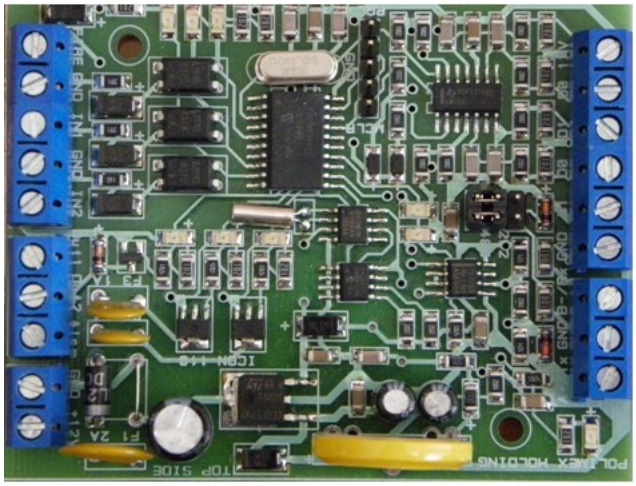
iCON 110

Intelligent Access Control
Controller



Content

1. Safety instructions

Please follow the instructions. This will prevent damage to the technical equipment and ensure the security of users

- Use AC 220V. Do not connect the power cord to the device while plugged into the power outlet. Do not remove the device from the original box. It has power conductors and parts with life-threatening voltage
- If you notice white smoke or burning smell immediately disconnect the power cable
- Do not install the device in dusty and humid room without taking necessary measures
- Follow the temperature requirements for normal operation of the device
- Keep away from water and direct sunlight
- If relocation of input and output cables is necessary disconnect the power cable of the device
- Do not attempt to repair the device on your own in case of malfunction
- Do not clean the product with water or chemicals such as gasoline and other strong chemicals
- No matter how familiar you are with technical equipment, always check the label next to the socket before connecting a cable
- If you have questions please first check the instructions and if you cannot find a solution for your problem contact an employee of "Polimex Holding."

2. Key Features

The Intelligent Controller iCON110 for single door/two directions or two doors/single direction management. Capacity to store up to 1500 users and 4000 events. Two Wiegand 26,34bit inputs in one of these modes: card, PIN, card or PIN and card with work code .Two inputs for exit buttons, one emergency input for fire alarm, The controller can work in standalone(master card or RS232) or network mode via RS485. All settings are made by specialized software produced by Polimex Holding Ltd.

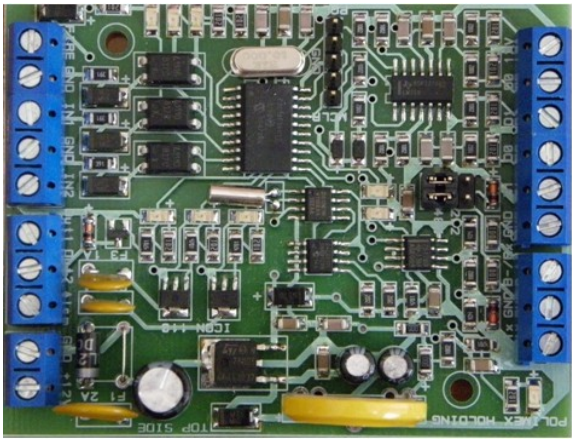
3. Main Properties

Intelligent Single or Double Door Access Controller Panel;
Dynamic Control of Memory up to 1 500 Users / up to 4 000 Event Buffers ;
Independent 3 Inputs and 2 OC Outputs;
Standalone / Network Communication via RS232, RS485 (Max.128ch) ;
2 Reader Ports;
Communication Status via LED Indicator ;
Remain ID & Event Data and Setting Value in case of Electric Outage

4. Specifications

CPU	1 microprocessor
Memory	Program memory: 16 KBytes Flash Data memory: 256 bytes E2PROM
User capacity	1500
Event capacity	4000
Readers	2 inputs for readers: 26 or 34 bit WIEGAND (automatic detection) and 4-8 bit numbers for PIN
Inputs	2 galvanically isolated, 1 lines for alarm modules,
Outputs	2ea (2 ОС изхода-30V/0.5A,
Comunication	RS 232 C, RS 485
Power supply	12 VDC
Working amperage (mA)	60
Led indicator	Yes
Operating temperature	-10°C - +50°C
Operating humidity (RH)	10 % - 90 %RH (not condensing)
Size	80*63*22
Warranty (years)	2
Software	Free and Paid

5. Review Of Standard Components Included



6. Product Review

Standalone Mode
Controller iCON110 can control one door double sided or two doors single sided. The controller has two readers and upon card reading opens a door or not depending on access rights of the respective card.
When registering an input or output event (from the reader or exit button) controller generates a corresponding event record (Access Granted / Access Denied). All events are recorded in memory and in the presence of a communication link are sent to specialized management software.

