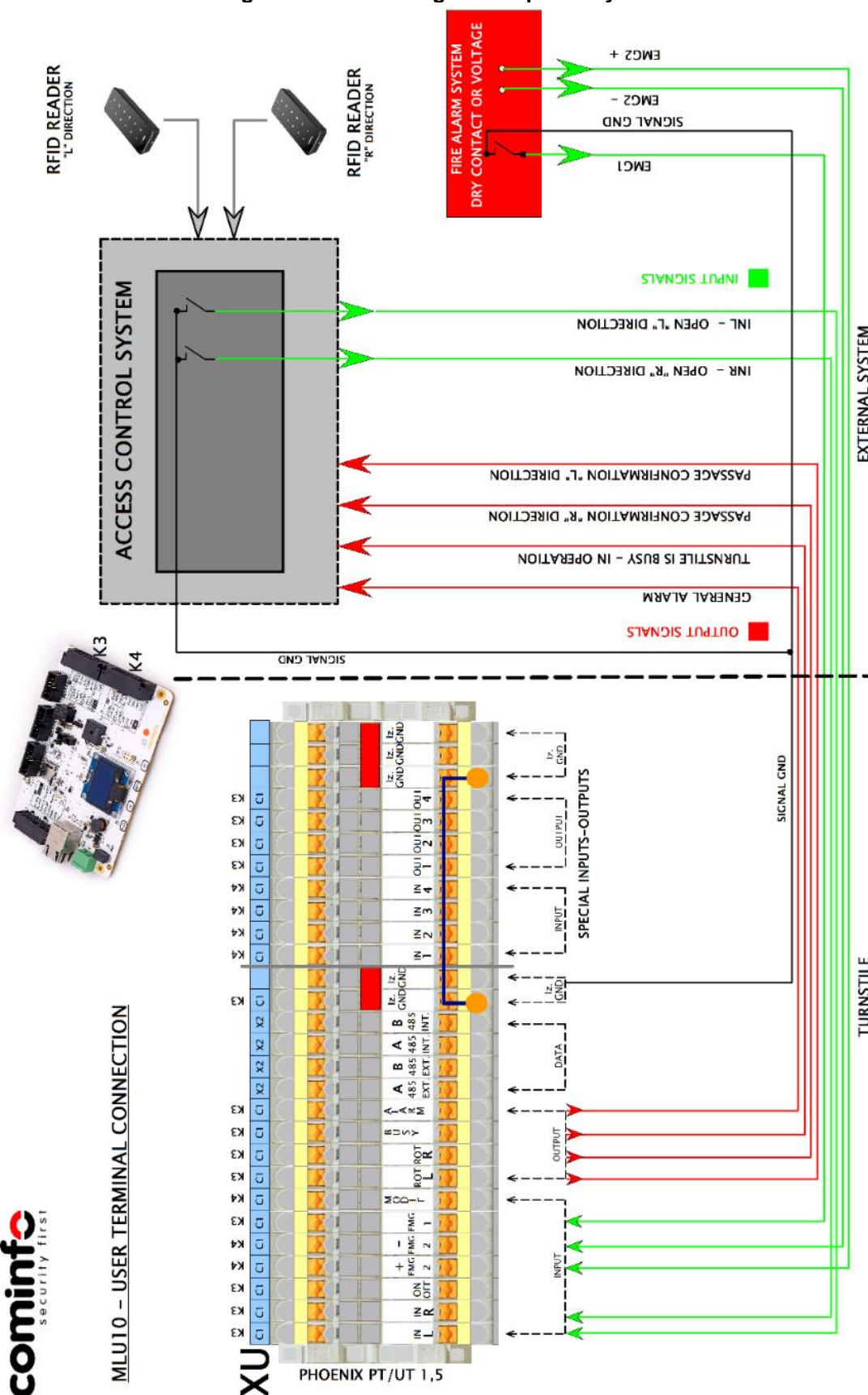
4.6. CONNECTION FOR CONTROLLING EMERGENCY (FIRE, EPS)

4.6.1. Connection for EMERGENCY activation by the superior system

- It concerns a connection of the superior signal FIRE (EPS) of the fire alarm system, which processes signals from safety devices (fire detectors, etc.).

- The turnstile enables connection of all generally used signals of the FIRE(EPS) systems:

    o FIRE (EPS) signal - NO type contact, potential-free
    o FIRE (EPS) signal - NC type contact, potential-free
    o FIRE (EPS) signal - NO type contact, 24VDC potential
    o FIRE (EPS) signal - NC type contact, 24VDC potential

- The potential-free signal (EPS system relay) is connected to the **GNDiz** and **EMG1** terminals.

- The powered signal is connected to the **EMG2+** and **EMG2-** terminals.

- The NO/NC type contact is set in T-CONF application by setting the Emergency INPUT parameter to EMG1-NO or EMG1-NC.

NO type contact, potential-free
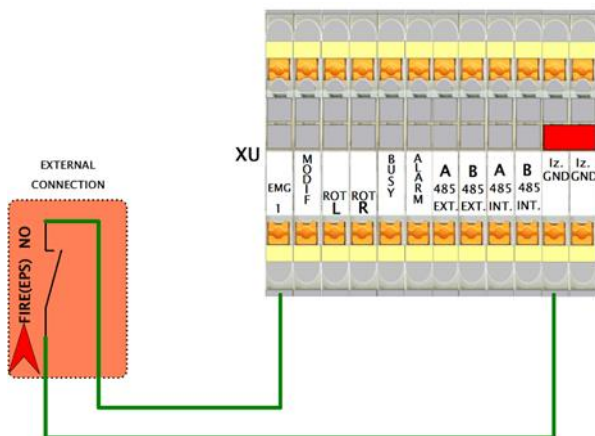
NC type contact, potential-free
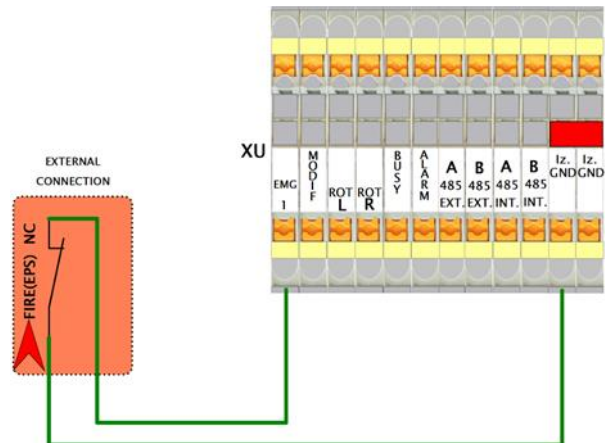
NO type contact, 24VDC potential
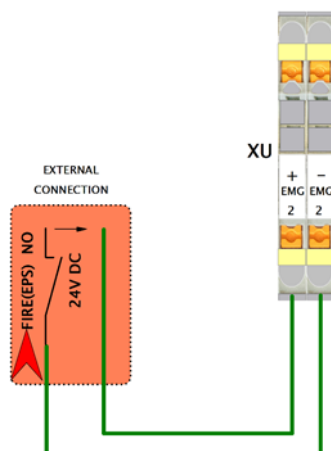
NC type contact, 24VDC potential
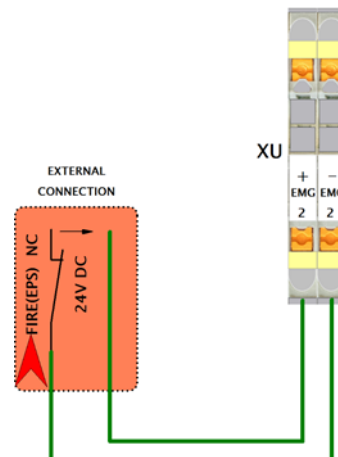
4.6.2. Connection for activation of the EMERGENCY in case of loss of power voltage

CONNECTION WITH A COMINFO SM12 BACKUP POWER SUPPLY:

- For this function, supercapacitors must be connected to the power supplies of PS1 master and PS2 slave turnstiles.

- The SM12 backup power supply has a supply voltage loss output signal.

- Only the output signal of the PS1 master turnstile power supply is used to control the EMERGENCY activation.

- The O1 output of the PS1 power supply is connected with the PwrFail terminal on the MLU10 electronics.

Wiring diagram
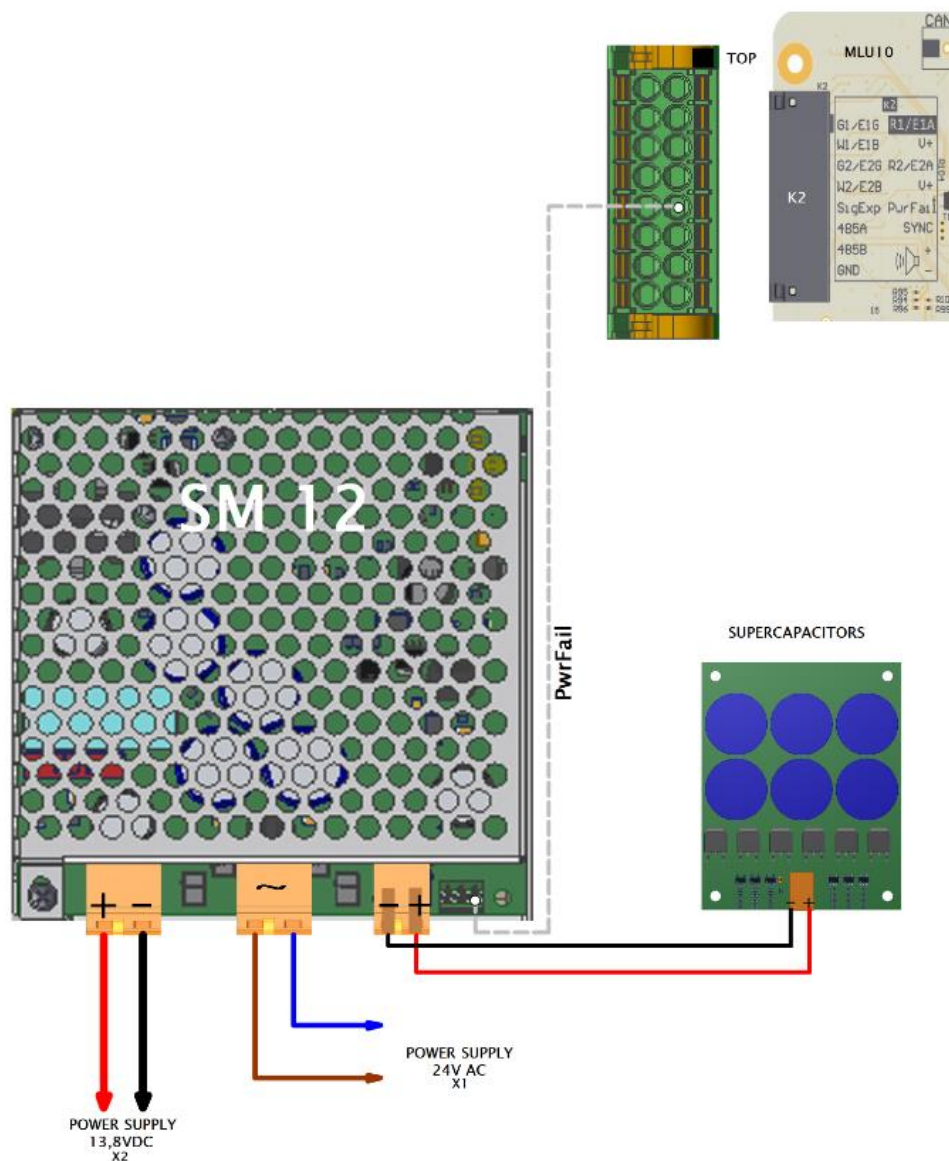
CONNECTION WITH BACKUP POWER SUPPLIES BY A THIRD-PARTY MANUFACTURERS:

- Connection with third-party power supplies is only possible after consultation with the COMINFO Technical Support.

4.7. CONNECTING THE DRIVE UNITS AND BRAKES

4.7.1. Description of controlling the drive units

- The **MDD168** drive units have their own electronics powered by the **SM12** power supply.

- The MDD168 drive unit electronics are subordinate to the **MLU10** control electronics of the turnstile.

- Controlling is done through the internal communication line RS 485 DATA INT.

- The drive unit electronics performs following functions:

  - o Controls the electronic commutation of the motor.
  - o Switches the external electromagnetic tooth brake.
  - o Sends the information about status and position of the turnstile wings to the MLU10 electronics.

Note:
The drive unit of the turnstile with **MLU10** electronics is not equipped with an electromagnetic friction brake.
In case the **Push Through** function is used, the braking is ensured by the motor countercurrent.

4.7.2. Connecting the M1 MASTER drive unit

- The drive unit is connected via a 16-pole connector.

- The power supply from **PS1** is connected via the **X2** terminal in the master turnstile.

- The communication line RS485 DATA INT is connected to the **MLU10** electronics via the **X2** terminal and **D1** distributor.

- The electromagnetic tooth brake is connected directly in the drive unit connector.

4.7.3. Connecting the M2 SLAVE drive unit

- The drive unit is connected via a 16-pole connector.
- The power supply from **PS2** is connected via the **X3** terminal in the slave turnstile.
- The communication line RS485 DATA INT is connected to the MLU10 electronics via the **X3** terminal in the slave turnstile, **X2** in the master turnstile and **D1** distributor.
- The electromagnetic tooth brake is connected directly in the drive unit connector.
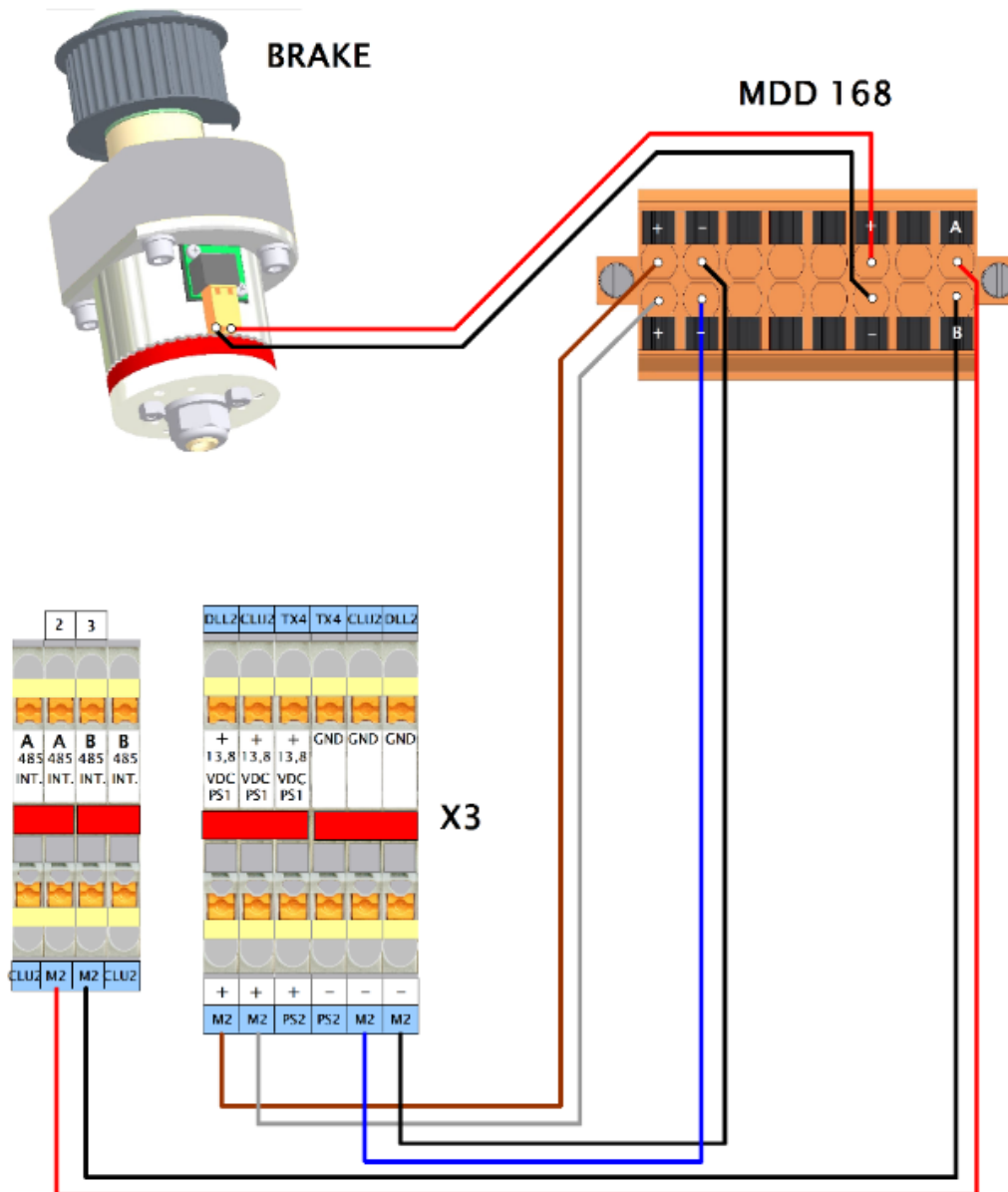
4.8. CONNECTING THE OPTICAL SENSORS

4.8.1. Description of the optical sensors

- Optical sensors are used to detect passages of persons through the turnstile.

- The turnstile is equipped with the optical sensors that are based on one-way light barrier principle (transmitter – receiver).

- The sensors use MULTIPLEX principle which is controlled by the **MLU10** electronics.

- Synchronization of the transmitters is ensured by the synchronization signal.

- The sensors are placed in the sensor bars of the **TX** transmitters and sensor bars of the **RX** receivers.

- Each sensor bar is fitted with nine sensors.

- The **TX** transmitter sensor bars are located in the SLAVE turnstile.

- The **RX** receiver sensor bars are located in the MASTER turnstile.

- The MIDDLE turnstile has the transmitter sensor bars on one side and the receiver sensor bars on the other side.

4.8.2. Layout of the optical sensors
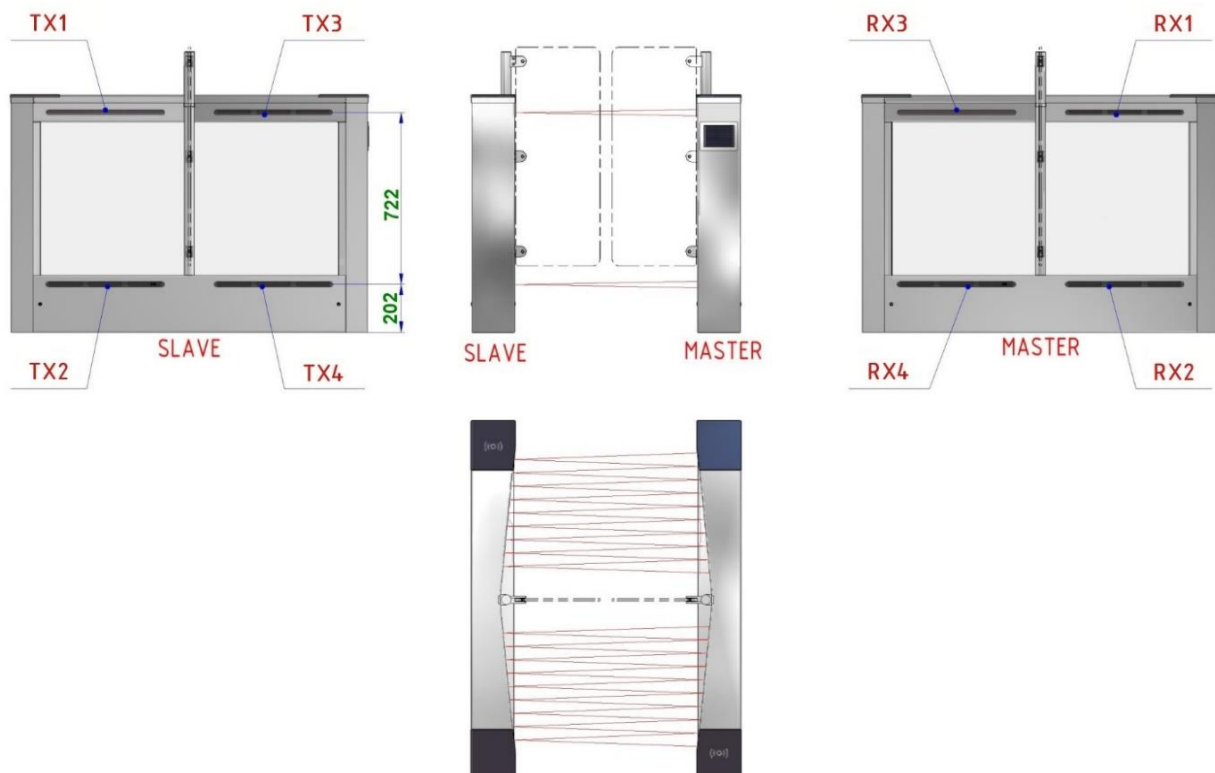
4.8.3.   Connecting the TX transmitter sensor bars

- The **TX** transmitter bars are interconnected by a three-wire cable and connected to the **X3** terminal.

- They are powered by a 13.8VDC **PS2** power supply of the SLAVE turnstile.

- The MLU10 synchronization signal is connected by the interconnecting cable through the **X2** terminal of the SLAVE turnstile and **X1** of the MASTER turnstile.

4.8.4.   Connecting the RX receiver sensor bars

- The **RX** receiver bars are interconnected by a flat cable and connected to the MLU10 electronics connectors.

- The ENTRY bars are connected to the SENSORS IN connector, the EXIT bars to the SENSORS OUT connector.
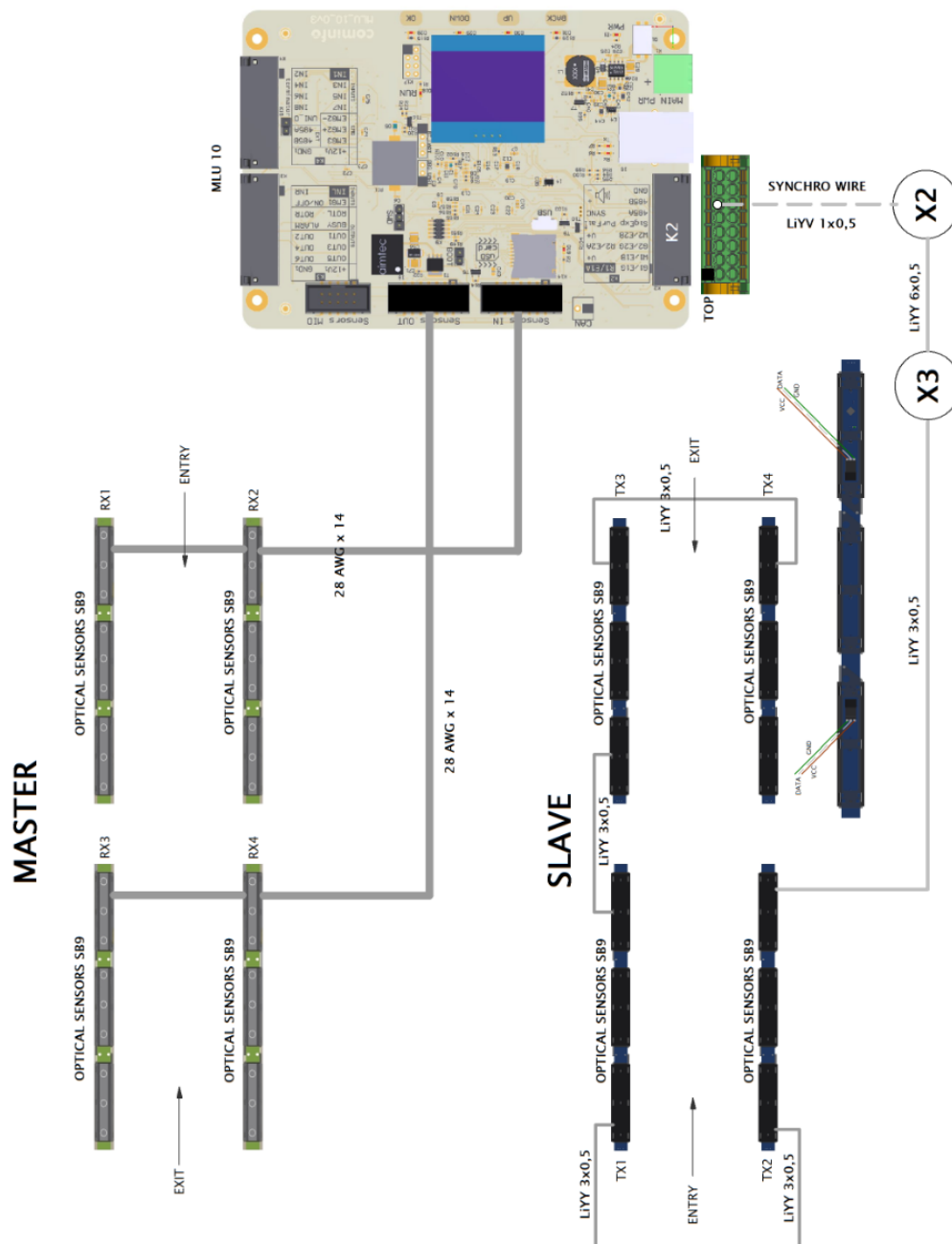
4.9. CONNECTING THE PRESSURE SENSORS (SENSORS FOR CLIMBING OVER)

4.9.1. Description of the pressure sensors

- The sensors work on a path sensing principle - they measure the deflection of the top cover while climbing over the turnstile.

- The sensors in the turnstiles are located and connected to the MLU10 electronics as shown on the following figures:
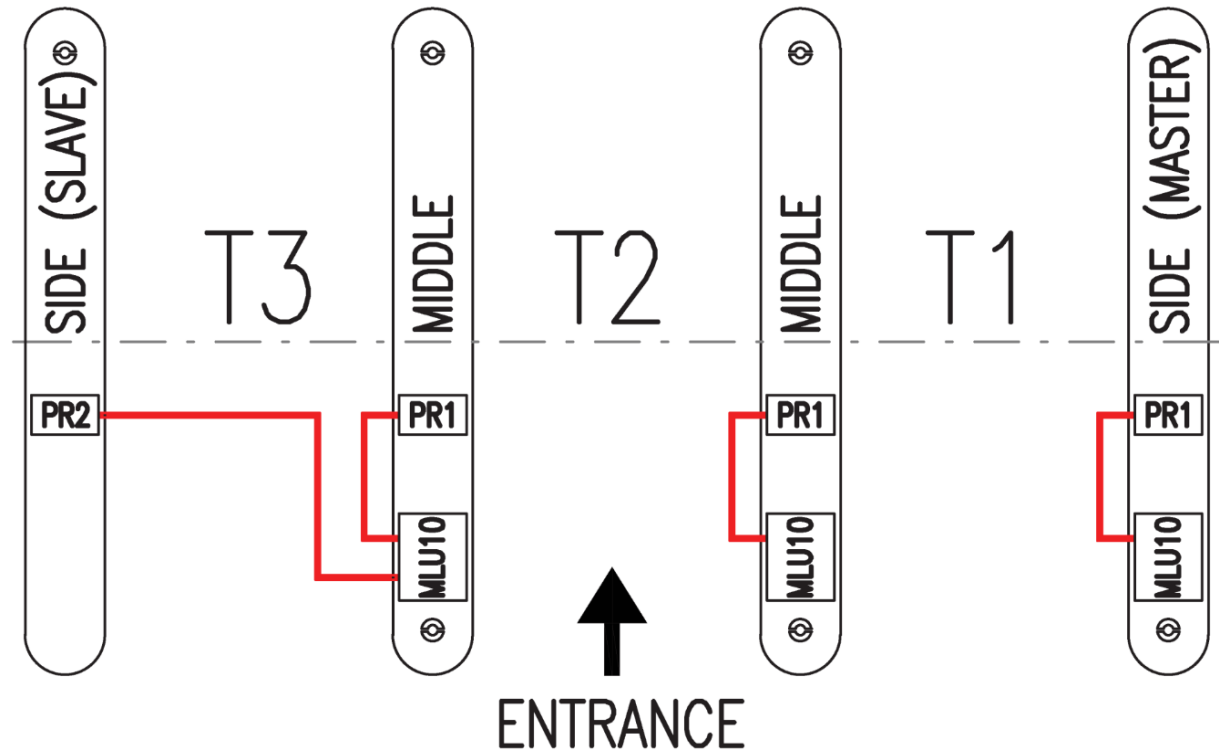
4.9.2. Connecting the pressure sensors

The **PRE1** sensor in the SIDE MASTER turnstile and in MIDDLE turnstiles is connected directly in the **K2** connector on the **MLU10** electronics located in the turnstile.
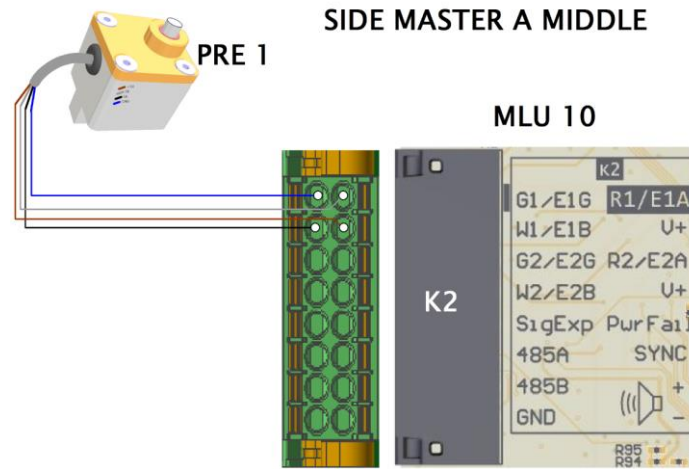
- The **PRE2** sensor in the SIDE SLAVE turnstile is connected through the **X2** and **X3** terminal to the **K2** connector on the control electronics located in an adjacent SIDE MASTER or MIDDLE turnstile.
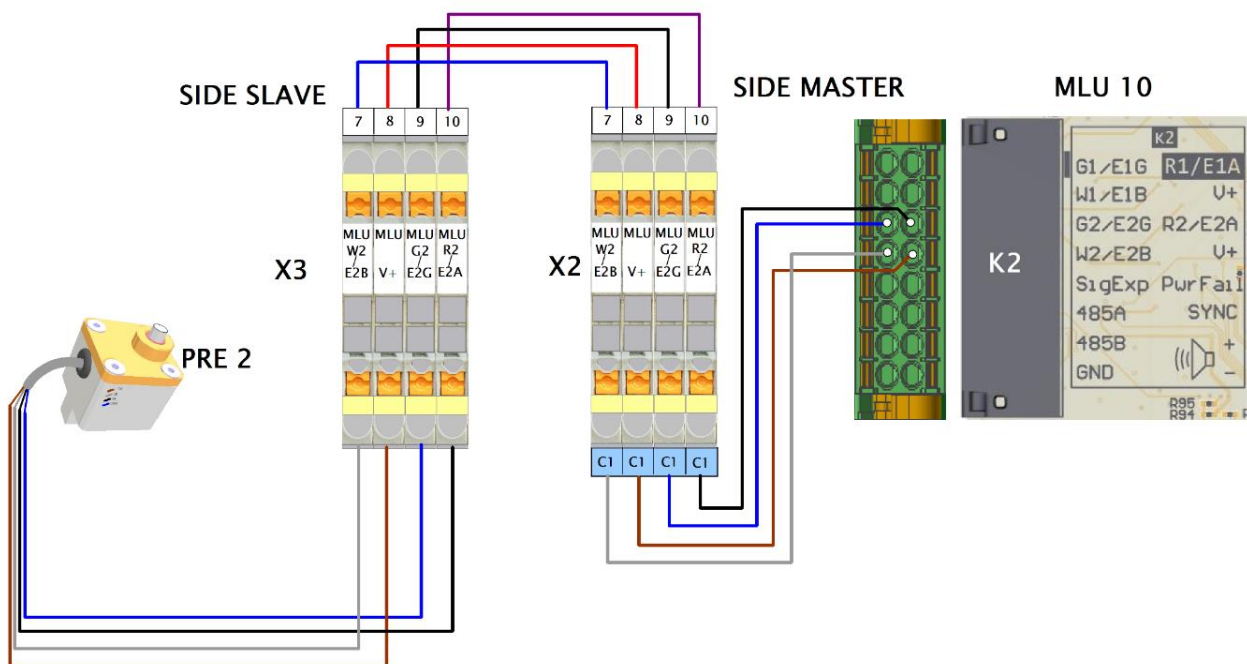
4.10. CONNECTING THE CLU – CABINET LIGHT UNIT

- The **CLU** electronics is subordinate to the **MLU10** electronics and serves for connecting and controlling the optical signalization.

- Each turnstile gate is equipped with the **CLU1** Master and **CLU2** Slave electronics.

- The **CLU1** Master electronics is powered from the master turnstile **PS1** power supply through the **X2** terminal.

- The RS485 internal communication line of the **CLU1** Master electronics is connected through the **X2** terminal.

- The **CLU2** Slave electronics is powered from the slave turnstile **PS2** power supply through the **X3** terminal.

- The RS485 internal communication line of the **CLU2** Slave electronics is connected through the **X3** terminal.

- Connecting the **CLU1/CLU2** electronics to the **X2/X3** terminal is identical to the following figure.
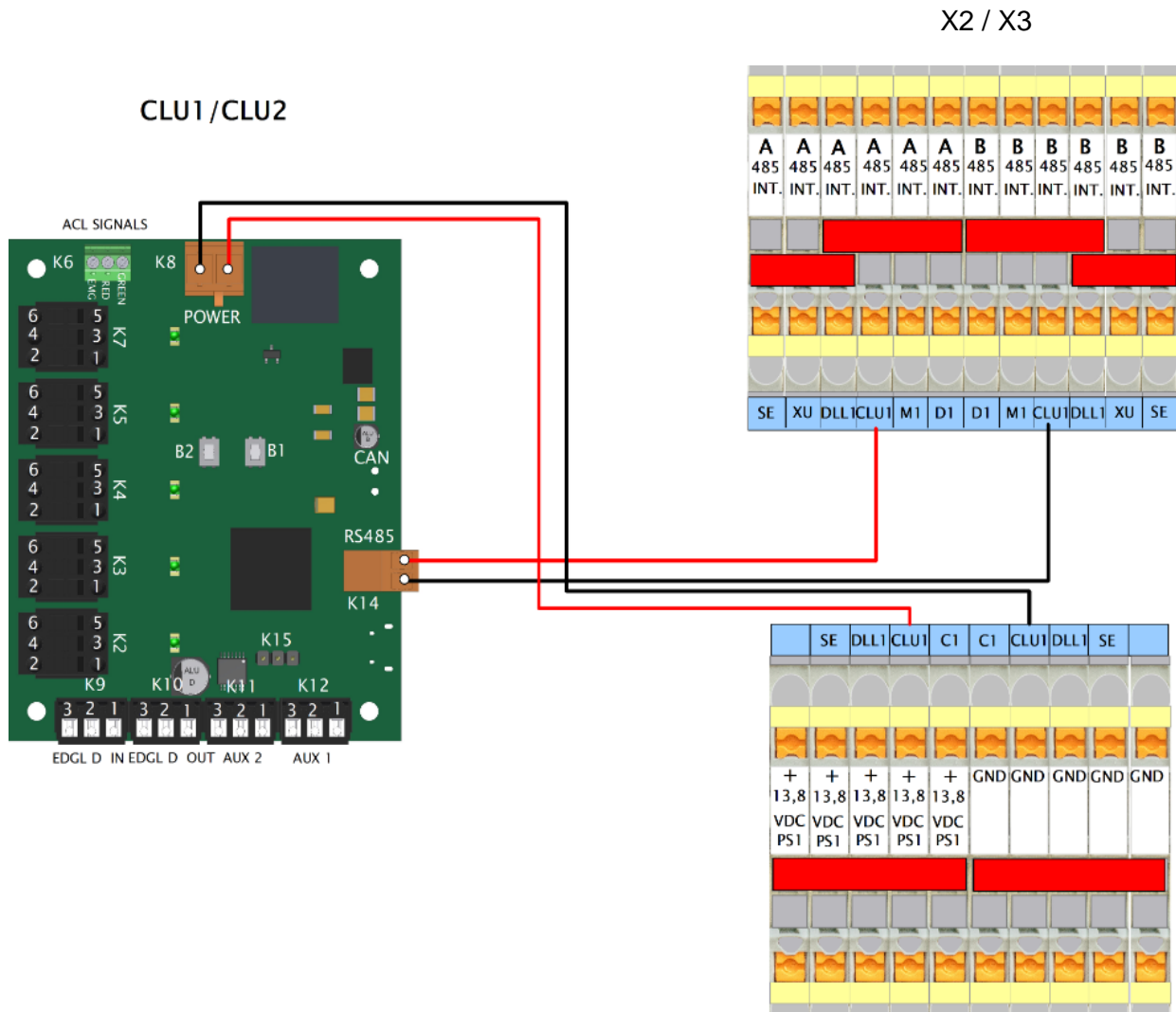
- Individual signaling devices are connected through the connectors located according to the following figure.
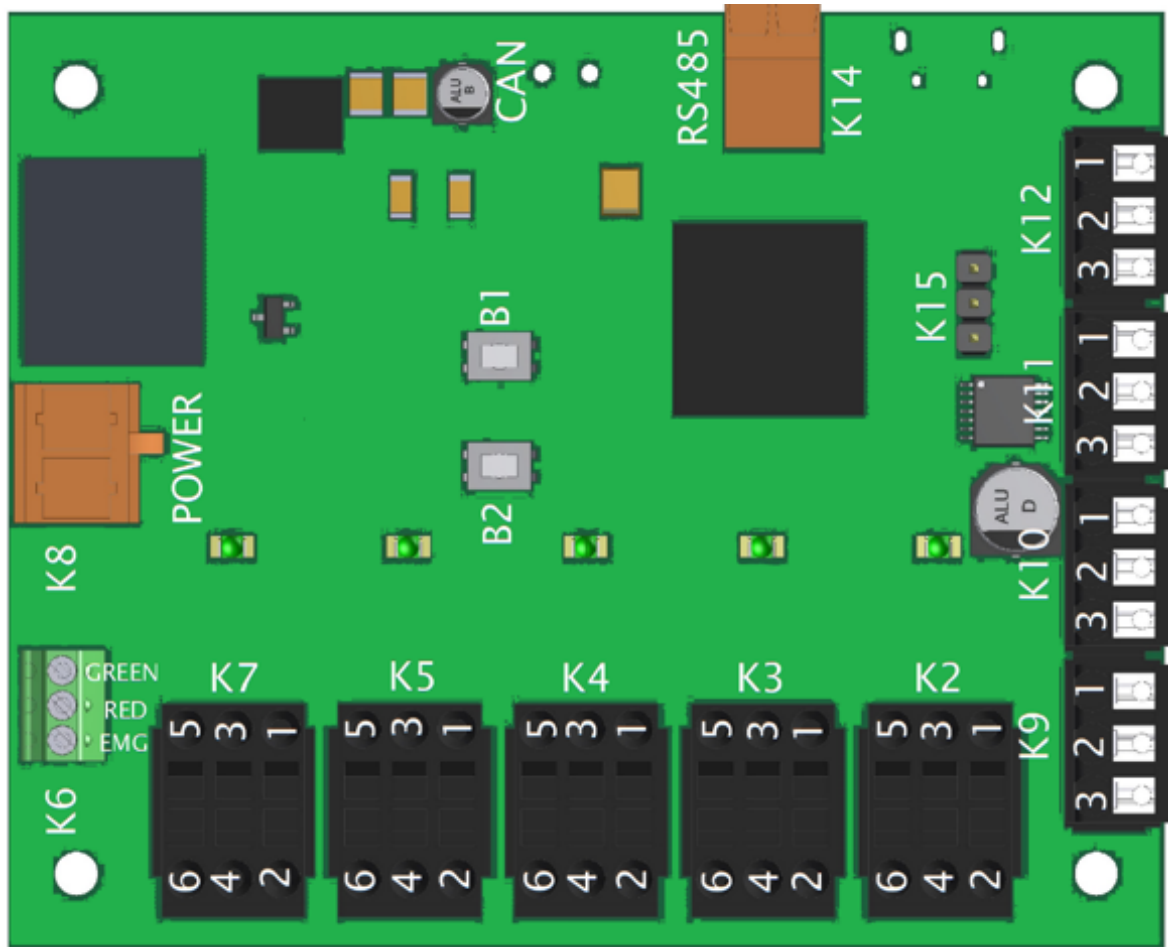
- Connection of individual signaling devices:

    o   K2 – WL1/WL2 Wing Light MASTER and SLAVE turnstile

    o   K3 – BL1/BL2 Back Light MASTER and SLAVE turnstile

    o   K9 – EL1/EL3 Entry Edge Light MASTER and SLAVE turnstile

    o   K10 – EL2/EL4 Exit Edge Light MASTER and SLAVE turnstile

    o   K11 – PL1/PL3 inner Passage Light

    o   K12 – PL2/P2L4 outer Passage Light

- There are separate instructions for use of the CLU *(Cabinet Light Unit)* electronics

4.11. CONNECTING THE BACK LIGHT

- The Back Light are always located on the right side of the entrance and exit corridor.

- By default, the Back Light are connected to the **CLU** electronics located in the turnstile cabinet.

- If the turnstile is equipped only with optical Backlight signalization, the entry and exit Back Light is connected to the **MLU10** electronics located in the MASTER turnstile.

4.11.1. Connecting the Back Light to the CLU electronics

- The entry Back Light **BL1** in the MASTER turnstile is connected using a cable connector to the **K3** connector on the **CLU1** optical signalization electronics located in the MASTER turnstile.

- The exit Back Light **BL2** in the SLAVE turnstile is connected using a cable connector to the **K3** connector on the **CLU2** optical signalization electronics located in the SLAVE turnstile.