Working With Computer Control
All activities associated with the controller settings, settings of relays, time schedules, adding and deleting cards, event management, etc., can be done by computer. Each event sent from the controller to a computer is stored in a database for flexible control of user rights.

Data Retention
Interruption of power supply controller and user event data are stored in nonvolatile memory.

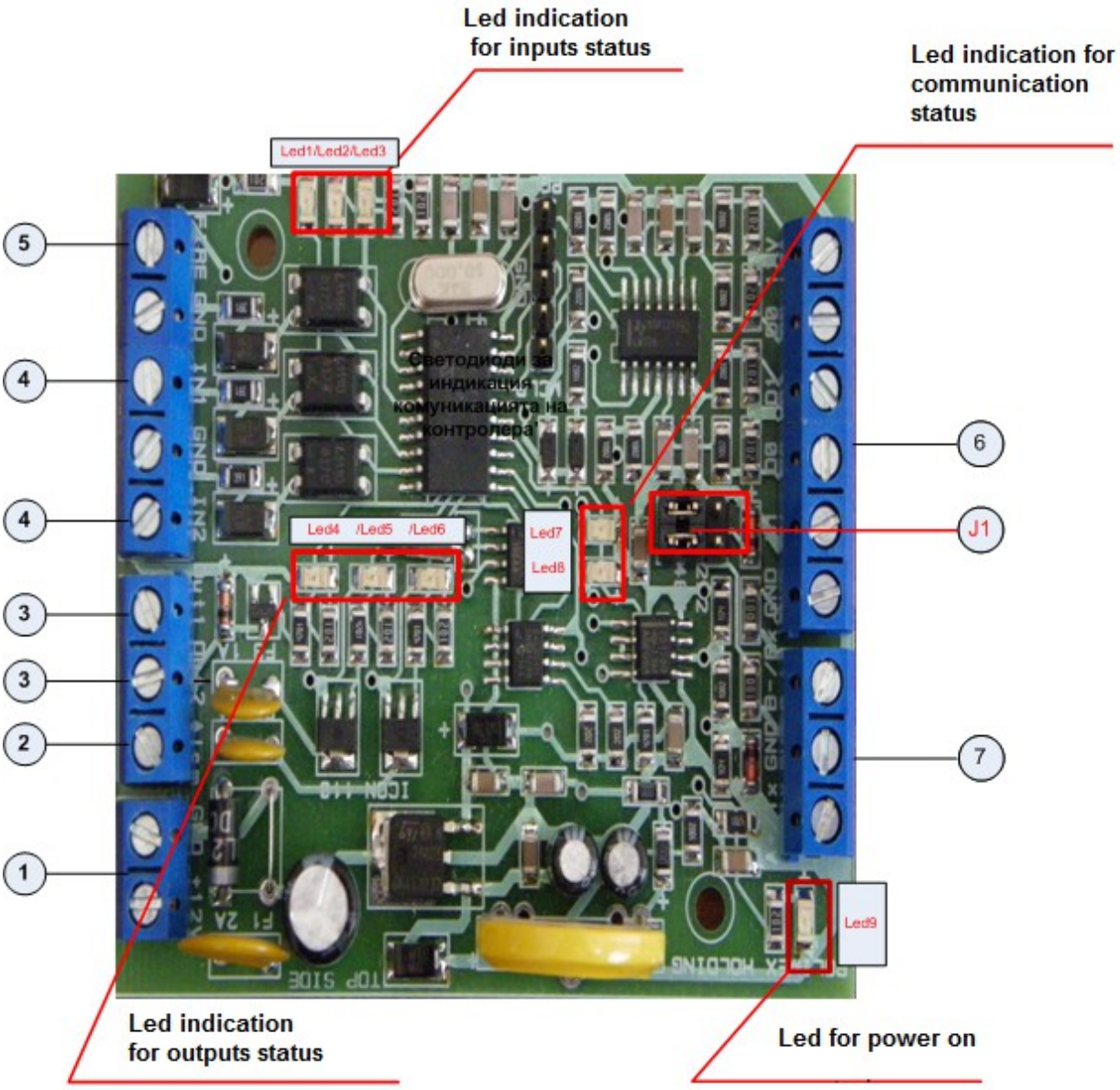
Number of Controlled Doors
The iCON110 can control one door double sided or two doors single sided.