- Connecting the **BL1/BL2** connectors to the **CLU1/CLU2** optical signalization electronics is identical to the following figure.
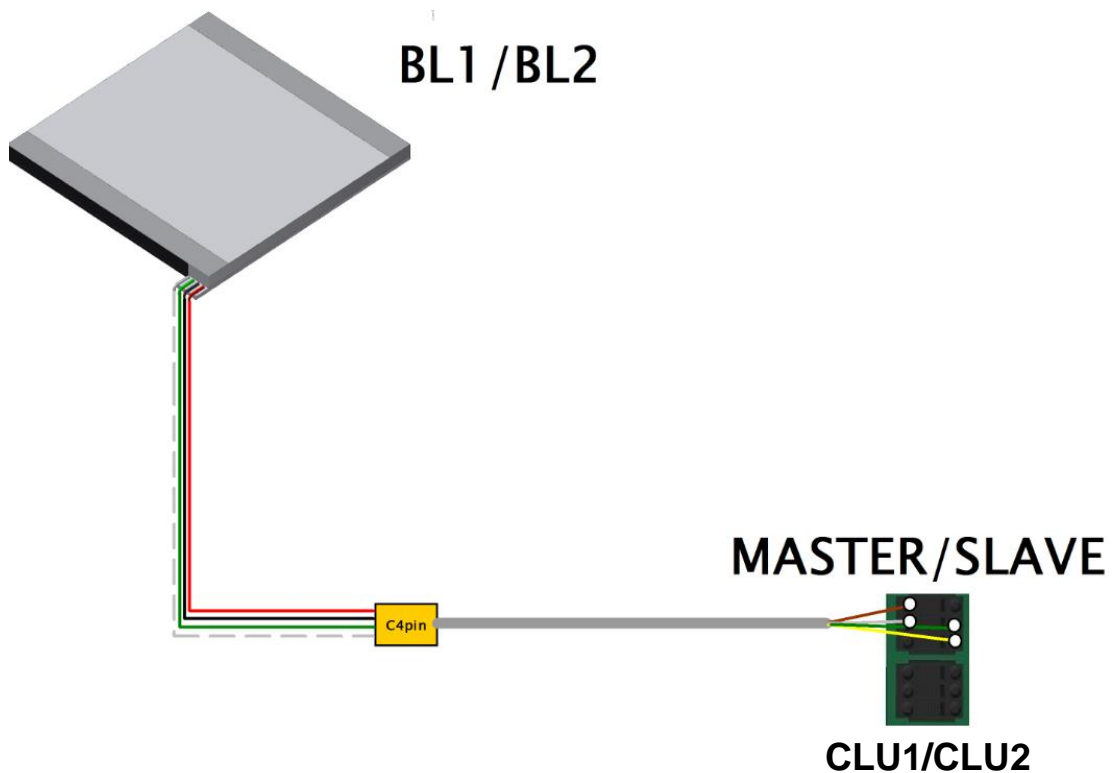
4.11.2. Connecting the Back Light to the MLU10 electronics

- The entry Back Light **B1** in the MASTER turnstile is connected using a cable connector to the **K2** connector on the **MLU10** control electronics located in the MASTER turnstile.
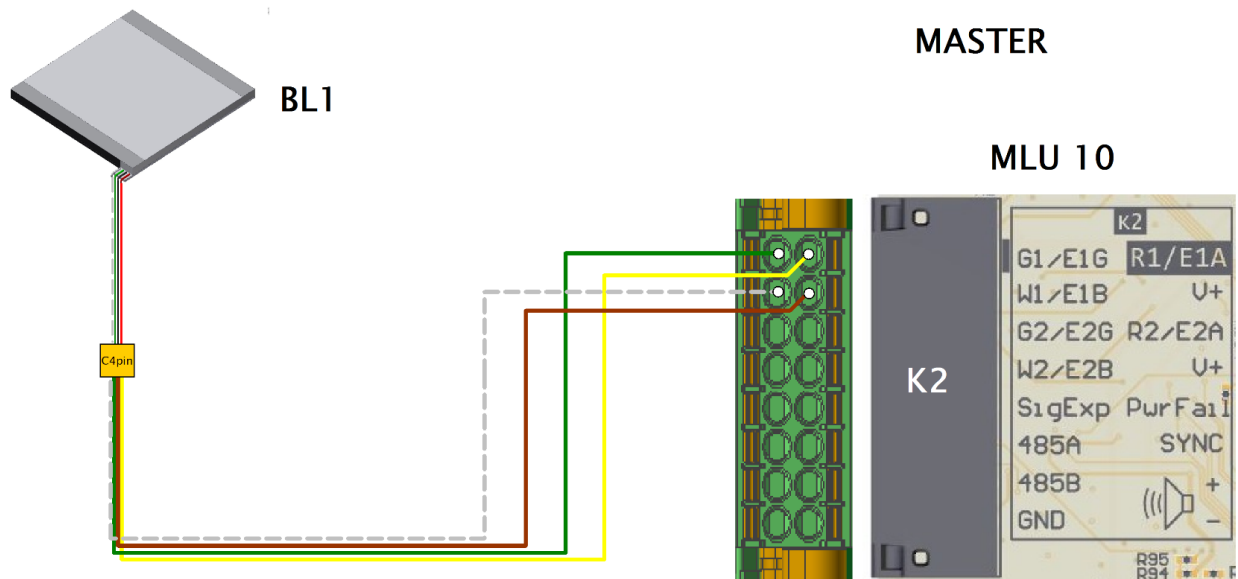
- The exit Back Light **B2** in the SLAVE turnstile is connected using a cable connector through the **X3** and **X2** terminals to the **K2** connector on the **MLU10** control electronics located in the MASTER turnstile.
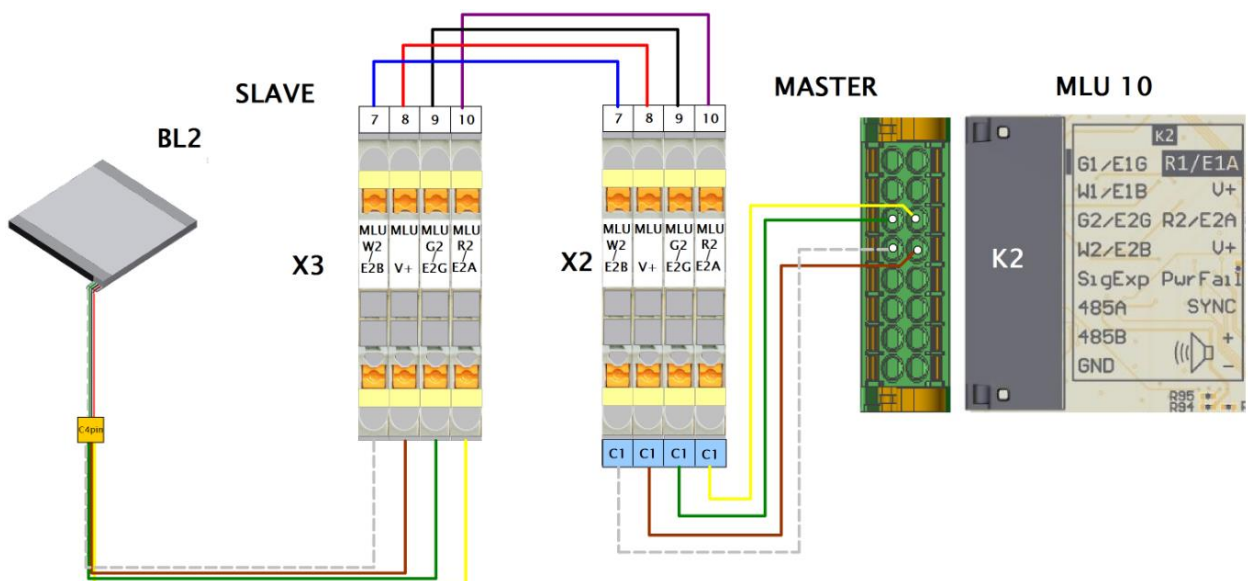
4.12. CONNECTING THE DIGITAL LANE LIGHT

- The Digital Lane Light are always located on the right side of the entrance and exit corridor.

- The entry Lane Light **DLL1** in the MASTER turnstile is connected to the **X2** terminal located in the MASTER turnstile.

- The exit Lane Light **DLL2** in the SLAVE turnstile is connected to the **X3** terminal located in the SLAVE turnstile.

- Connection of the **DLL1** to the **X2** terminal is shown on the figure below.

- Connection of the **DLL2** to the **X3** terminal is identical.

EASYGATE-SPT-SPD_MLU10_InstructionForInstallationElectro_EN_v101_20211018.docx
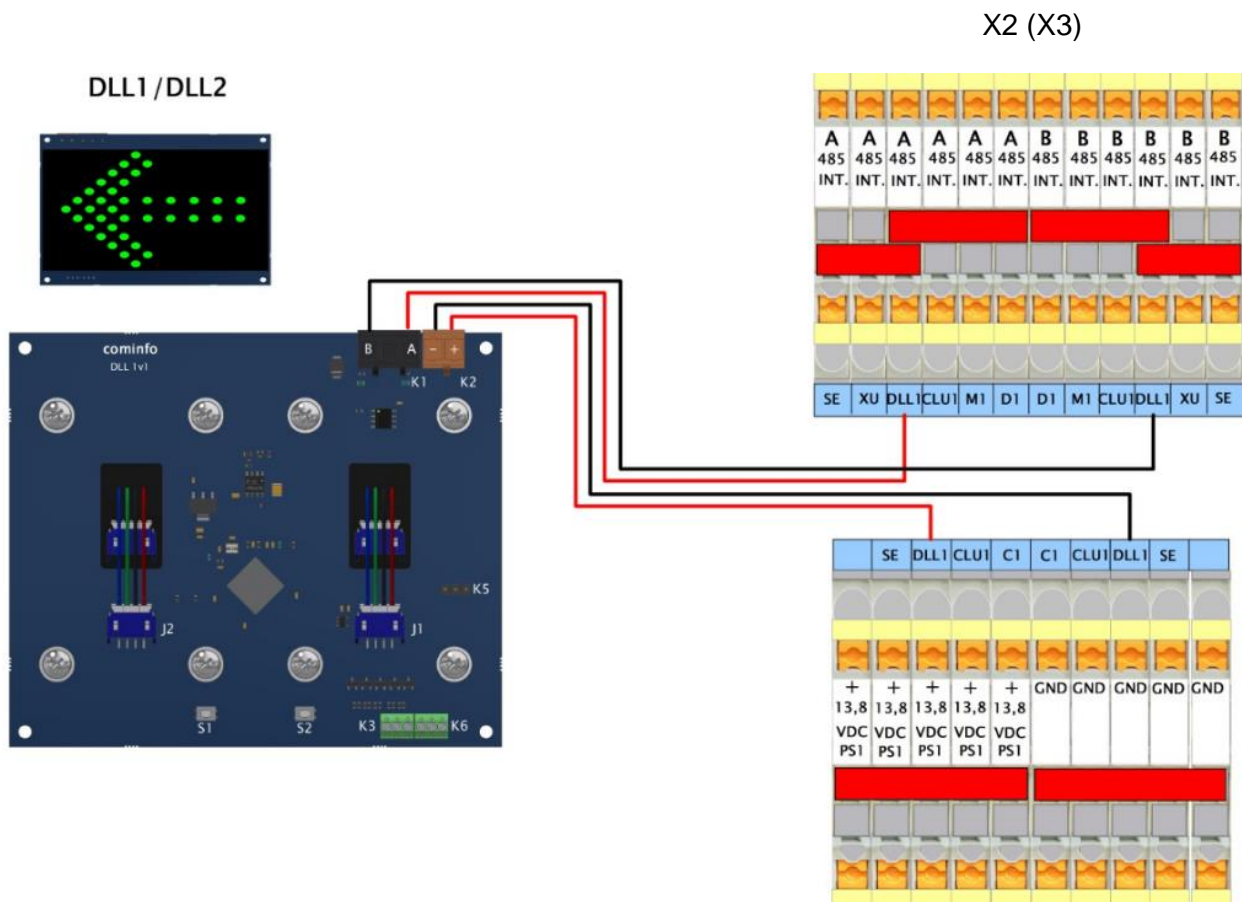
4.13. CONNECTING THE EDGE LIGHT

- The horseshoe shaped Edge Light are located in all corners of the turnstile.

- The Back Light are connected to the **CLU** electronics that are located in the same turnstile cabinet.

- The Edge Light is divided in two halves.

- In the SIDE turnstiles, both halves are wired in parallel and connected to a single **CLU** electronics.

- In the MIDDLE turnstiles, each half is connected to the **CLU** electronics located in the corresponding side of the gate.

4.13.1. Connecting the EDGE LIGHT in the SIDE MASTER turnstile

- The entry Edge Light **EL1** in the SIDE MASTER turnstile is connected using a cable connector to the **K9** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.

- The exit Edge Light **EL2** in the SIDE MASTER turnstile is connected using a cable connector to the **K10** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.
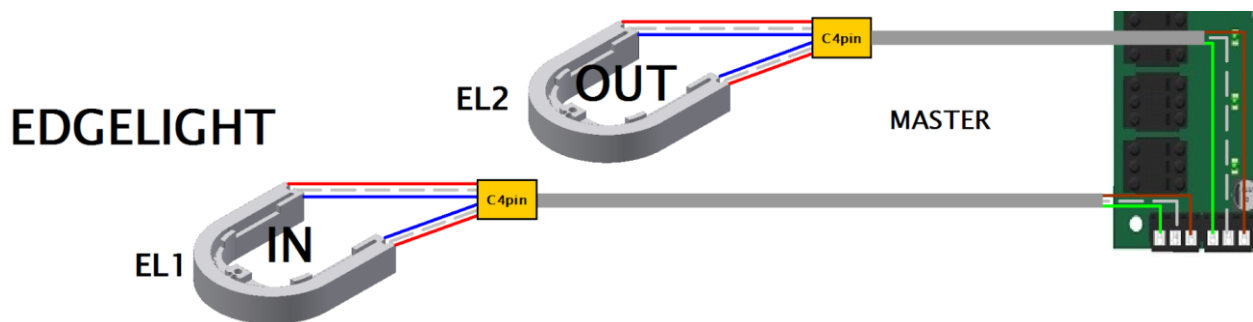
4.13.2. Connecting the EDGE LIGHT in the SIDE SLAVE turnstile

- The entry Edge Light **EL3** in the SIDE SLAVE turnstile is connected using a cable connector to the **K9** connector on the **CLU2** optical signalization electronics located in the SIDE SLAVE turnstile.

- The exit Edge Light **EL4** in the SIDE SLAVE turnstile is connected using a cable connector to the **K10** connector on the **CLU2** optical signalization electronics located in the SIDE SLAVE turnstile.
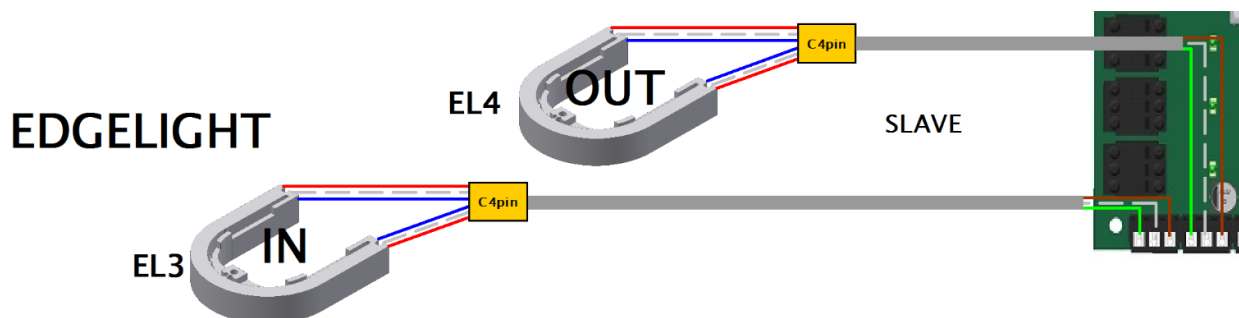
4.13.3. Connecting the EDGE LIGHT in the MIDDLE turnstile

- The entry Edge Light **EL1** on the MASTER side of the turnstile is connected using a cable connector to the **K9** connector on the **CLU1** optical signalization electronics located in the MASTER side of the turnstile.

- The exit Edge Light **EL2** on the MASTER side of the turnstile is connected using a cable connector to the **K10** connector on the **CLU1** optical signalization electronics located in the MASTER side of the turnstile.

- The entry Edge Light **EL3** on the SLAVE side of the turnstile is connected using a cable connector to the **K9** connector on the **CLU2** optical signalization electronics located in the SLAVE side of the turnstile.

- The exit Edge Light **EL4** on the SLAVE side of the turnstile is connected using a cable connector to the **K10** connector on the **CLU2** optical signalization electronics located in the SLAVE side of the turnstile.
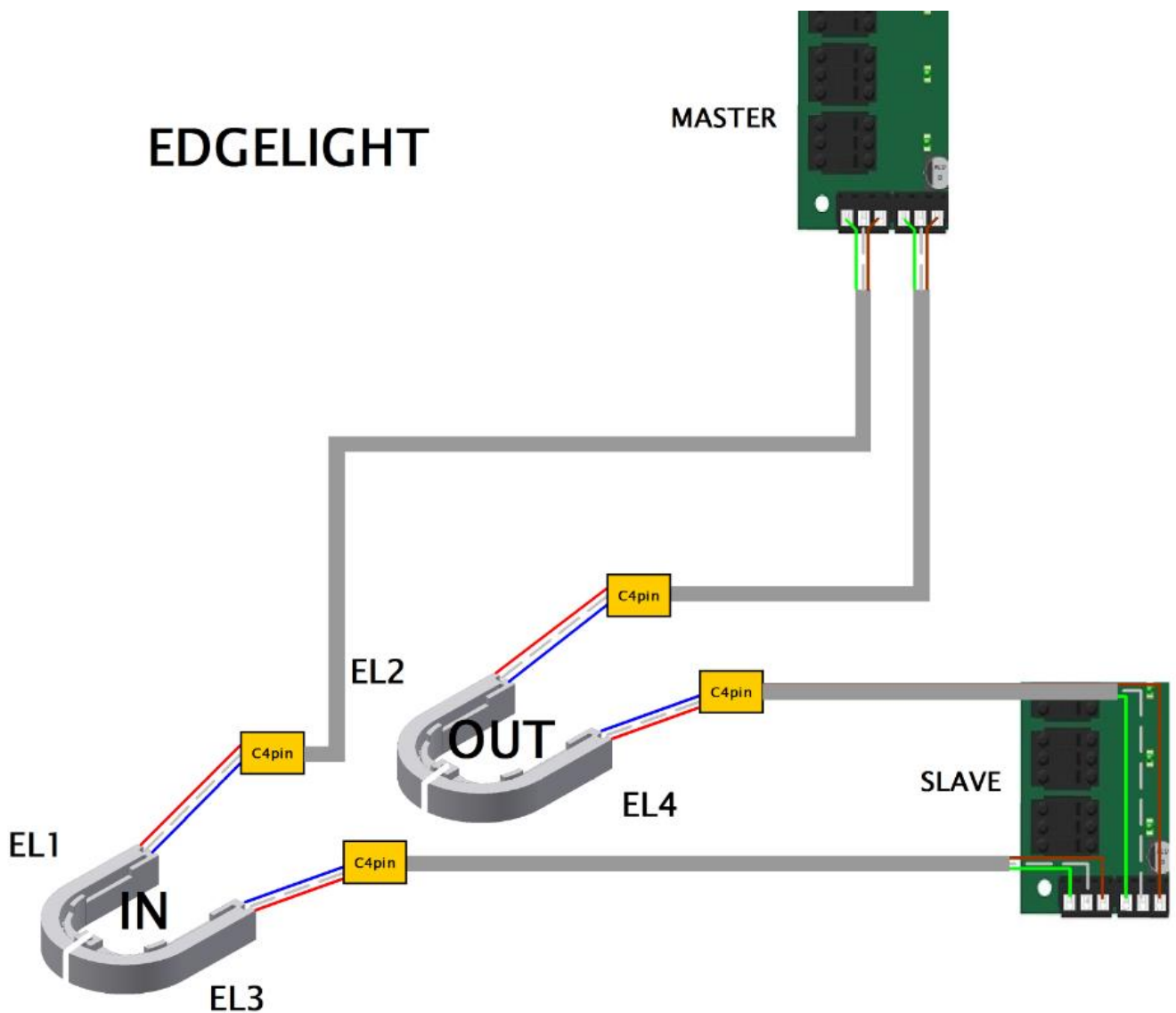
4.14. CONNECTING THE PASSAGE LIGHT

- The Passage Light consists of digital LED strips located around the entire perimeter of the top cover of the turnstile.

- Connection of the Passage Light is divided in two separate halves.

- The power supply is routed from both ends of the Passage Light due to voltage drop.

- Passage Light of the SIDE MASTER and SIDE SLAVE turnstile are powered from the SM5 power supplies located in the same turnstile cabinet.

- Passage Light of the MIDDLE turnstile are powered directly from the corresponding **CLU** electronics.

- The control signals lead from one end of the Passage Light and are connected to the corresponding **CLU** electronics located in the same turnstile cabinet.

4.14.1. Connecting the PASSAGE LIGHT in the SIDE MASTER turnstile

- The power supply of the inner Passage Light **PL1** in the SIDE MASTER turnstile is connected from both sides using cable connectors and connected to the **X2** terminal located in the SIDE MASTER turnstile.

- The control signal of the inner Passage Light **PL1** is connected using a cable connector to the **K11** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.

- The power supply of the outer Passage Light **PL2** in the SIDE MASTER turnstile is connected from both sides using cable connectors and connected to the **X2** terminal located in the SIDE MASTER turnstile.

- The control signal of the outer Passage Light **PL2** is connected using a cable connector to the **K12** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.

4.14.2. Connecting the PASSAGE LIGHT in the SIDE SLAVE turnstile

- The power supply of the inner Passage Light **PL3** in the SIDE SLAVE turnstile is connected from both sides using cable connectors and connected to the **X3** terminal located in the SIDE SLAVE turnstile.

- The control signal of the inner Passage Light **PL3** is connected using a cable connector to the **K11** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.

- The power supply of the outer Passage Light **PL4** in the SIDE SLAVE turnstile is connected from both sides using cable connectors and connected to the **X3** terminal located in the SIDE SLAVE turnstile.

- The control signal of the outer Passage Light **PL4** is connected using a cable connector to the **K12** connector on the **CLU1** optical signalization electronics located in the SIDE MASTER turnstile.

4.14.3. Connecting the PASSAGE LIGHT in the MIDDLE turnstile

- The power supply of the inner Passage Light **PL1** on the MASTER side of the turnstile is connected using a cable connector to the **K11** connector on the **CLU1** optical signalization electronics located in the MASTER side of the turnstile.

- The control signal of the inner Passage Light **PL1** on the MASTER side of the turnstile is connected using a cable connector to the **K11** connector on the **CLU1** optical signalization electronics located in the MASTER side of the turnstile.

- The power supply of the inner Passage Light **PL3** on the SLAVE side of the turnstile is connected from both sides using cable connectors and connected to the **K11** connector on the **CLU2** optical signalization electronics located in the SLAVE side of the turnstile.