Inputs
The controller has 2 inputs for button "Exit", emergency fire input which are programmable via the software.

Outputs
The controller has 2 OC outputs (30V/0.5A), which are programmable via the software (NO or NC – the output is GND)

Time Schedules
The system has 8 time schedules. Each time schedules can be set up with 4 intervals per day. It can be used for 24 hour , **week by week control.**

Holiday Time Schedules
The system has 8 time schedules for holidays where you can add dates of holidays for the current year.



Picture 1. Main view

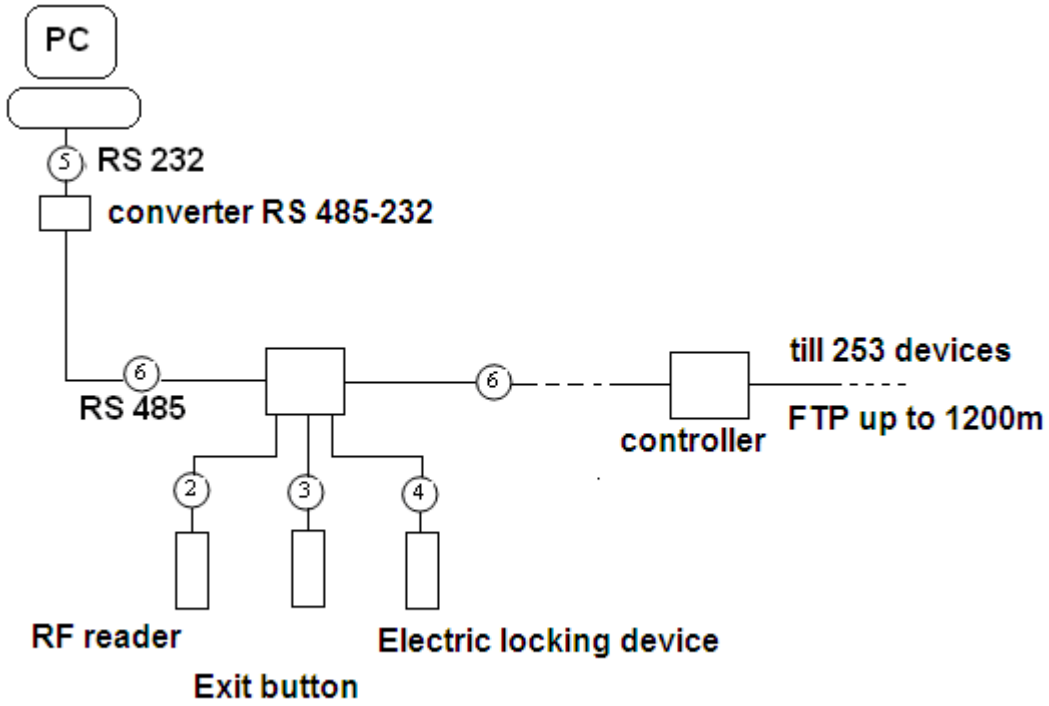
1. Connector for power supply 12 V DC.
2. Connector for reader's Led control when using master card
3. Connector for locking devices or relay , controlled by NO or NC contact
4. Connector for exit buttons and sensors , selectable NO or NC via software.
5. Connector for emergency signal from other system,(for example fire alarm system) Signal must be dry contact to GND.
6. Connector for two readers (26 or 34 bit WIEGAND).
7. Connector for communication cable RS-485 or RS-432

7. Types Of Installations And Check Points

7.1.Items To Check Before Installation

7.1.1.Choice Of Cable

Example wiring:



Picture 2. Example wiring

7.1.2.Recommended Cable Lengths And Restrictions:

	Description	Specification of cable	Maximum length
1	AC power	2x 0.5 мм	
2	Reader - power and data	22 AWG 4 conductor shielded	150м (depends of the reader)
3	Door Contact Exit Button Sensor Input	22 AWG 4 conductor shielded	300 м
4	Door Lock, Alarm Device , Lock (Alarm)	18 AWG 2 conductor unshielded	300 м
5	RS 232 cable	24 AWG 2 twisted pair shielded	15 м
6	RS 485 cable	24 AWG 2 twisted pair shielded	1200 м

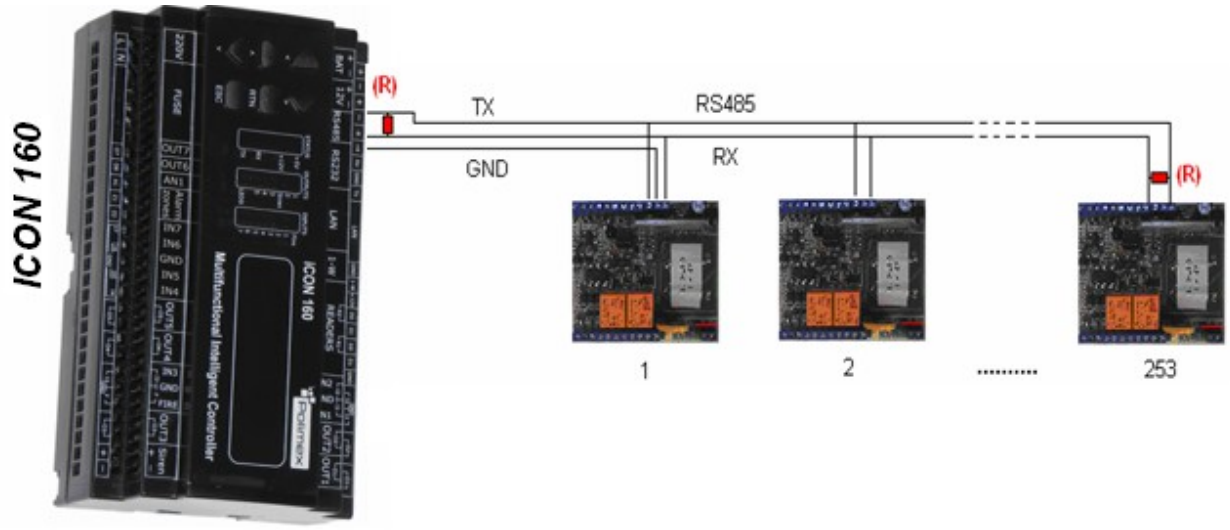
7.2.Check Points During The Installation

7.2.1Terminating Resistors

Termination of the communication bus is necessary and is recommended especially for longer trunks. The aim is to reduce the level of noise due to the communication bus, which get a stable operating system.

- For trunks up to 50m length use a 1 kilo-ohm resistor.
- For buses to 150m length use a 620 ohm resistor.
- For rails over 150m length use a 300 ohm resistor.

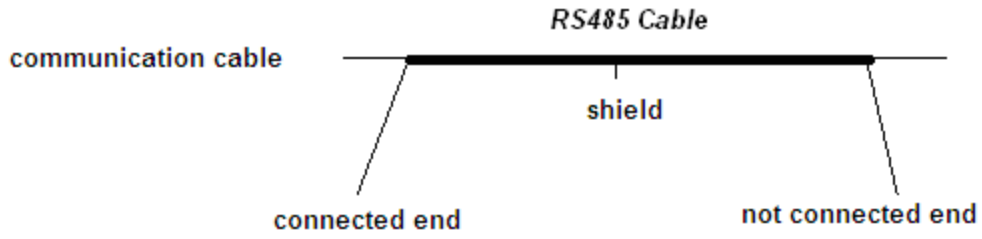
How To Connect The Terminating Resistors