- The control signal of the inner Passage Light **PL1** on the SLAVE side of the turnstile is connected using a cable connector to the **K11** connector on the **CLU2** optical signalization electronics located in the SLAVE side of the turnstile.
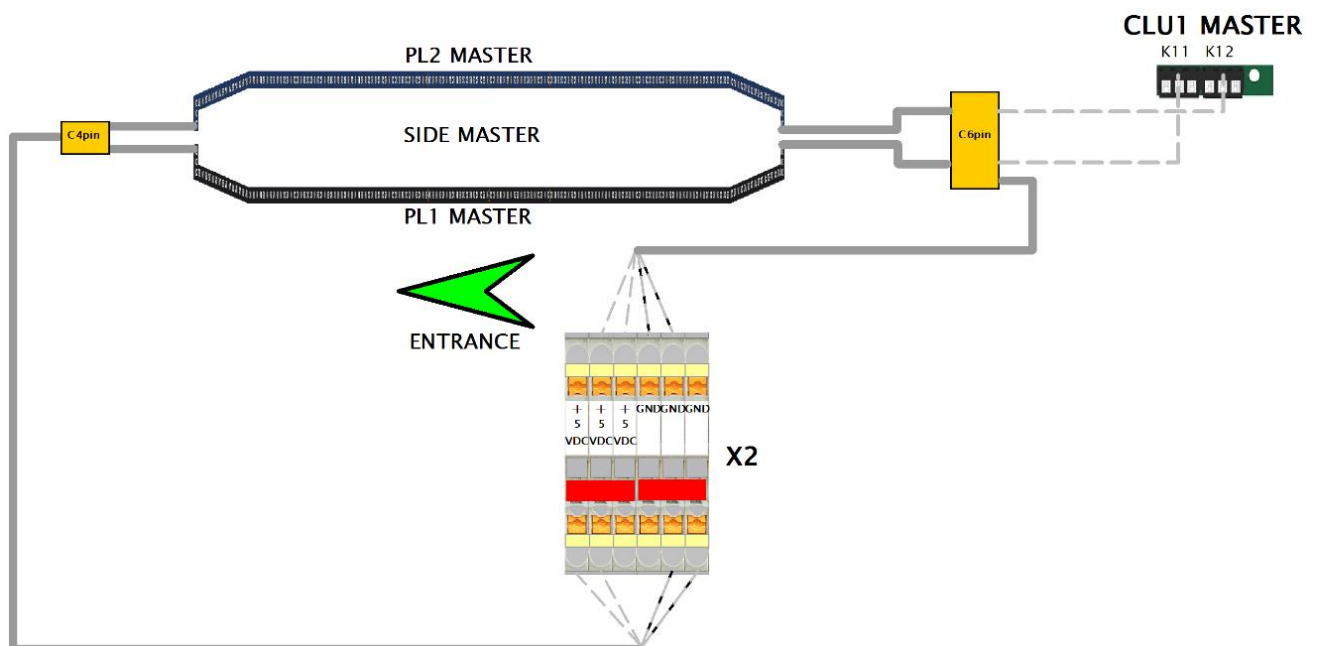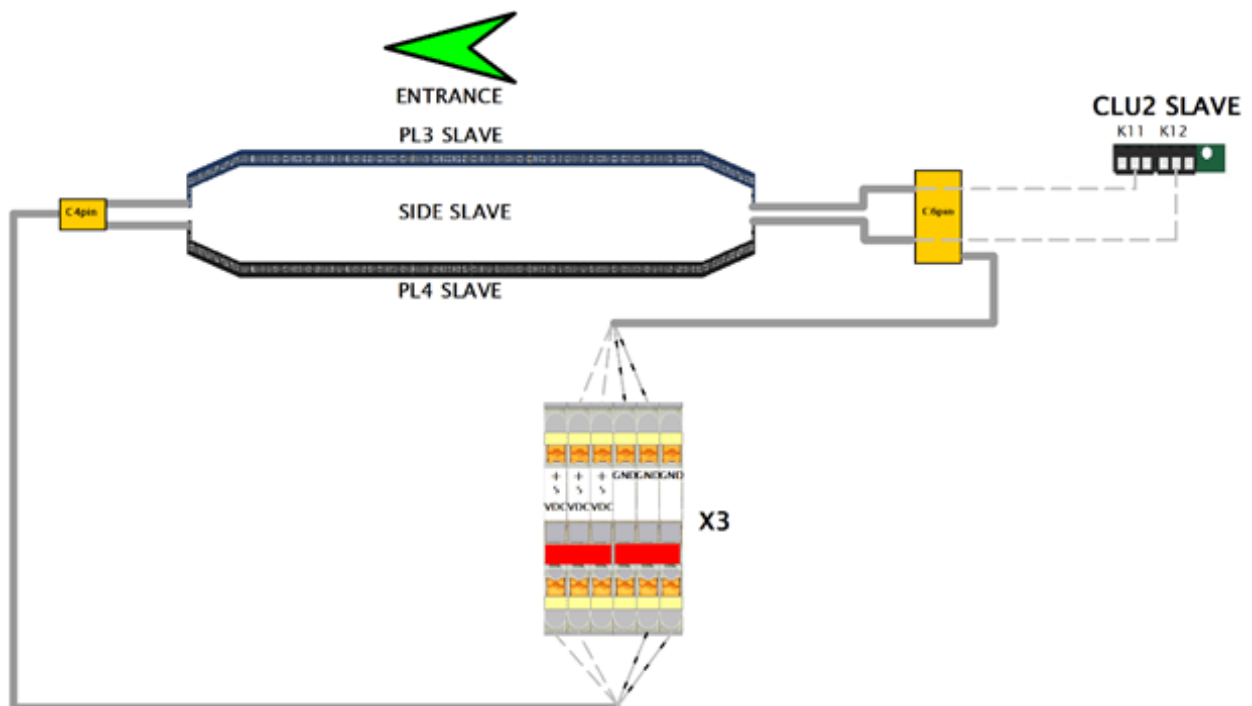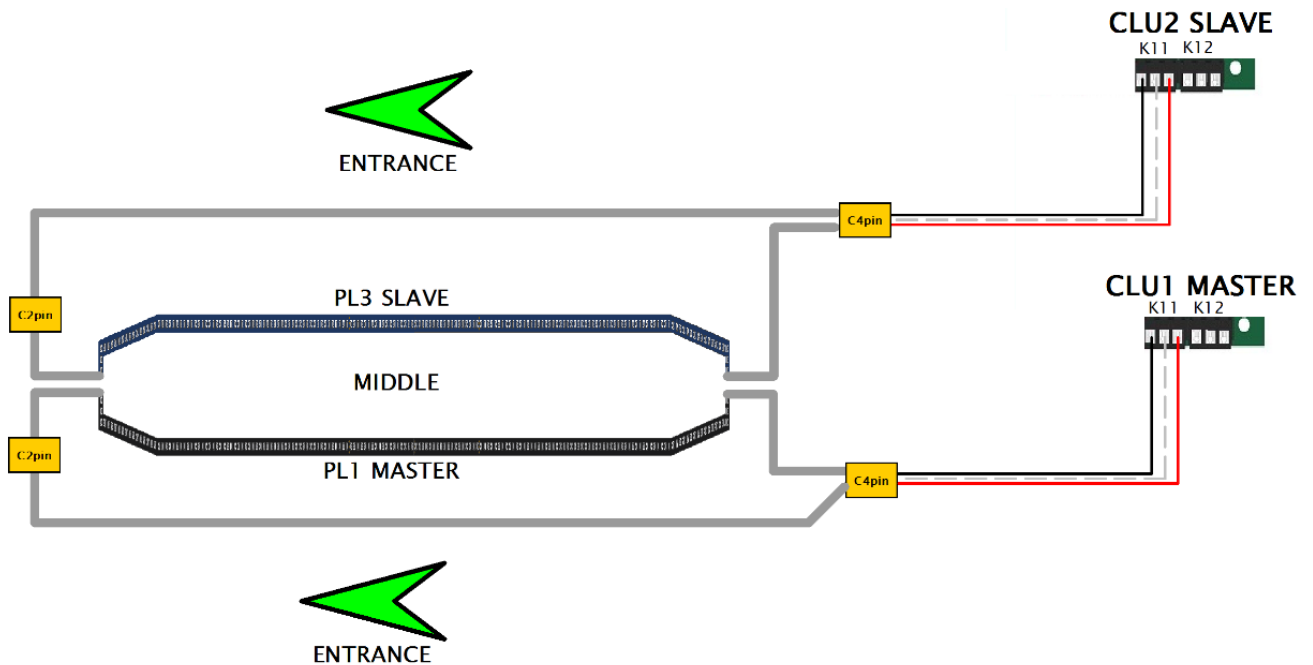
4.15. CONNECTING THE WING LIGHT

- The Wing Light **WL1** of the MASTER turnstile is connected using a cable connector to the **K2** connector on the **CLU1** optical signalization electronics located in the MASTER turnstile.

- The Wing Light **WL2** of the SLAVE turnstile is connected using a cable connector to the **K2** connector on the **CLU2** optical signalization electronics located in the SLAVE turnstile.

- Connecting the **WL1/WL2** to the **CLU1/CLU2** optical signalization electronics is identical to the following figure.

4.16. CONNECTING THE WAV PLAYER SPEAKER

- The **SP** speaker is connected to the **K2** connector on the **MLU10** control electronics located in the MASTER turnstile.
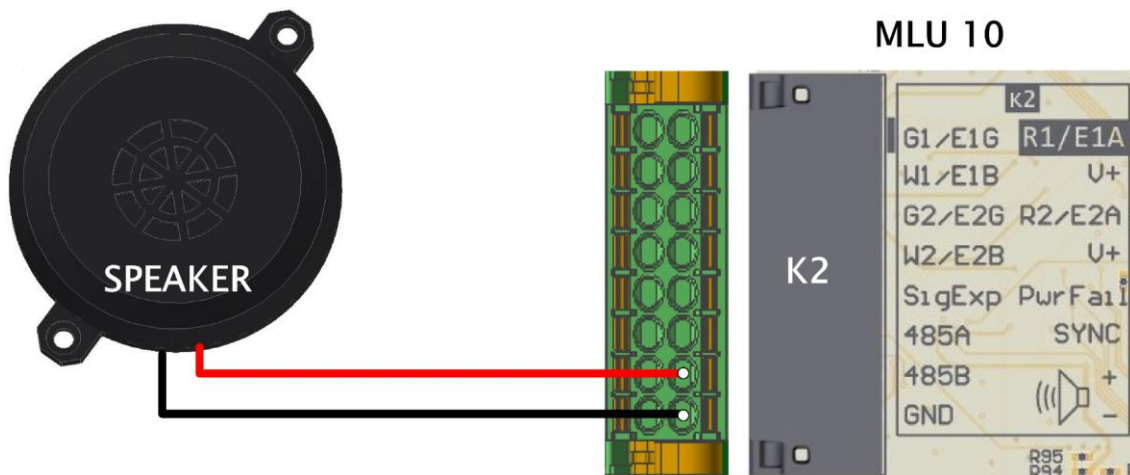
4.17. CONNECTING THE SIGNAL EXPANDER

- The **SE** Signal Expander is an input and output expansion module controlled by the MLU10 electronics.

- The power supply and RS458 DATA IN line control are connected to the **X2** terminal located in the MASTER turnstile.

- The inputs and outputs of the Signal Expander are not routed to the **XU** terminal block and are connected directly into the Signal Expander connectors.
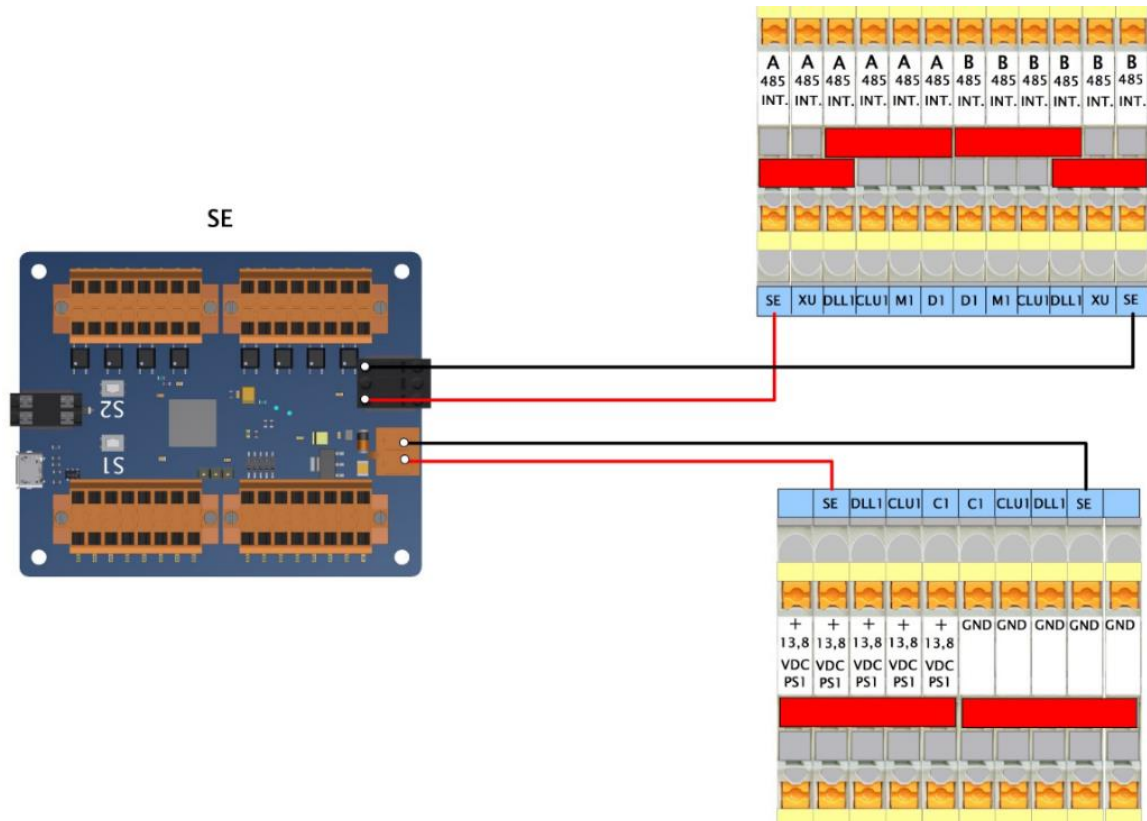
4.18. CONNECTING THE RS485 COMMUNICATION LINES

- Two communication lines RS 485 DATA INT and RS 485 DATA EXT are used to control the turnstile.

- The internal and external communication lines must not be connected in any case at any point.

4.18.1. Connecting the RS485 D1 DISTRIBUTOR

- Both communication lines are routed through the **D1** distributor which allows for fast service connection using free connectors.

- Internal communication line RS 485 DATA INT is routed from the **MLU10** electronics **K2** connector through the **D1** distributor to the **X2** terminal.

- External communication line RS 485 DATA INT is routed from the **MLU10** electronics **K4** connector through the **D1** distributor to the **X2** terminal.
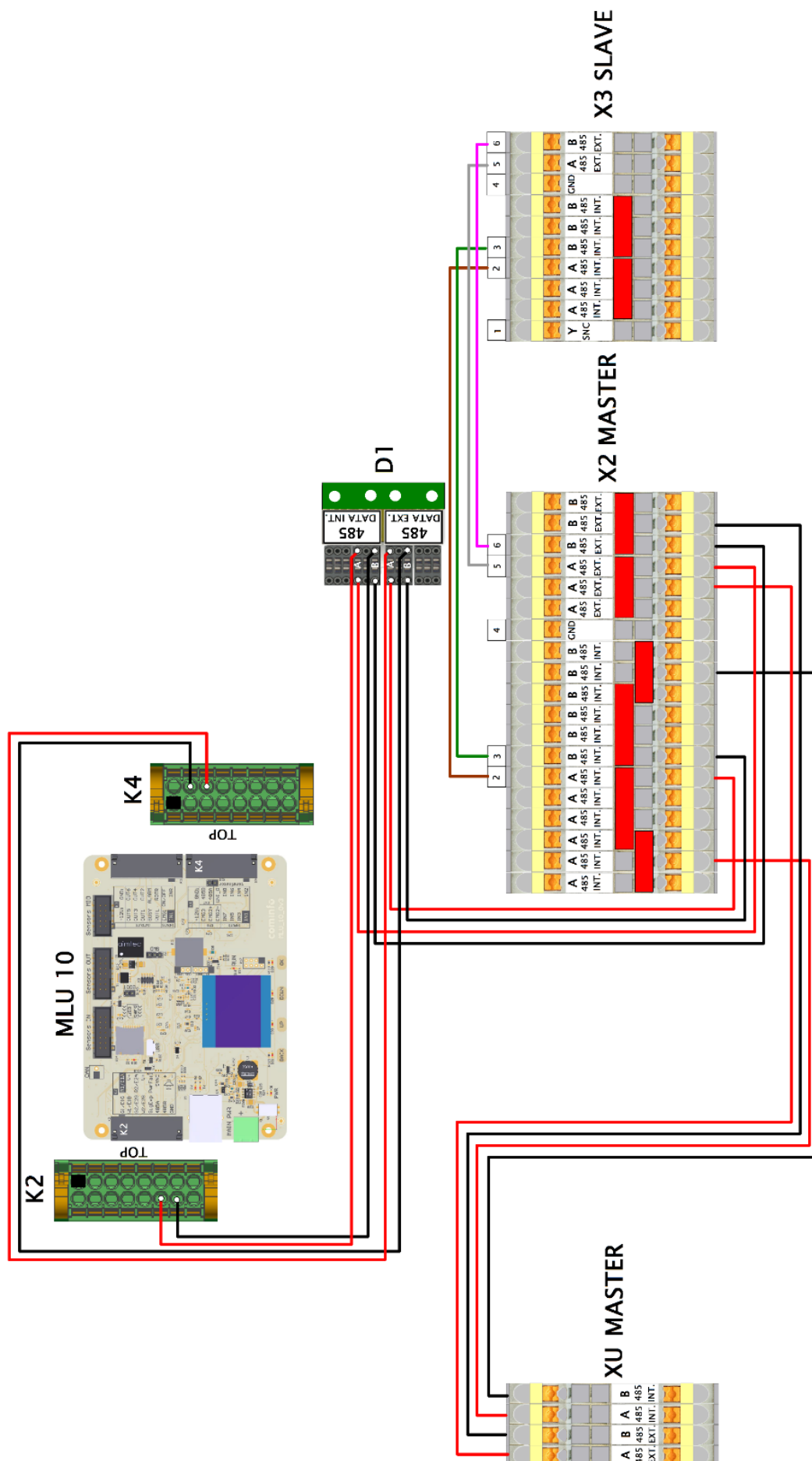
4.18.2. Connecting the internal communication line RS485 DATA INT.

- The internal communication line is used to connect internal devices, which is always done by the manufacturer.

- In the master turnstile, the following is connected to the internal RS485 DATA INT. line via the **X2** terminal:

  - o **M1** – MDD168 master drive unit
  - o **CLU1** - master optical signalization electronics
  - o **DLL1** - Digital Lane Light master
  - o **SE** – Signal Expander

- The internal communication line is routed through the **X2** terminal to the **XU** terminal where it serves for service purposes only.

- The internal communication line is routed through the **X2** terminal to the **X3** terminal of the slave turnstile.

- In the slave turnstile, the following is connected to the internal RS485 DATA INT. line via the **X3** terminal:

  - o **M2** – MDD168 slave drive unit
  - o **CLU2** - slave optical signalization electronics
  - o **DLL2** - Lane Light slave

Shielding connection of internal devices of the RS485 DATA INT line

- Shielding is not usually connected for internal devices.

- In case of high interference, shielding is only connected on one side of the MASTER-SLAVE cable.

- In the Master turnstile, shielding is connected on the **X2** terminal block to the **S SHD** terminal.

4.18.3. Connecting the external communication line DATA EXT.

- The external communication line is used to connect the remote control, which is connected during the turnstile installation.

- External communication line is used in case of remote control by older COMINFO products or in case of joint control of turnstiles that are equipped with **MLU5** and **MLU10** electronics.

- The external communication line is used to connect the PC with T-CONF MLU5 application when configuring the Touch panel.

  It is not possible to configure the turnstiles with MLU10 electronics through the external communication line.

- The external communication line is routed to all terminal blocks to allow connecting the remote control to any installed cabinet.

- The external communication line is routed through the **X2** terminal to the **XU** terminal, where it primarily serves for user connection.

- It is routed through the **X2** terminal via interconnecting cable to the **X3** terminal of the slave turnstile.

- In the MIDDLE turnstile, the external communication line of both gates is interconnected via connecting the **X2** master terminal and **X3** slave terminal of the preceding gate.

- The following remote control products can be connected to external communication line of any **XU X2 X3** terminal blocks.

  o Touch Panel
  o Easy Touch old version 1.1.5.
  o Easy Touch new version 1.4. with USB/RS485 converter
  o PC with T-MON3 and TMON4 application with USB/RS485 converter

- It is only possible to use the converter supplied by the COMINFO company.

- Computer with T-MON3 application must have the Turnstile server installed.

- Computer with T-MON4 application can have the Turnstile server or TComServer installed.

- The connection principle of individual devices is shown on the following figure.

-
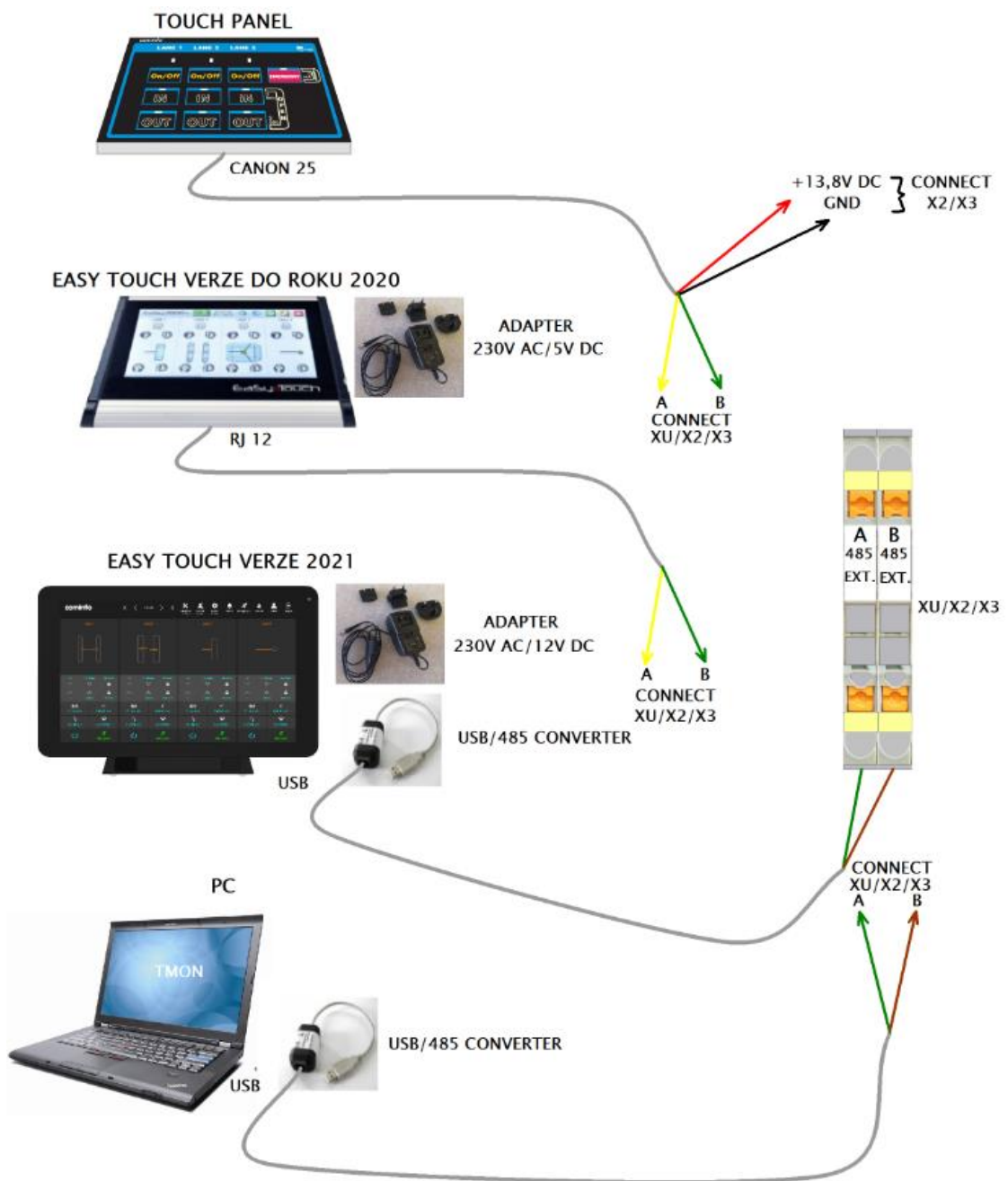
- They can also be connected to the free RS485 DATA EXT connector on the D1 distributor.