Picture 5. How to connect the terminating resistors

7.2.2.Grounding: Recommendations

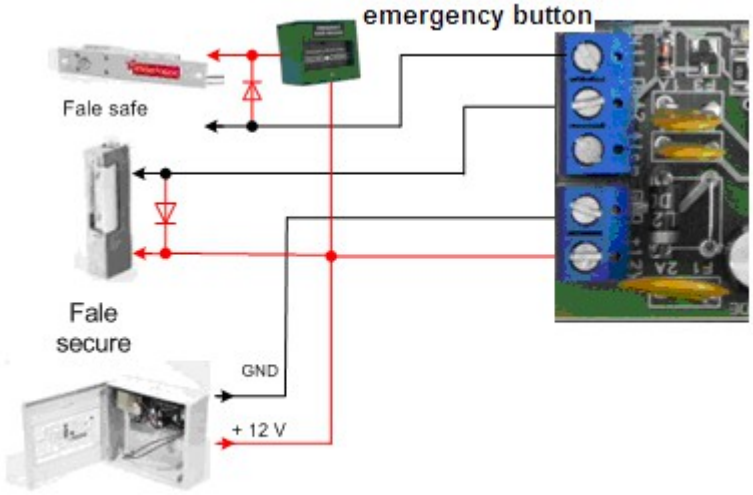
We recommend using a properly constructed system of ground communication lines. Basically there are three grounding points that users can find during installation:
1) Grounding in the soil
2) Grounding in the communication equipment chassis
3) Power grounding
It is important to note that you should not connect both ends of the shielding of communication cables to the grounding system. If this is done, some stray currents can appear when there is a difference in the levels of tension at both ends of the communication cable. Stray current flow will introduce noise and errors in communication respectively.
For proper grounding only one end of the shielding (screens) of the communication cables should be grounded. If soil grounding is available connect one end of the shield (screen) to this grounding. If soil grounding is not available, one end of the shielding (screens) of the communication cables should be connected to the chassis grounding of the communication equipment. If you do not find the first two groundings (soil or chassis), connect the end of the grounding wire to the GND of the controller.
It should be noted that if the grounding of the chassis **is not made** properly it would lead to noise and errors in communication. Then it is better to make a grounding to the GND controller.



Picture 4. Grounding

7.2.3.Connecting The Protective Reverse Diode

If you connect to an inductive locking mechanisms to the output relays, these mechanisms will induce high voltages when switched on and off. If users do not connect protective diodes, dangerously high voltage will return to the controller and will damage it. Therefore we strongly recommend protective diodes to be connected to absorb dangerous induced voltage



Picture 5. Connecting the protective reverse diode

- Always mind the way of connecting the devices and never forget the protective reverse diode. Otherwise the controller can be damaged!

8.Installation

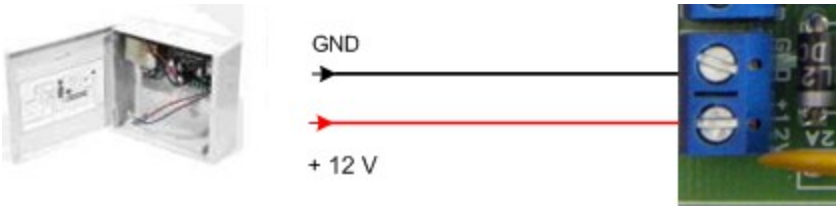
8.1.Determining The ID Of The Device

When connected via RS 232 or RS 485, each controller is represented by ID number that can be changed by software. Within one communication bus you should not have controllers with the same ID number.

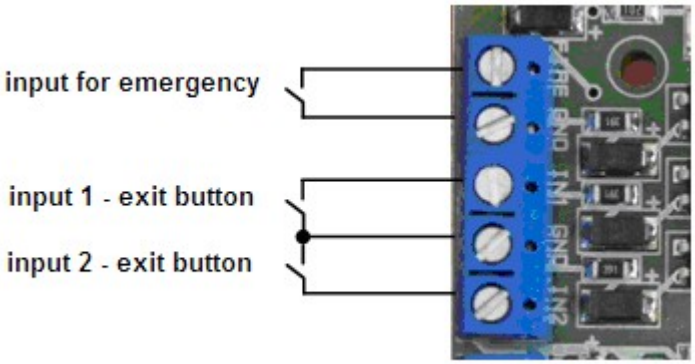
- When connecting more then one controller via RS485 don't forget to check devices IDs. They must not be repeated , otherwise you will receive comminication errors.