- The connection principle of individual devices is shown on the following figure.
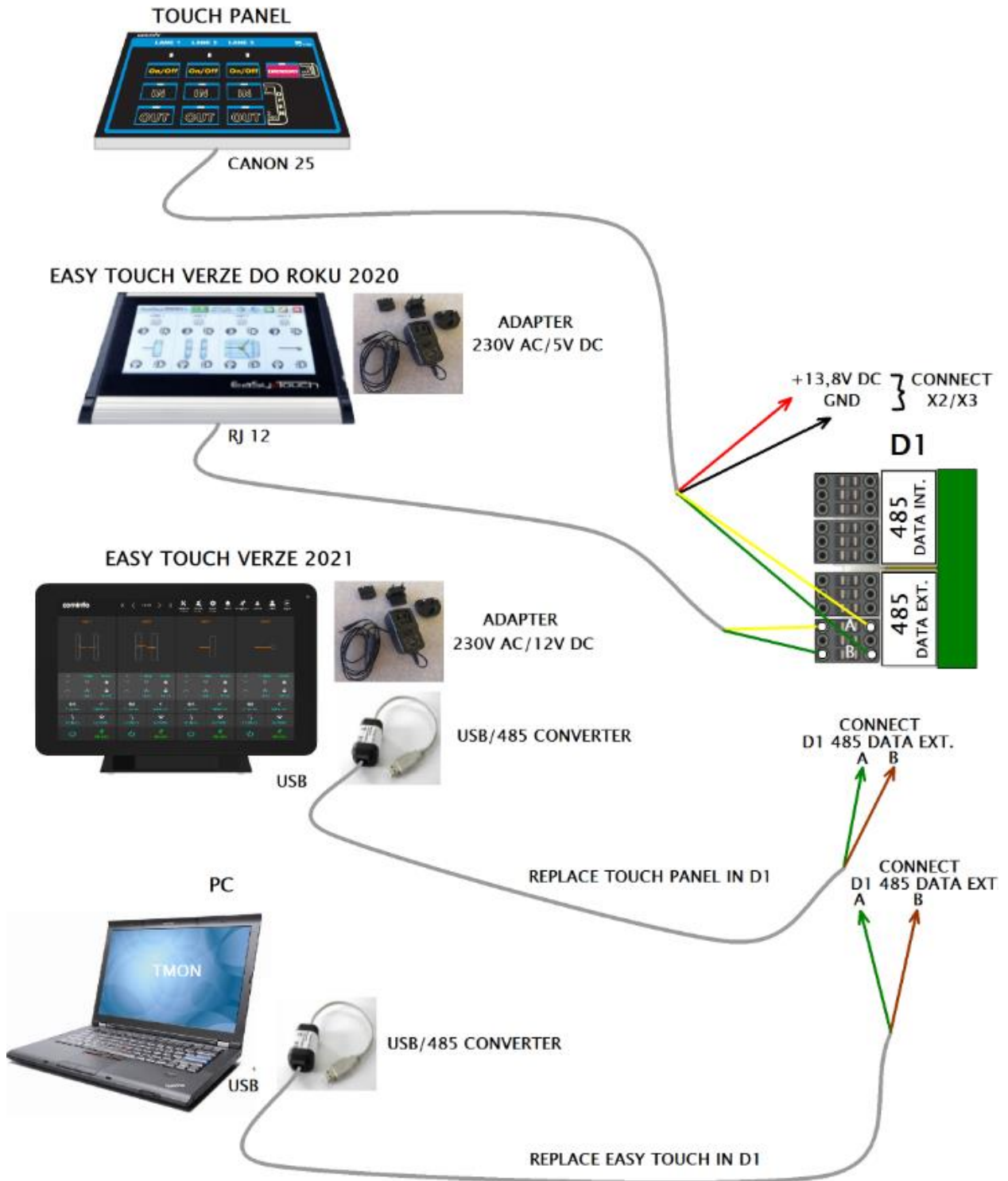
Connection of terminating resistor of external communication line RS485:
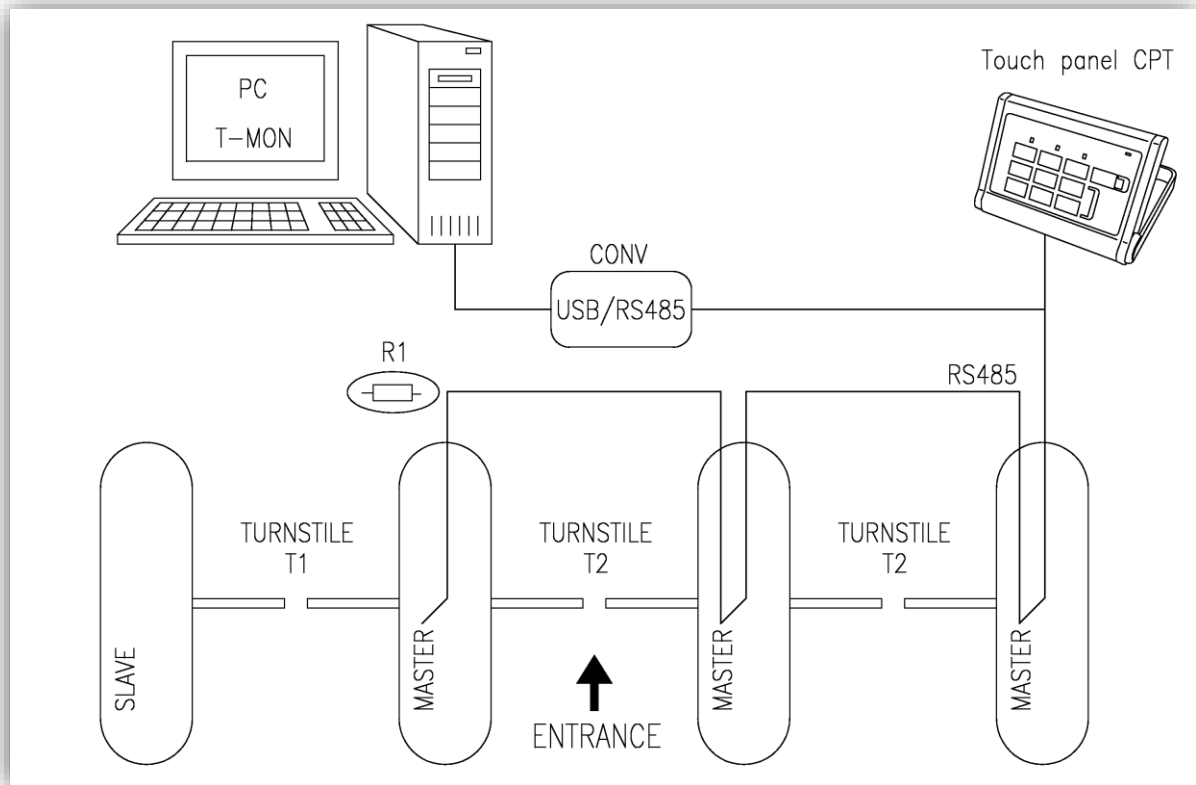
The connection of PC, Touch panel CPT and turnstiles via the RS485 line is shown of the figure above.

- By default, only the T1 turnstile jumper is connected, as described in the *MLU10 connectors layout* chapter.

- If only the CPT panel is connected to the RS485 line, it is necessary to set the DIP-Switch inside the CPT according to the instructions.

- When replacing the MLU10 control electronics in the T1 turnstile, it is necessary to connect the jumper on the MLU10 electronics.

For more detailed information, request a separate manual: *RS485 Connection Principles*.

Connection of RS485 line shielding:

The RS485 line shielding does not have to be connected by default. In case of CPT panel malfunctioning, connect the shielding only on the CPT panel side.

4.19. ETHERNET CONNECTION

- Controlling via ETHERNET is used for remote control of turnstiles with MLU10 electronics by new COMINFO products:

  o Easy Touch version 1.4 (Android)
  o PC with T-MON4 web application

- A PC with the T-CONF MLU10 web application is also connected through ETHERNET to configure the MLU10 electronics and MDD168 drive units.

  o It is possible to perform the configuration remotely over the ETHERNET or connect the PC directly into the RJ connector of the MLU10 electronics.

- The ETHERNET control in the turnstile is connected to the RJ45 connector according to the chapter *CONNECTING THE MLU10 CONTROL ELECTRONICS*.

- In case of controlling more turnstiles, each of them must be connected to a separate socket with separate address in the ETHERNET network.

4.19.1. Connecting a separate turnstile and Easy Touch without using a PC

- A separate turnstile can be connected to a single Easy Touch by simply connecting the RJ45 connectors with a network cable.

- Both devices must have static IP addresses set.

```
┌──────────────┐           ┌──────────────┐
│  TURNSTILE   │───────────│  EASY TOUCH  │
│    MLU10     │           │              │
└──────────────┘           └──────────────┘
```
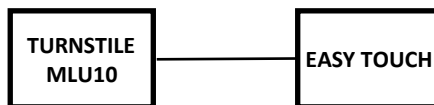
4.19.2. Connecting the turnstiles with a single Easy Touch without using a PC

- A SWITCH or a ROUTER must be used in case of connecting more turnstiles with a single Easy Touch.

  o When using a SWITCH, all connected devices must have static IP addresses set.

  o **A ROUTER allows to connect devices with dynamic IP addresses.**

```
┌───────────────────────────────────────────────────┐
│                 SWITCH / ROUTER                    │
└───────────────────────────────────────────────────┘
     │            │              │           │
┌─────────┐ ┌───────────┐ ┌───────────┐ ┌──────────┐
│TURNSTIE │ │TURNSTIET2 │ │TURNSTIE T3│ │EASY TOUCH│
│T1 MLU10 │ │  MLU10    │ │  MLU10    │ │          │
└─────────┘ └───────────┘ └───────────┘ └──────────┘
```

**Devices connected
LAN PORT RJ45 SWITCH / ROUTER**

4.19.3. Connecting the turnstiles with two or more Easy Touch devices without using a PC

- A SWITCH or a ROUTER must be used in case of connecting more turnstiles and Easy Touch devices.

  - When using a SWITCH, all connected devices must have static IP addresses set.

  - A ROUTER allows to connect devices with dynamic IP addresses.

- Turnstile can be controlled only by one Easy Touch device.

Devices connected
LAN PORT RJ45 SWITCH / ROUTER
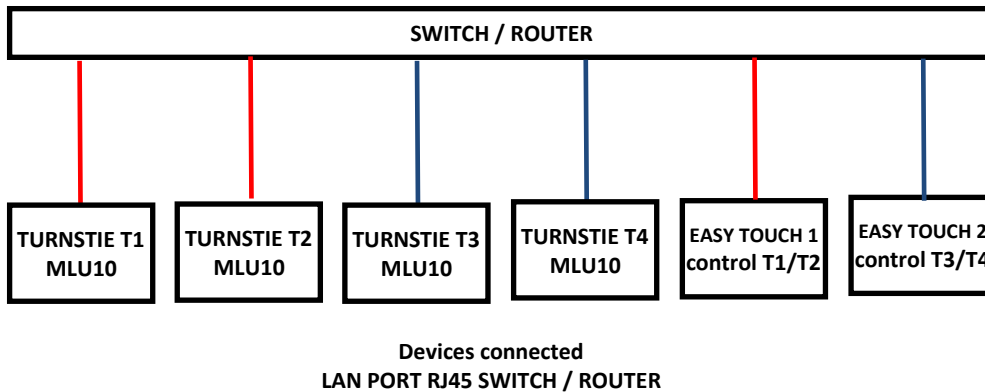
4.19.4. Connecting a separate turnstile and a PC

- A separate turnstile can be connected to a single PC with available network interface controller.

- Computer with T-MON4 application must have the TComServer with TCONF MLU10 web application installed.

- Structure of the software and the connection is shown on the following picture.
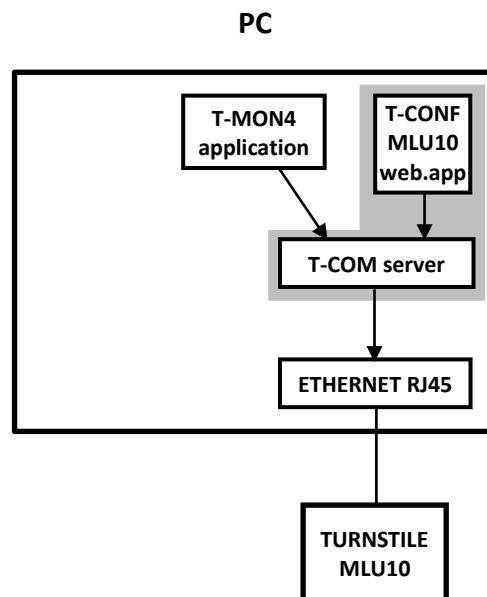
4.19.5. Connecting more turnstiles, Easy Touch and a PC

- To connect more turnstiles, Easy Touch and a PC it is necessary to use a SWITCH or a ROUTER.

    o When using a SWITCH, all connected devices must have static IP addresses set.

    o A ROUTER allows to connect devices with dynamic IP addresses.

- A server PC must have the TComServer with TCONF MLU10 web application installed.

- Each client PC must have the T-MON4 application installed.

- When connecting more computers (client PCs) with T-MON4 application, the TComServer must be installed only on one PC-S computer (server computer).

- Configuration of the turnstiles from the client computers is done through a web browser.

- In case of connecting with a PC it is possible to control the same turnstile from more Easy Touch devices.

- Using a SWITCH or a ROUTER with a WAN port you can connect computers to local network with possibility of connecting to the internet.

- Installation of TComServer with TCONF MLU10 web application and T-MON4 application, network settings and setting the IP addresses of individual devices are described in a separate document.

- Structure of the software and the connection is shown on the following picture.
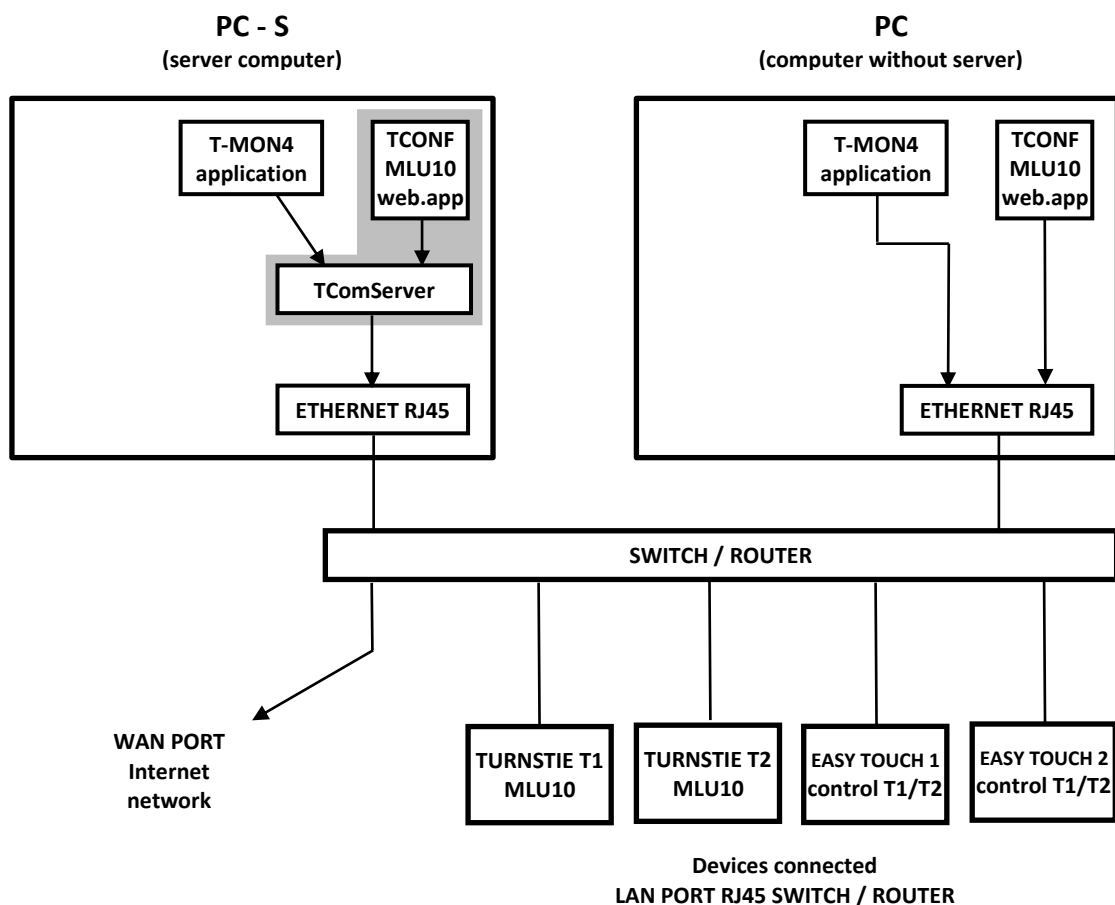
4.20. CONNECTING THE ETHERNET/RS485 DATA EXT

- Turnstiles with **MLU5** electronics can be controlled and configured only through the external communication line RS-485 DATA EXT.

- Turnstiles with **MLU10** electronics can be controlled through the external communication line RS-485 DATA EXT or through ETHERNET. Note - MLU10 can be configured only through ETHERNET connection.

- Connecting both communication systems is used to be able to control and configure turnstiles with both, **MLU5** and **MLU10** electronics simultaneously.

- To control the external communication line RS-485 DATA EXT, the PC-S computer has to have the Turnstile server installed.

- For controlling through ETHERNET, the PC-S computer must have the TComServer with TCONF MLU10 web application installed.

- When connecting more computers (client PCs), the Turnstile server and TComServer must be installed only on one PC-S computer (server computer).

- For controlling, each client PC must have the T-MON4 application installed.

- To configure turnstiles with MLU5 electronics, each client PC must have the TCONF MLU5 application installed.

- Configuration of the MLU10 turnstiles from the client PCs is done through a web browser.

- Using a SWITCH or a ROUTER with a WAN port you can connect computers to local network with possibility of connecting to the internet.

- Installation of TComServer with TCONF MLU10 web application and T-MON4 application, network settings and setting the IP addresses of individual devices are described in a separate document.

- Structure of the software and the connection of all devices is shown on the following picture.

PC - S
(server computer)

PC
(computer without server)

TCONF MLU5 aplikace	T-MON4 aplikace	TCONF MLU10 web.ap.

Turnstile server	TComServer

USB Port	ETHERNET RJ45

TCONF MLU5 aplikace	T-MON4 aplikace	TCONF MLU10 web.ap.

ETHERNET RJ45

USB/RS-485

SWITCH / ROUTER

TURNSTILE T3 MLU5	TURNSTILE T4 MLU5

TURNSTIE T1 MLU10	TURNSTIE T2 MLU10	EASY TOUCH 1 control T1/T2	EASY TOUCH 2 control T1/T2

**Devices connected
LAN PORT RJ45 SWITCH / ROUTER**

TOUCH PANEL

EASY TOUCH 3 Version to year 2020

WAN PORT Internet network

USB/RS-485	EASY TOUCH 4 Control T3/T4/T5/T1

← **Connection only with COMINFO USB/RS-485 converter**

TURNSTIE T5 MLU10

← **Turnstile connection with MLU10 electronics without configuration option**

5. BASIC PRINCIPLE OF THE TURNSTILE CONTROL

**All of the turnstile functions are controlled by the MLU10 electronics.
They are controlled simultaneously by following control and communication systems.**

5.1. CONTROLLING BY STATUS SIGNALS

- Controlling by status signals is used with all superior systems.

- The MLU10 electronics receives and processes input control signals from the superior system.

- The MLU10 electronics sends the turnstile output control status signals to the superior system.

- The MLU10 electronics controls the execution of the EMERGENCY function based on the signal from the fire alarm system.

5.2. CONTROLLING VIA ETHERNET

- Controlling via ETHERNET is used for remote control of the turnstile by new COMINFO products:

  - Easy Touch version 1.4 (Android)
  - PC with T-MON4 application

- A PC with the T-CONF web application is also connected through ETHERNET to configure the MLU10 electronics and the MDD168 drive units.

5.3. CONTROLLING BY THE EXTERNAL COMMUNICATION LINE RS485 DATA EXT

- Controlling by the external communication line is used for backwards compatibility with older remote control products by COMINFO:

  - Touch Panel
  - Easy Touch version 1.1.5 (Linux)
  - T-MON3

- Controlling by the external communication line is used for simultaneous control of turnstiles equipped with **MLU5** and **MLU10** electronics.

5.4. CONTROLLING BY THE INTERNAL COMMUNICATION LINE RS485 DATA INT

- The MLU10 electronics uses the 485 communication line to control all internal devices of the turnstile.

- Internal communication line directly controls following devices:

  - MDD168 drive unit
  - Digital lane light
  - Signal expander
  - CLU - optical signalization electronics which controls following devices:
    - Back light
    - Passage light
    - Edge light
    - Winglight

6. DESCRIPTION OF CONTROLLING THE TURNSTILE BY STATUS SIGNALS

6.1. INPUT CONTROL SIGNALS

6.1.1. Description of the input control signals function.

- **INL input** - the input activates single or permanent passage by the turnstile in the INL direction.

- **INR input** - the input activates single or permanent passage by the turnstile in the INR direction.

- **ON/OFF input** - input for deactivating the turnstile

- **EMG1 input** - input for controlling the EMERGENCY function via the GNDiz signal.

- **+EMG2 input** - input for controlling the EMERGENCY function via +24VDC voltage.

- **-EMG2 input** - input for controlling the EMERGENCY function via -24VDC voltage.

- **IN1-4 inputs** - inputs modifiable for any function.

- **UNI-0** - input for the manufacturer's needs - **DO NOT CONNECT ANY CIRCUITS.**

All input signals are set to NO by the manufacturer. Using the TCONF application it is possible to set any input signal to NO or NC, independently to other inputs.

The turnstile deactivation input ON/OFF is factory set to NO.
Turnstile is permanently activated with this setting.
Turnstile will be deactivated after connecting the control signal to the ON/OFF input.

6.1.2. Lengths of input control signals

Name of the Input Signal	Single Passage	Permanently released passage
INL	>100ms <2000ms)[1]	>2000ms
INR	>100ms <2000ms)[1]	>2000ms
ON/OFF	FOR THE DURATION OF THE INPUT ACTIVATION	
PANIC/EMERGENCY	FOR THE DURATION OF THE INPUT ACTIVATION	

)[1 -] **Recommended length of the input signal for a single passage is 1000ms**

Permanent release mode in one direction can be preset in three ways:

1. By permanently activating the INL or INR input according to the requirements of the permanent release direction.

2. Using the control panel - Touch panel or Easy Touch (see separate manuals).

3. Using the T-MON application (see separate manual).

6.2. OUTPUT CONTROL SIGNALS

6.2.1. Description of the output control signals function.

- **ROT L**   signal for the superior system informing about opening of the passage in the L direction

- **ROT R**   signal for the superior system informing about opening of the passage in the R direction

- **BUSY**   signal for the superior system informing about released or ongoing passage

- **ALARM**   Attempt for an unauthorized passage

All input signals are factory set to NO. Using the TCONF application it is possible to set any input signal to NO or NC, independently to other inputs

6.2.2. Lengths of output control signals:

Name of the Output Signal	Signal Duration
ROTL	>200ms
ROTR	>200ms
BUSY	FOR THE DURATION OF PASSAGE

6.3. PASSAGE SIGNALS TIMING DIAGRAM

1. Home position – device is waiting for passage permission (INL, INR input activation)

2. Input activation - passage permitted

3. Phase of the passage - person in the corridor

4. Counting of passing person

5. Phase of closing wings
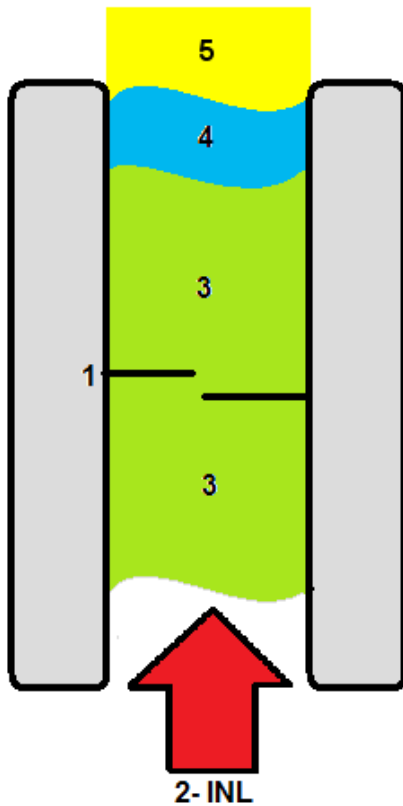
Turnstile passage signals timing diagram
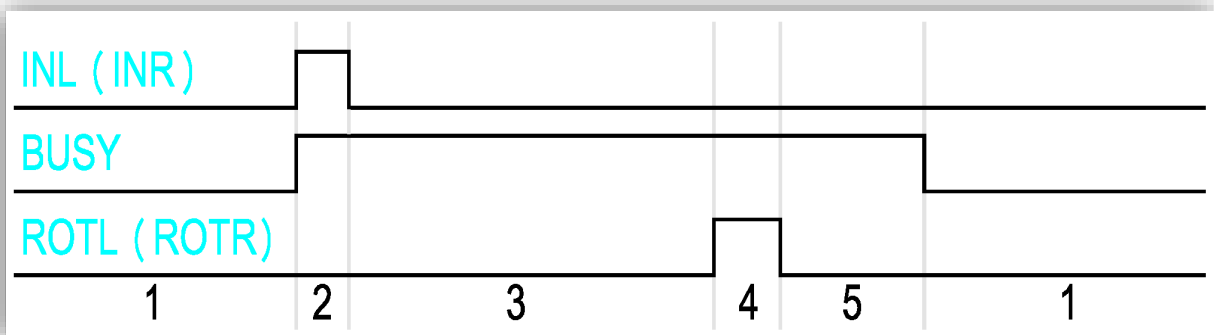
7. DESRIPTION OF REMOTE CONTROLING OF THE TURNSTILE

It is possible to control the turnstile simultaneously by all available control systems.

- **The turnstile controlled by status signals through a superior system can be simultaneously controlled by COMINFO products from any location via ETHERNET or through external communication line RS 485 DATA EXT.**

- **Apart from the superior system, also TOUCH PANEL, EASY TOUCH and computers with the T-MONITOR application can be simultaneously connected.**

- **All these control systems display statuses independently triggered by any of them.**

- **Information on statuses triggered by any of these devices are sent to the superior system by the MLU10 electronics by status signals.**

7.1. CONTROLLING THE TURNSTILE BY THE TOUCH PANEL

- It is a simple control panel with capacitive buttons and LED signalization.

- You can control 3 turnstiles with the EMERGENCY function or 4 turnstiles without this function with one TOUCH PANEL.

- In case you need to control more turnstiles from one location, it is possible to use more TOUCH PANELS.

- Setting the TOUCH PANEL is done through the T-CONF MLU5 application.

- Connection and setting of the TOUCH PANEL is described in a separate manual.

7.2.   CONTROLLING THE TURNSTILE BY THE EASY TOUCH PANEL

- It is a comfortable control panel with a touch screen and plenty of functions.

- You can control up to 30 turnstiles with one EASY TOUCH.

- Computer is not needed for setting the EASY TOUCH - it is done directly on the touch screen.

- Connection and setting of the EASY TOUCH is described in a separate manual.

7.3. CONTROLLING THE TURNSTILE BY T-MONITOR APPLICATION

- It is the highest level of control of COMINFO turnstiles.

- The T-MONITOR application allows:

  o controlling all the turnstile functions
  o turnstile status monitoring
  o automatic control of turnstile activation/deactivation using the PASSAGE SCHEDULER.

- You can control unlimited number of turnstiles with the T-MONITOR application.

- The T-MONITOR application is described in a separate manual.
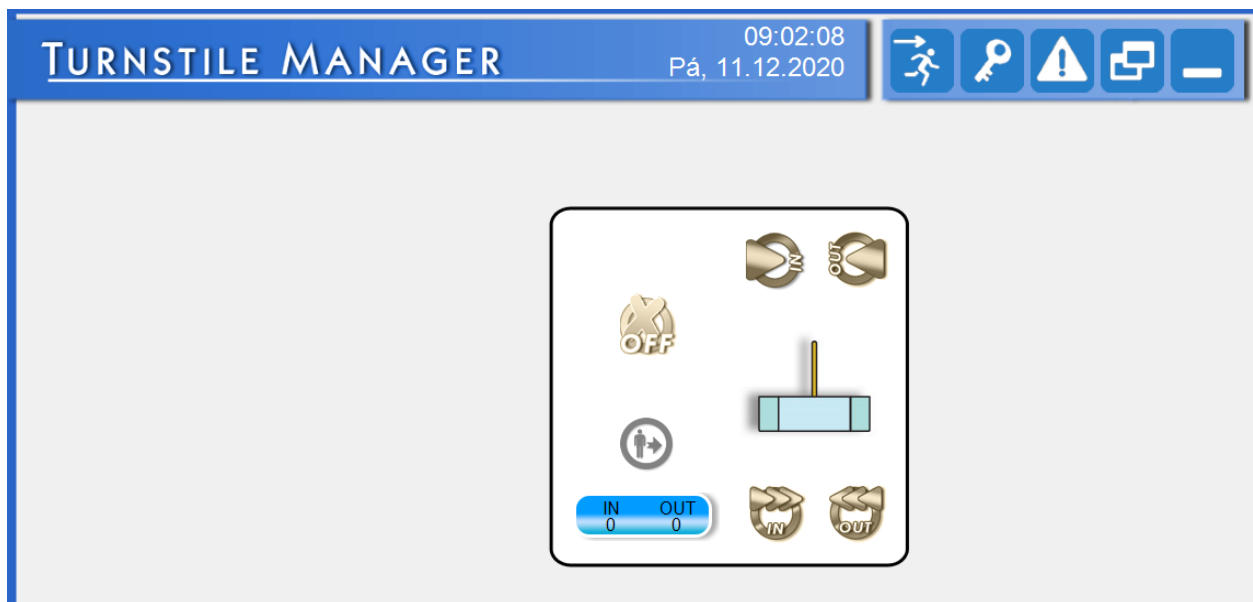
8. TURNSTILE POWER SUPPLY

8.1. CONNECTING THE EXTERNAL POWER SUPPLY 24VAC/50-60Hz

8.1.1. External power supply 230VAC/24VAC requirements

- The turnstile may be delivered in a version for 24VAC external power supply (transformer 230VAC/24VAC) placed outside of the turnstile.
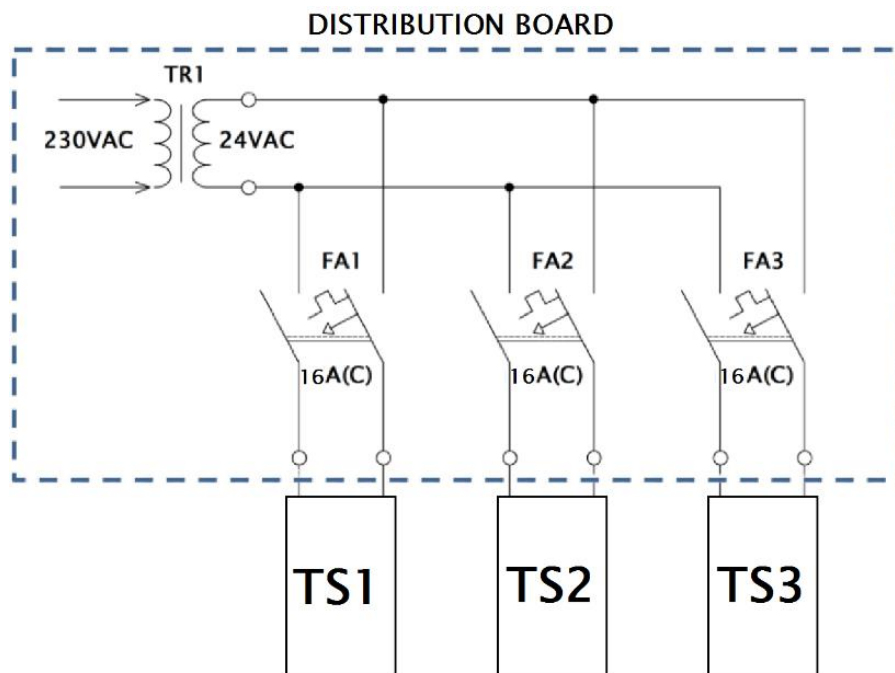
  THE TRANSFORMER MUST COMPLY WITH THE REQUIREMENTS OF THE SELV POWER NETWORK

  THE TRANSFORMER MUST BE DIMENSIONED ACCORDING TO THE CHAPTER POWER INPUT OF THE TURNSTILE

- Each turnstile must have a separate double-pole protection according to the following figure

Circuit diagram:

In case of a failure, both poles of the power supply will disconnect and the turnstile will be completely disconnected from the common supply transformer.

IN CASE OF DOUBLE-POLE PROTECTION YOU CANNOT USE TWO SINGLE-MODULE CIRCUIT BREAKERS

- Two interconnected double-module circuit breakers must be used, which will ensure that when one of them is shut down, the other will be shut down as well.

- The turnstile is equipped with input double-pole C16A circuit breaker. While planning the protection, it is necessary to adapt the circuit breaker selectivity.

- The voltage from the external 24VAC power supply is connected to the main terminal block in the master turnstile **X1**, according to the chapter *ELECTRICAL CONNECTION OF THE TURNSTILE*.

8.1.2.   External 230VAC/24VAC power supplies provided by the manufacturer COMINFO

- COMINFO provides custom-made 230VAC/24VAC power supplies TRAFOCASE.

- The power supplies are installed in an IP67 plastic box and are designed for installation into a turnstile or a set of turnstiles.

- They contain a high-quality 230VAC/24VAC toroidal transformer of the required power.

- The power supplies are equipped with a SOFT START MODULE that ensures problem-free connection to the mains by limiting the current surge on initiation.

- The power supplies are equipped by a single-module double-pole DPC type circuit breakers and a connection terminal.

- The power supplies are made in three versions for one, two and three turnstiles.

- The following figure shows an example of a baseplate of TRAFOCASE power supply for two turnstiles
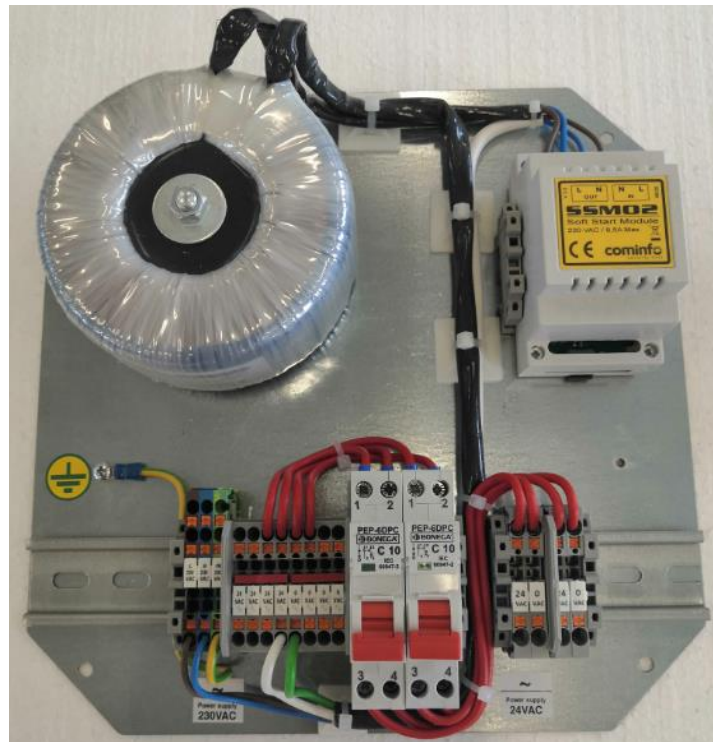
When powering multiple turnstiles by one power supply, the manufacturer recommends to use exclusively the TRAFOCASE power supplies by COMINFO.

When using TRAFOCASE, the manufacturer guarantees trouble-free operation not only in terms of the protection system, but also in terms of circuit breaker selectivity, dimensioning of supply cables and transformer.

Incorrectly designed power supplies including protection and dimensioning are the most frequent cause of problems during the installation of the turnstiles and putting them into full operation mode.

The subsequent cost of troubleshooting and removing malfunctions is several times more expensive than using high-quality and properly designed TRAFOCASE units.

8.2. CONNECTING THE EXTERNAL 230VAC MAINS POWER SUPPLY

APPLIANCE MUST BE CONNECTED IN COMPLIANCE WITH INSTRUCTIONS THAT ARE ATTACHED TO IT AND ALSO IN COMPLIANCE WITH RESPECTIVE LEGAL REGULATIONS AND STANDARDS, WHICH ARE EFFECTIVE IN THE COUNTRY OF INSTALLATION OF THE PRODUCT. CONNECTION MAY BE PERFORMED ONLY BY A QUALIFIED PERSON

Examples of regulations for select countries:

- **CZ: ČSN 33 2000 – 4 – 41 ed.2, ČSN 33 2000-7-706 ed.2, ČSN EN 62305-1 až 4, ČSN 34 0350, ČSN 33 2180**
- **D: DIN VDE 0100-410 Abschnitt 413**
- **EU: IEC 60364-4-41**

CONNECTING THE DEVICE TO THE MAINS POWER SUPPLY IS POSSIBLE ONLY FROM A CIRCUIT EQUIPPED WITH A RESIDUAL-CURRENT DEVICE WITH IΔN=0,03A AND A CIRCUIT BREAKER FOR PROTECTION FROM INJURY BY THE ELECTRIC CURRENT.

Circuit diagram:
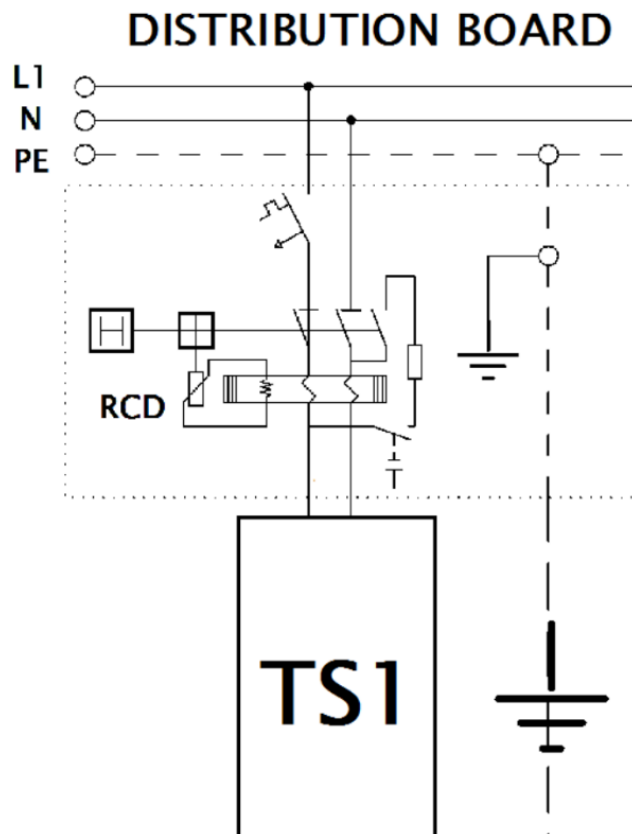
- When powered by 230VAC, the turnstile is equipped with a suppression filter, a 400VA toroidal transformer, and a Sofstarter for limiting the current surge when switching on.

- The turnstile is equipped with input B10A circuit breaker. While planning the protection, it is necessary to adapt the circuit breaker selectivity.

- The 230VAC mains power supply is connected to the main terminal block in the master turnstile **X1** according to the chapter *ELECTRICAL CONNECTION OF THE TURNSTILE*.

8.3. POWER INPUT OF THE TURNSTILE

- The following tables show the power input values of the turnstile and the equipment for which the protection and cross-section of power cables have to be dimensioned.

- These values can be also used for calculating the turnstile power consumption in standby mode.

Table of maximum power input values during the operation of EASYGATE-SPT/SPD turnstile without optional accessories:

Process	Power input [VA]	Note
Maximum consumption during a passage through the turnstile [1]	**360**	For one passage (2x drive units)
Idle state of the turnstile (turnstile OFF)	**35**	Locked in home position
Idle state of the turnstile (turnstile ON)	**10**	Unlocked in home position

Table of power input increase with optional accessories:

Optional accessories	Power input [VA]	Note
Back Light [2]	**+1.5**	1x Back Light
Digital Lane Light [3]	**+5.5**	1x Digital Lane Light
Edge Light	**+50**	Single gate
	+37.5	Outer gate
	+25	Middle gate
Passage Light	**+120**	Single gate
	+90	Outer gate
	+60	Middle gate
Wing Light	**+45**	For one passage - both wings
Card collector	**+35**	Type: MTM-720T
QR scanner	**+1.5**	Type: NLS-FM430

[1]) Maximum power input while reversing the wings when closing.

[2]) Can be installed in one passage direction (1 pc) or in both directions (2 pcs).

[3]) Can be installed in one passage direction (1 pc) or in both directions (2 pcs).

9. COMPLETE WIRING DIAGRAM

9.1. CAPTIONS TO THE DIAGRAMS:

### 9.1.1. Basic elements

C1   - MLU10 control electronics

D1   - Distributor RS485

CLU1   - Control electronics of MASTER optical signalization (Cabinet Lighting unit)

CLU2   - Control electronics of SLAVE optical signalization (Cabinet Lighting unit)

M1   - MASTER drive unit

M2   - SLAVE drive unit (not available in a single-wing version)

ZB1   - MASTER wing tooth brake

ZB2   - SLAVE wing tooth brake (not available in a single-wing version)

TT   - 230V/24V - 400VA toroidal transformer (230VAC power supply version)

SS   - Soft Start Module (230VAC power supply version)

X1   - **24VAC** or **230VAC** main power terminal block

X2   - The MASTER turnstile terminal block

X3   - The MASTER turnstile terminal block

XU   - USER terminal block

PE1   - Master turnstile earthing point

PE2   - Slave turnstile earthing point

ES1   - Earthing terminal block (bridge)

FA1   - 230VAC circuit breaker (230VAC power supply version)

FA2   - 24VAC circuit breaker (both power supply versions)

PS1   - SM12 (24VAC/13.8VDC) power supply for M1

PS2   - SM12 (24VAC/13.8VDC) power supply for M2 (not available in a single-wing version)

RX*   - Receiving sensors in a MASTER turnstile (RX1 – RX4)

TX*   - Transmitting sensors in a SLAVE turnstile (TX1 – TX4)

9.1.2. Equipment

PS3   - SM12 (24VAC/5VDC) power supply for Passage Light Back Side MASTER

PS4   - SM12 (24VAC/5VDC) power supply for Passage Light Back Side SLAVE

SC1   - Supercapacitors for PS1

SC2   - Supercapacitors for PS2 (not available in a single-wing version)

SP   - Speaker for a WAV Player

SE   - Signal Expander

PL1   - MASTER turnstile Passage Light

PL2   - MASTER turnstile Passage Light Back Side

PL3   - SLAVE turnstile Passage Light

PL4   - SLAVE turnstile Passage Light Back Side

BL1   - MASTER turnstile Back Light (Entry)

BL2   - SLAVE turnstile Back Light (Exit)

DLL1   - MASTER turnstile Digital Line Light (Entry)

DLL2   - SLAVE turnstile Digital Line Light (Exit)

EL1   - MASTER turnstile Edge Light (Entry)

EL2   - MASTER turnstile Edge Light (Exit)

EL3   - SLAVE turnstile Edge Light (Entry)

EL4   - SLAVE turnstile Edge Light (Exit)

WL1   - Wing Light for MASTER turnstile wings

WL2   - Wing Light for SLAVE turnstile wings

9.2. LAYOUT OF THE DEVICES IN THE TURNSTILE
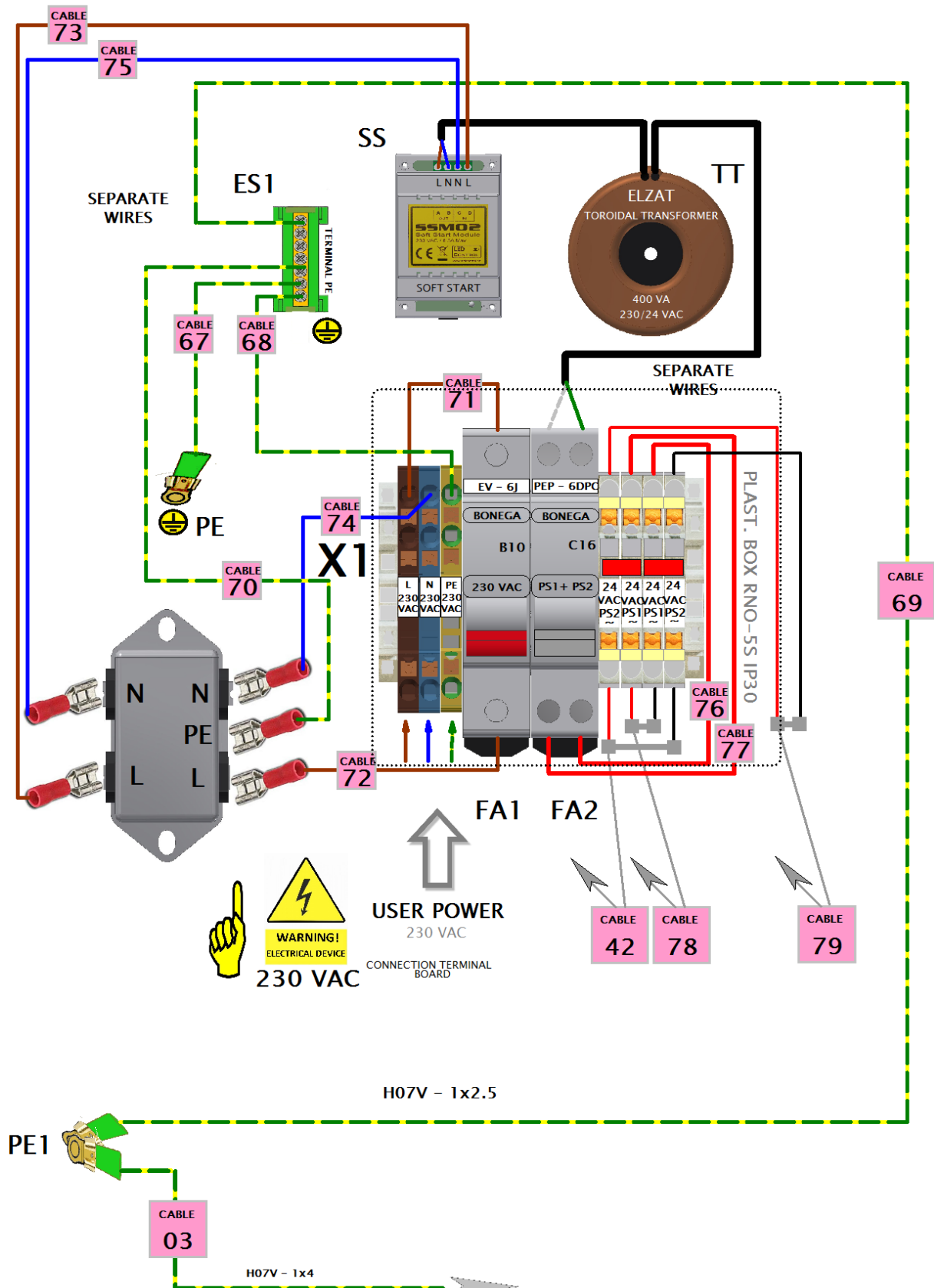
9.2.1. MASTER turnstile
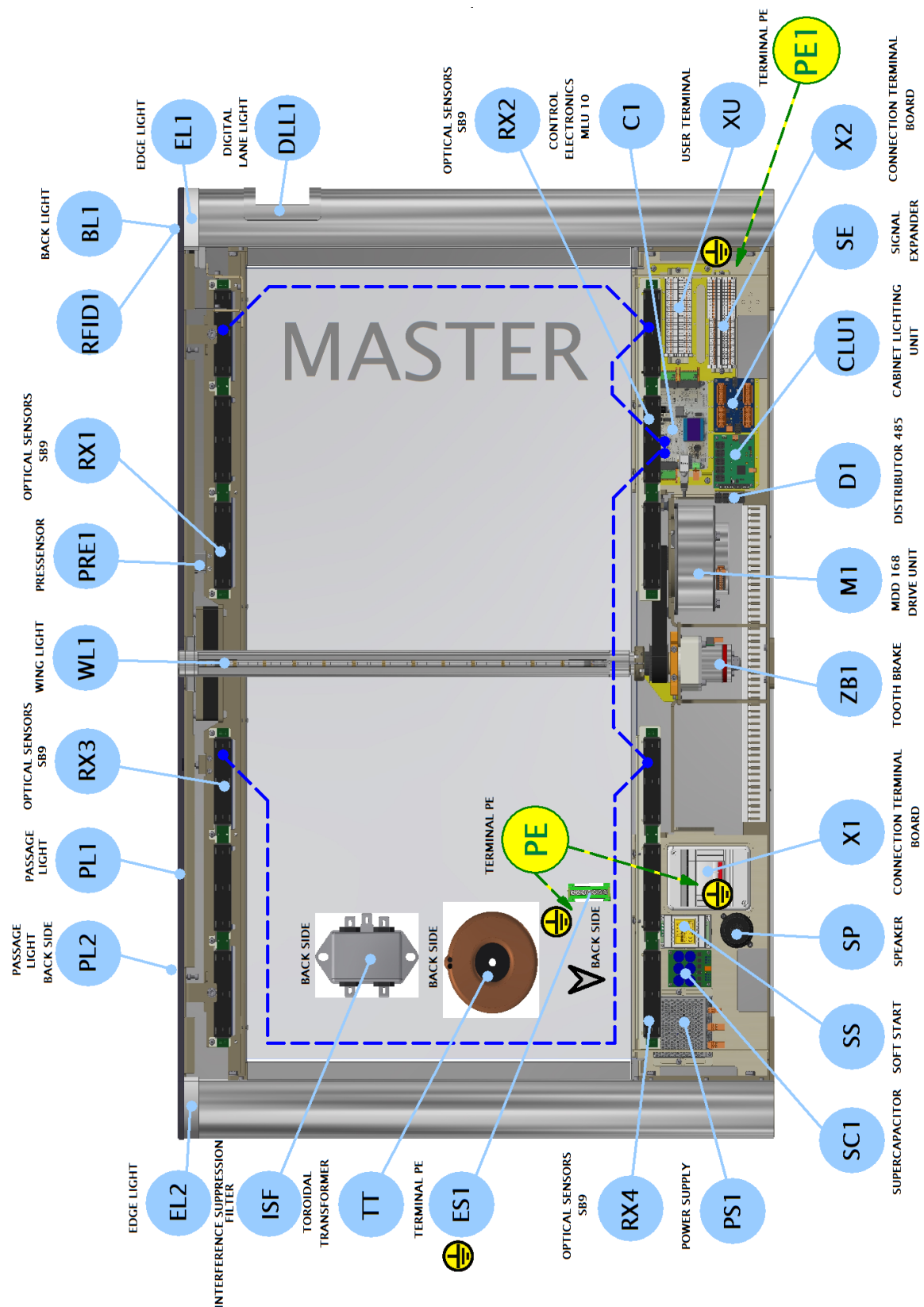
Note: In case of external 24VAC power supply, the turnstile is not equipped with TT transformer and ISF suppression filter.

cominfo
security first

9.2.2. SLAVE turnstile

SLAVE

EDGE LIGHT — EL4
DIGITAL LANE LIGHT — DLL2
BACK LIGHT — BL2
RFID2
OPTICAL SENSORS SB9 — TX4
TERMINAL PE — PE2
CONNECTION TERMINAL BOARD — X3
CABINET LIGHTING UNIT — CLU2
OPTICAL SENSORS SB9 — TX3
WING LIGHT — WL2
PRESSENSOR — PRE2
OPTICAL SENSORS SB9 — TX1
PASSAGE LIGHT — PL3
PASSAGE LIGHT BACK SIDE — PL4
PLACE CPU (OPTICAL SENSORS)
MDD 168 DRIVE UNIT — M2
TOOTH BRAKE — ZB2
SUPERCAPACITOR — SC2
OPTICAL SENSORS SB9 — TX2
POWER SUPPLY — PS2
EDGE LIGHT — EL3

9.3. WIRING DIAGRAM OF TURNSTILE WITH 230VAC POWER SUPPLY

9.3.1. Wiring diagram of the turnstile power supply (230VAC)

9.3.2. Wiring diagram of the X2 MASTER interconnecting terminal block (230VAC)
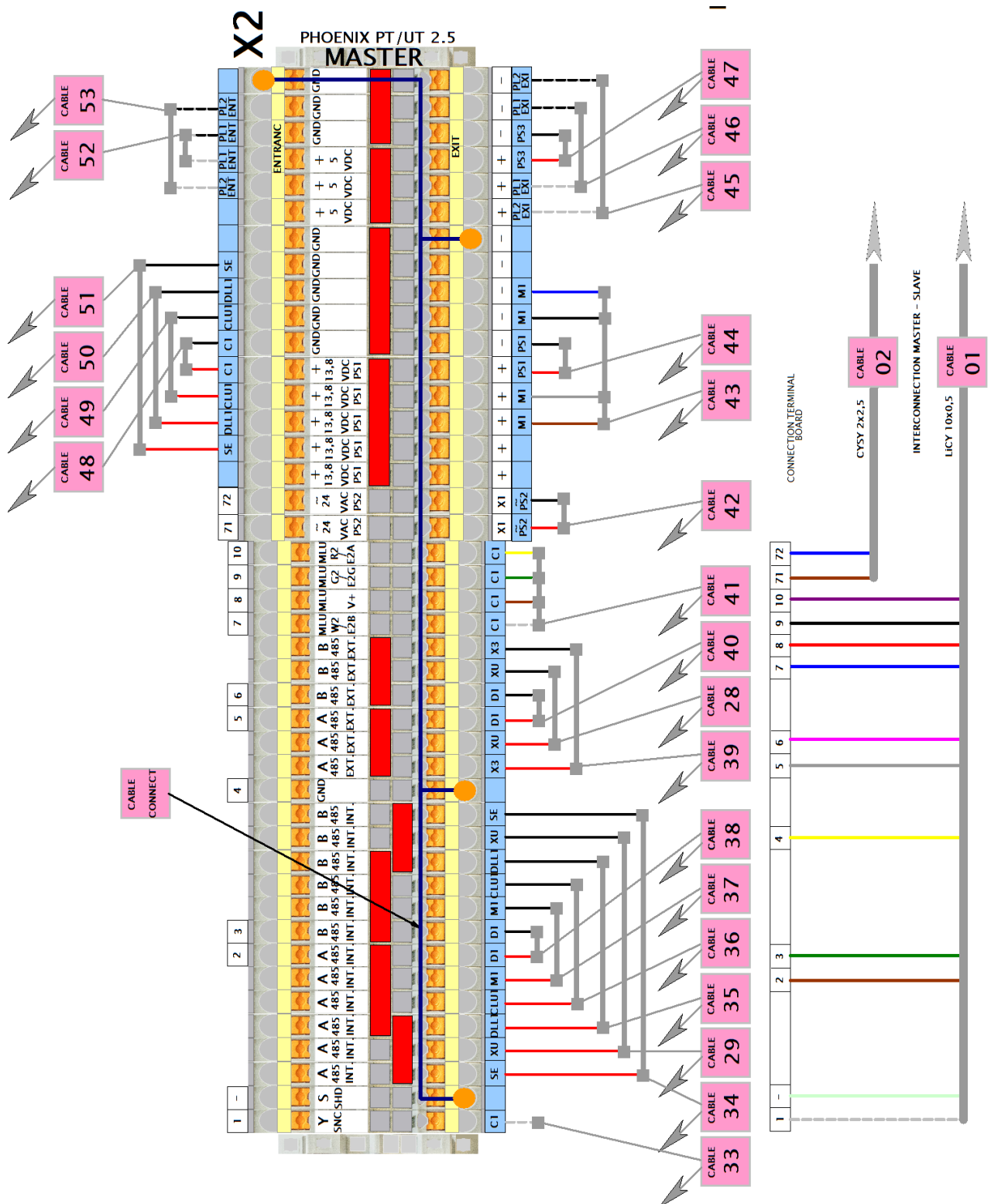
Note:
Cable 39 is only used in the MIDDLE turnstile to interconnect the internal RS485 DATA INT communication line between MASTER terminal **X2** and SLAVE terminal **X3** of the preceding passage.

9.3.3. Wiring diagram of the X3 SLAVE interconnecting terminal block (230VAC)
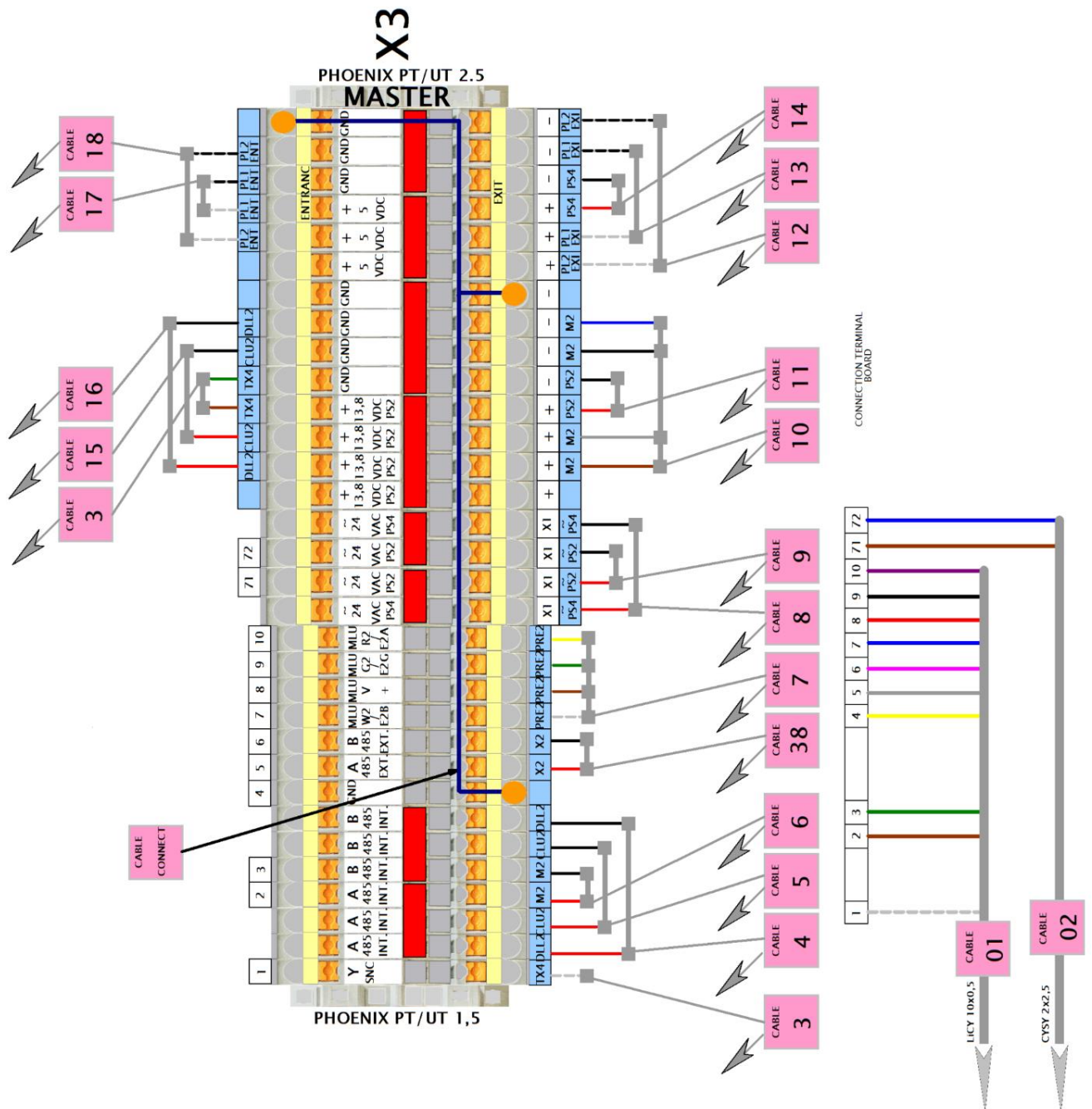
Note:
Cable 39 is only used in the MIDDLE turnstile to interconnect the internal RS485 DATA INT communication line between SLAVE terminal **X3** and MASTER terminal **X2** of the following passage.

9.3.4. Wiring diagram of the XU user terminal block (230VAC)

9.3.5. MASTER wiring diagram (230VAC)
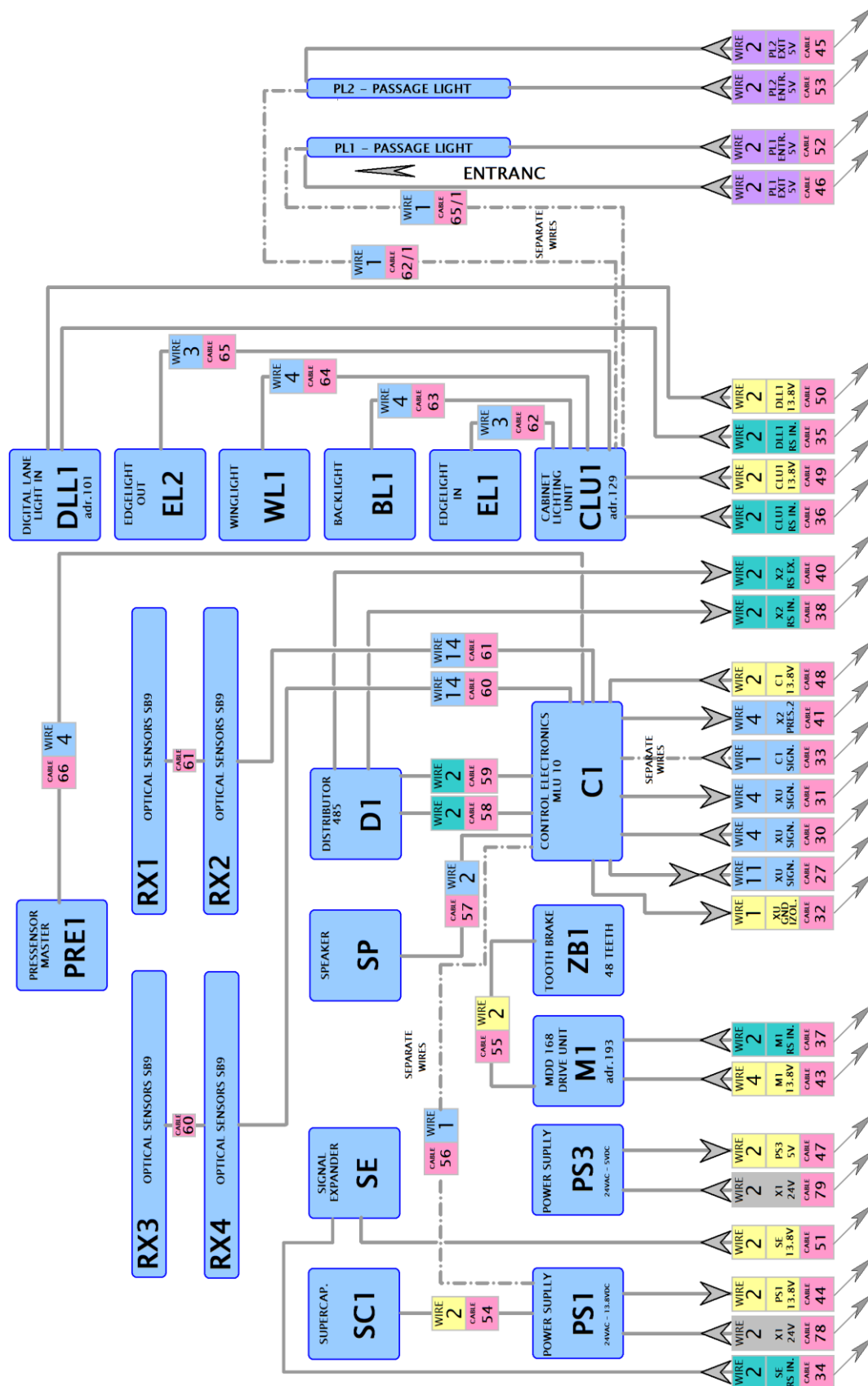
9.3.6. SLAVE wiring diagram (230VAC)

9.3.7. MASTER cables specification card (230VAC)

CABLE	Cable type	CABLE	Cable type	CABLE	Cable type
01	LICY 10x0,5	44	CYH 2x1,5	63	LiYY4x0,25
02	CYSY 2x2,5	45	CYH 2x0,5	64	LiYY4x0,25
03	H07V-K 1x4 PE	46	CYH 2x0,5	65	LiYY3x0,5
27	LiYY 11x0,5	47	CYH 2x1	65/1	LiYV 1x0,5
28	CYH 2x0,35	48	CYH 2x1	66	LiYY 4x0,5
29	CYH 2x0,35	49	CYH 2x1	67	H07V-K1x2,5 PE
30	LiYY 4x0,5	50	CYH 2x0,5	68	H07V-K1x2,5 PE
31	LiYY4x0,5	51	CYH 2x0,5	69	H07V-K1x2,5 PE
32	LiYV 1x0,5	52	CYH 2x0,5	70	H07V-K1x2,5 PE
33	LiYV 1x0,5	53	CYH 2x0,5	71	H07V-K1x2,5
34	CYH 2x0,35	54	CYH 2x1	72	H07V-K1x2,5
35	CYH 2x0,35	55	CYH 2x1	73	H07V-K1x2,5
36	CYH 2x0,35	56	LiYV 1x0,5	74	H07V-K1x2,5
37	CYH 2x0,35	57	LiYY2x0,25	75	H07V-K1x2,5
38	CYH 2x0,35	58	CYH 2x0,35	76	H07V-K1x2,5
39	CYH 2x0,35	59	CYH 2x0,35	77	H07V-K1x2,5
40	CYH 2x0,35	60	28AWG x14	78	CYH 2x2,5
41	LiYY 4x0,5	61	28AWG x14	79	CYH 2x2,5
42	CYH 2x2,5	62	LiYY3x0,5		
43	OBO 500 4x1	62/1	LiYV 1x0,5		

9.3.8. SLAVE cables specification card (230VAC)

CABLE		CABLE	
01	LICY 6x0,5	18	CYH 2x0,5
02	CYSY 2x2,5	19	CYH 2x1
3	LiYY 3x0,5	20	CYH 2x1
4	CYH 2x0,35	21	LiYY 3x0,5
5	CYH 2x0,35	22	LiYY 3x0,5
6	CYH 2x0,35	22/1	LiYV 1x0,5
7	LiYY 4x0,5	23	LiYY 4x0,25
8	CYH 2x2,5	24	LiYY 4x0,25
9	CYH 2x2,5	25	LiYY 3x0,5
10	OBO 500 4x1	25/1	LiYV 1x0,5
11	CYH 2x1,5		
12	CYH 2x0,5		
13	CYH 2x0,5		
14	CYH 2x1,5		
15	CYH 2x1		
16	CYH 2x1		
17	CYH 2x0,5		

9.3.9. Cable colour markings (230VAC)

⬛ (grey)	24V AC : X1 – PS1+PS3 24V AC : X3 – PS2+PS4
⬛ (cyan)	RS 485: X2 – INT.EXT. RS 485: X3 – INT.EXT.
🟥 (red)	24V AC : X1
🟨 (yellow)	13.8V DC: X2 – COMPONENTS 13.8V DC: X3 – COMPONENTS
🟦 (light blue)	SIGNAL: X2 – COMPONENTS SIGNAL: X3 – COMPONENTS

9.4. WIRING DIAGRAM OF TURNSTILE WITH 24VAC POWER SUPPLY

9.4.1. Wiring diagram of the turnstile power supply (24VAC)

9.4.2. Wiring diagram of the X2 MASTER interconnecting terminal block (24VAC)
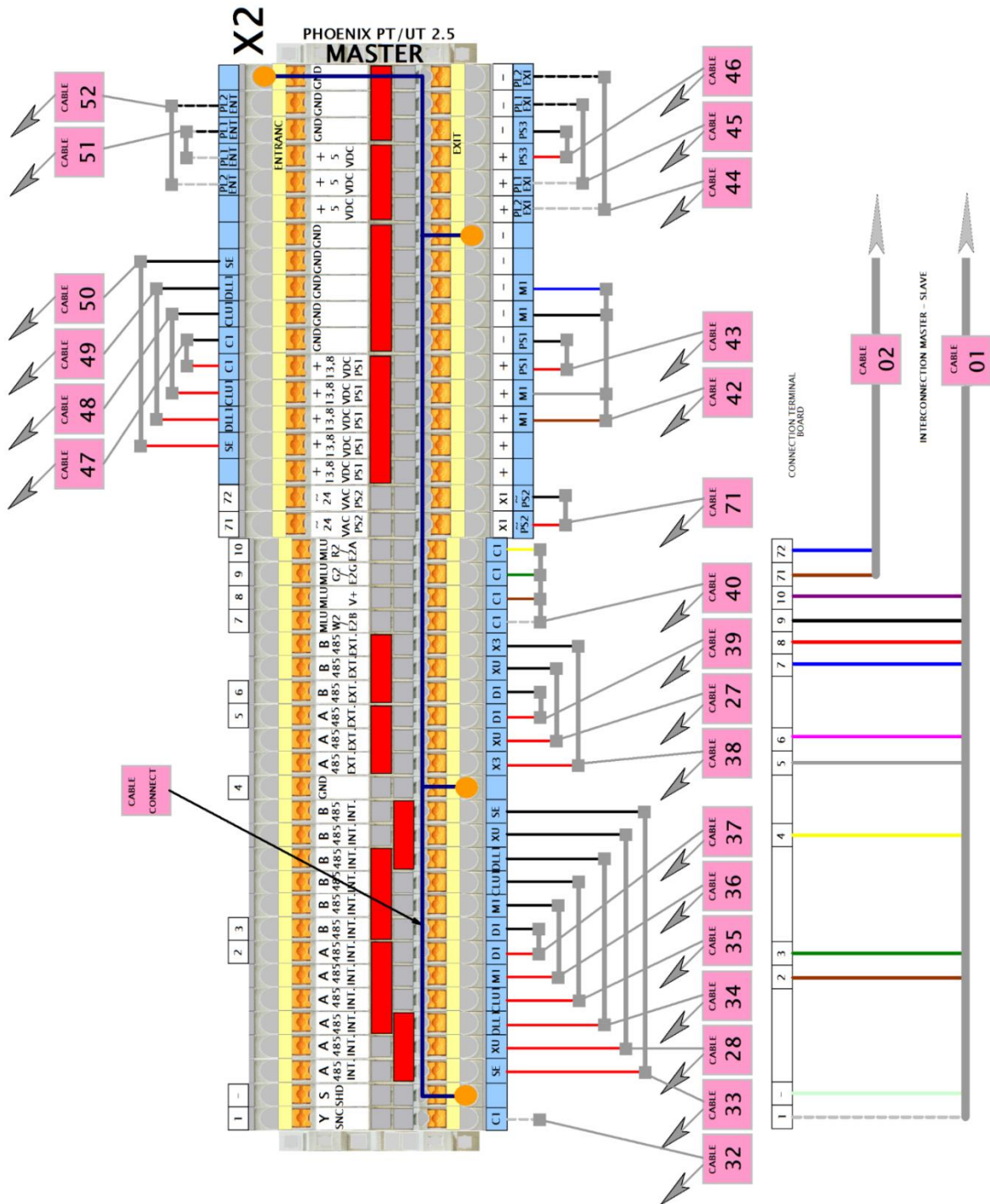
Note:
Cable 39 is only used in the MIDDLE turnstile to interconnect the internal RS485 DATA INT communication line between MASTER terminal X2 and SLAVE terminal X3 of the preceding passage.
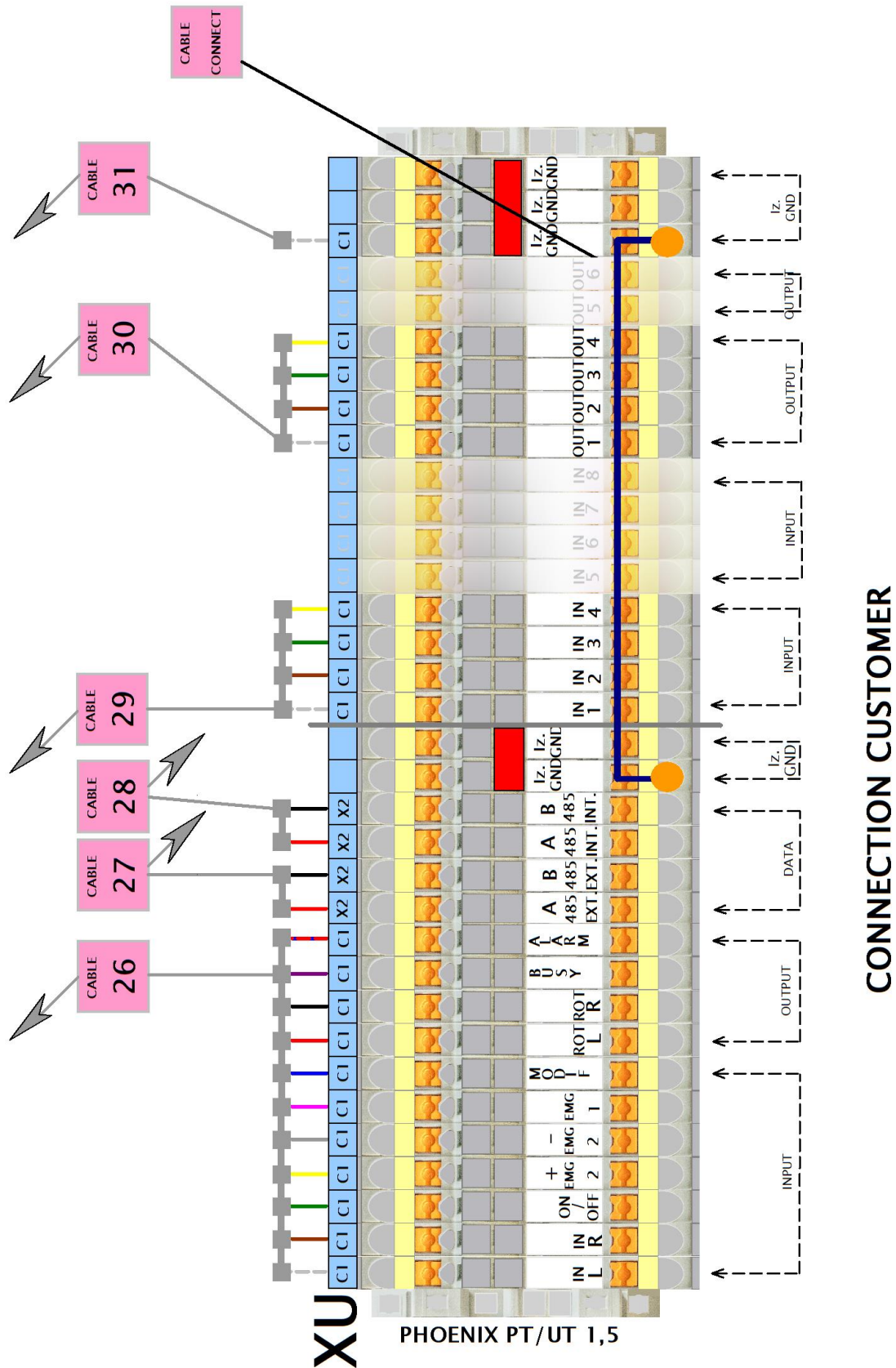
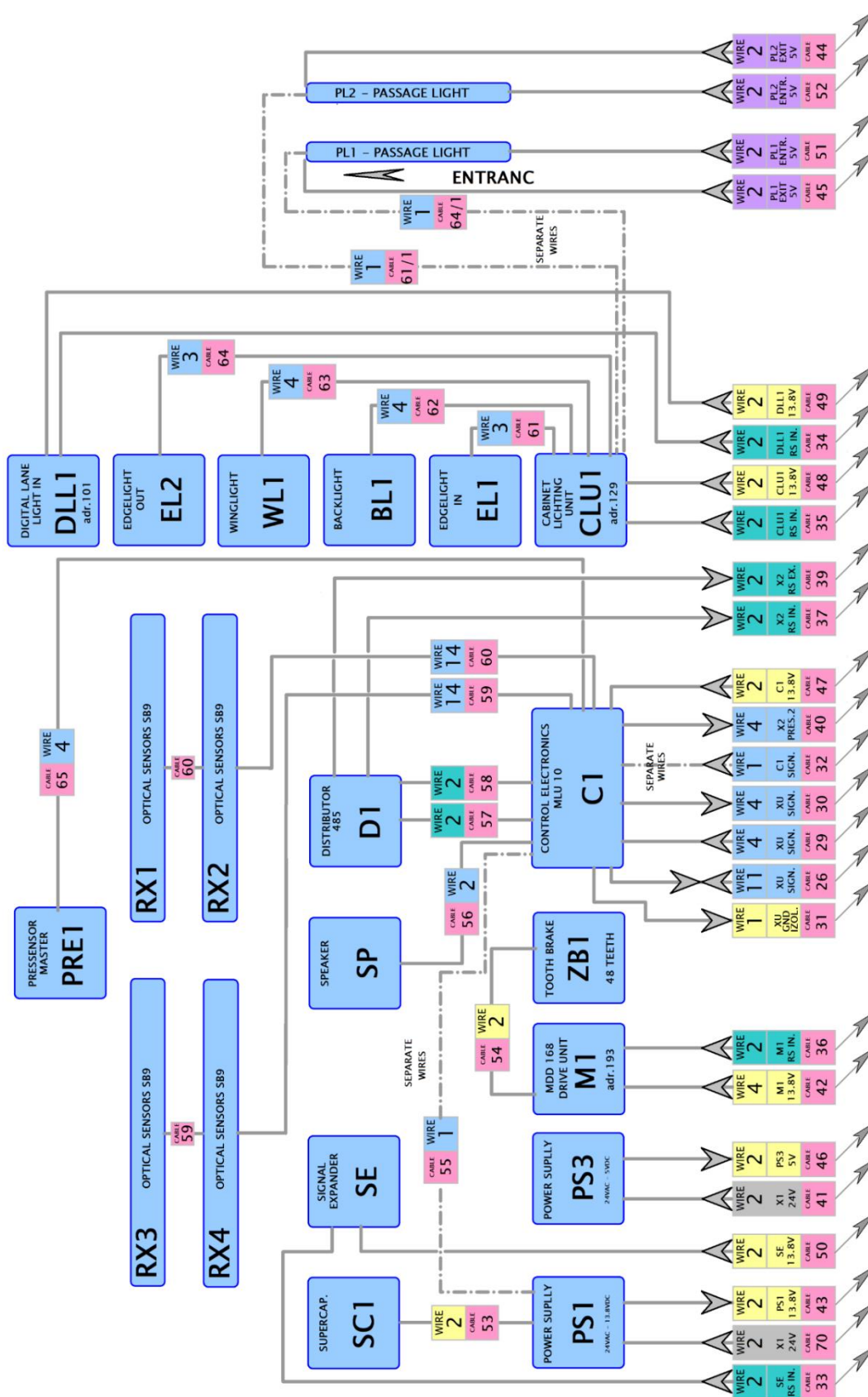### 9.4.3. Wiring diagram of the X3 SLAVE interconnecting terminal block (24VAC)
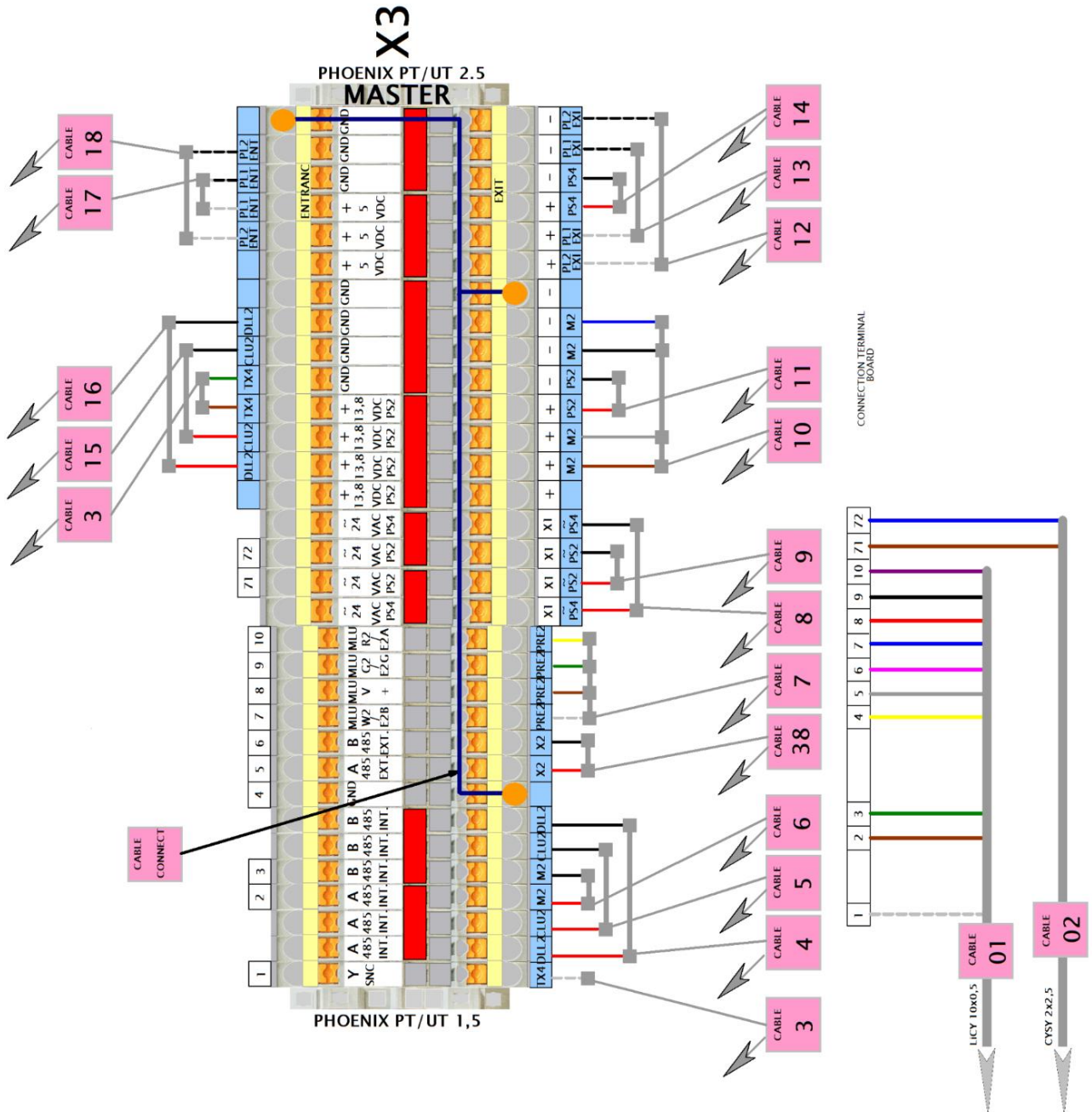
Note:
Cable 39 is only used in the MIDDLE turnstile to interconnect the internal RS485 DATA INT communication line between SLAVE terminal X3 and MASTER terminal X2 of the following passage.
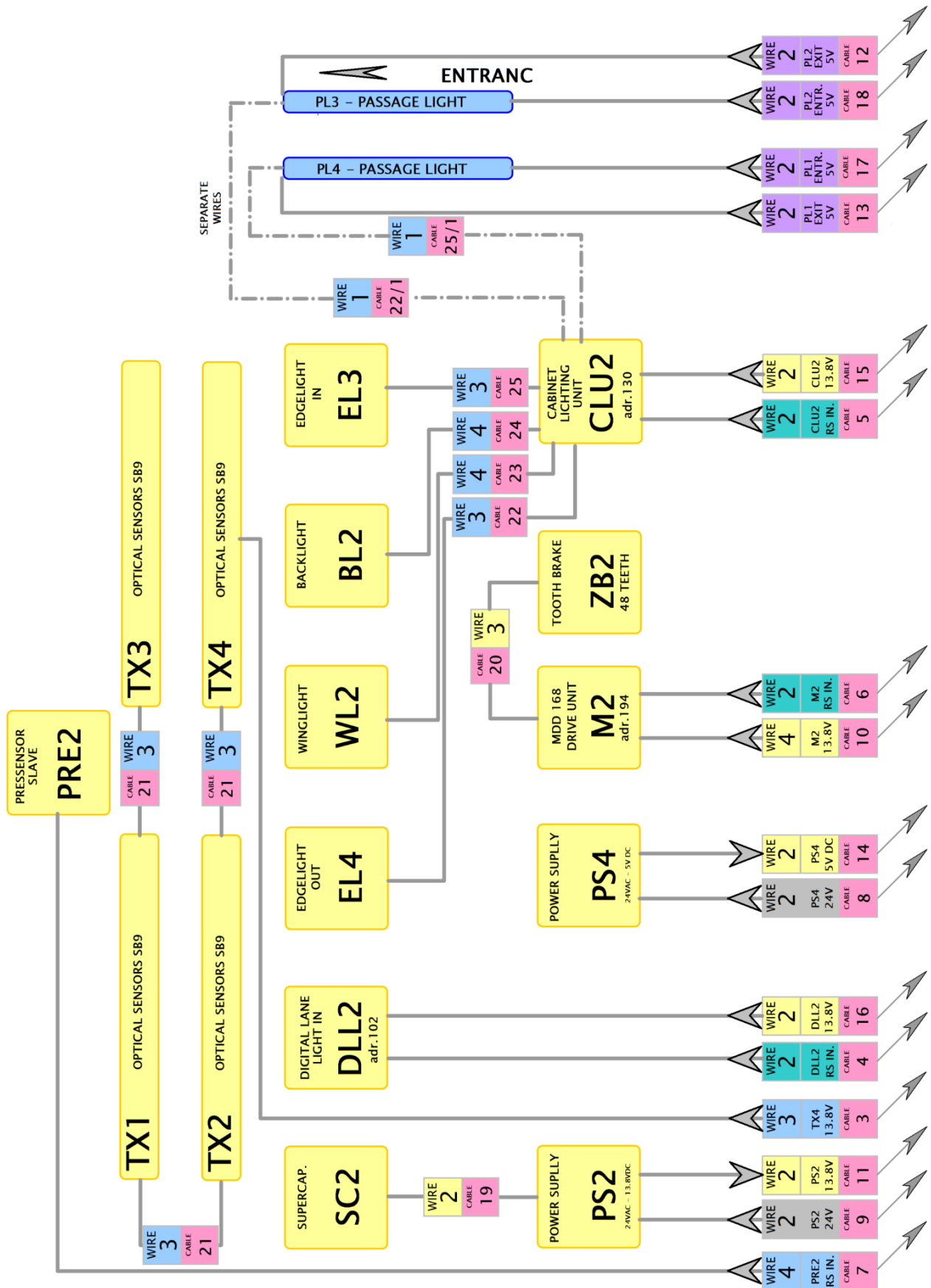
9.4.4. Wiring diagram of the XU user terminal block (24VAC)

9.4.5. MASTER wiring diagram (24VAC)

9.4.6. SLAVE wiring diagram (24VAC)

9.4.7. MASTER cables specification card (24VAC)

CABLE		CABLE		CABLE	
01	LICY 10x0,5	44	CYH 2x0,5	63	LiYY4x0,25
02	CYSY 2x2,5	45	CYH 2x0,5	64	LiYY3x0,5
26	LiYY 11x0,5	46	CYH 2x1	64/1	LiYV 1x0,5
27	CYH 2x0,35	47	CYH 2x1	65	LiYY 4x0,5
28	CYH 2x0,35	48	CYH 2x1	66	H07V-K1x2,5
29	LiYY 4x0,5	49	CYH 2x0,5	67	H07V-K1x2,5
30	LiYY4x0,5	50	CYH 2x0,5	68	CYH 2x2,5
31	LiYV 1x0,5	51	CYH 2x0,5	69	CYH 2x2,5
32	LiYV 1x0,5	52	CYH 2x0,5	70	CYH 2x2,5
33	CYH 2x0,35	53	CYH 2x1	71	CYH 2x2,5
34	CYH 2x0,35	54	CYH 2x1		
35	CYH 2x0,35	55	LiYV 1x0,5		
36	CYH 2x0,35	56	LiYY2x0,25		
37	CYH 2x0,35	57	CYH 2x0,35		
38	CYH 2x0,35	58	CYH 2x0,35		
39	CYH 2x0,35	59	28AWG x14		
40	LiYY 4x0,5	60	28AWG x14		
41	CYH 2x2,5	61	LiYY3x0,5		
42	OBO 500 4x1	61/1	LiYV 1x0,5		
43	CYH 2x1,5	62	LiYY4x0,25		

9.4.8. SLAVE cables specification card (24VAC)

CABLE		CABLE	
01	LICY 6x0,5	18	CYH 2x0,5
02	CYSY 2x2,5	19	CYH 2x1
3	LiYY 3x0,5	20	CYH 2x1
4	CYH 2x0,35	21	LiYY 3x0,5
5	CYH 2x0,35	22	LiYY 3x0,5
6	CYH 2x0,35	22/1	LiYV 1x0,5
7	LiYY 4x0,5	23	LiYY 4x0,25
8	CYH 2x2,5	24	LiYY 4x0,25
9	CYH 2x2,5	25	LiYY 3x0,5
10	OBO 500 4x1	25/1	LiYV 1x0,5
11	CYH 2x1,5		
12	CYH 2x0,5		
13	CYH 2x0,5		
14	CYH 2x1,5		
15	CYH 2x1		
16	CYH 2x1		
17	CYH 2x0,5		

9.4.9. Cable colour markings (24VAC)

⬛ (grey)	24V AC : X1 – PS1+PS3 24V AC : X3 – PS2+PS4
⬛ (teal)	RS 485: X2 – INT.EXT. RS 485: X3 – INT.EXT.
🟥 (red)	24V AC : X1
🟨 (yellow)	13.8V DC: X2 – COMPONENTS 13.8V DC: X3 – COMPONENTS
🟦 (light blue)	SIGNAL: X2 – COMPONENTS SIGNAL: X3 – COMPONENTS

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