8.2.Power Supply

Connect double wire for 12V DC to connector with sign GND и +12V.



Picture 6. Power SupplyConnecting The Inputs Of The Controller.



Picture 7. Connecting the inputs of the controller

Connecting the EXIT buttons (input # 1, input # 2)

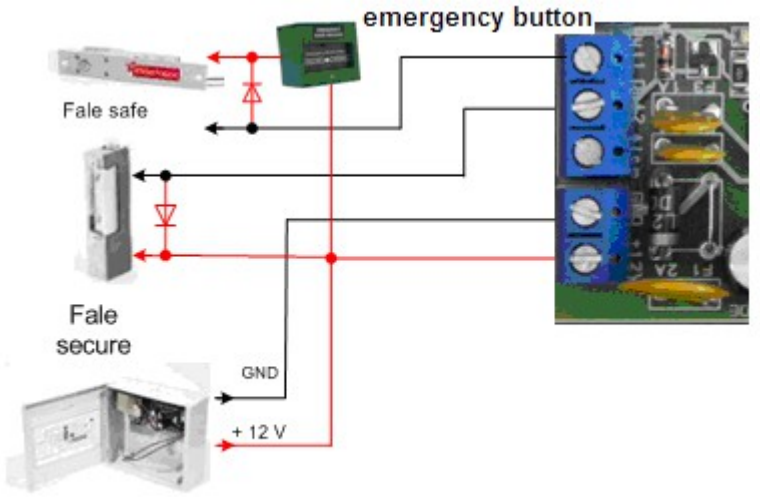
- ✓ Connect one wire from the EXIT button (button out) to input #1 for Door #1 respectively input #3 for Door #2 and the other wire from the EXIT button to GND.
- ✓ Connecting to the emergency input - Signal must be dry contact to GND.

SUMMARY for connecting the inputs to the corresponding doors

- Control of one door - Door #1: input # 1 to EXIT buton1, input # 2 to Door contact sensor
- Control of two doors
  - Door #1: input #1 to EXIT buton1, input #2 to Door contact sensor
  - Door #2: input #3 to EXIT buton2, input #4 to Door contact sensor

- Control of one door **- Door 1**: **input # 1** to **EXIT** button 1,
- Control of two doors **- *Door* 1: input # 1** to **EXIT** button 1, **input # 2** to **EXIT** button 2,

· **Connecting The Outputs Of The Controller**



[Picture 8. Connecting the outputs of the controller]

✓ **Connecting an electrical locking device (Power Fail Safe),(*Door 1:Output #1).***

Connect +12V from the power supply to the locking device. Set output #1 to NC contact from the software and connect output (GND) to the fail safe locking deice. It is recommended to use emergency button wit NC contact for the +12V wire which powers the locking device.

- Electrical locking device(Power Fail Safe)-those are devices which are normally open. When you power the device with 12VDC device passes to closed position. For example electric drop bolt, electric magnet, electric strike fail safe type.
- Connecting an electrical locking device (Power Fail Secure), *(Door 2:Output #2)*
- Connect +12V from the power supply to the locking device. Set output #2 to NO contact from the software and connect output (GND) to the fail secure locking deice.
- Electrical locking device (**Power Fail Secure)-** those are devices which are normally closed. When you power the device with 12VDC device passes to open position. For example electric drop bolt secure, electric strike fail secure type.

✓ **Summary for connecting outputs to locking devices.**

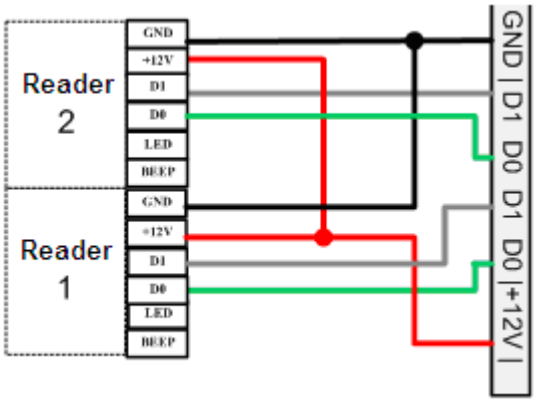
· ***Access control for 1 door / Door 1*:Output #1** to locking device

· ***Access control for 2 doors / Door 1*:Output #1** to locking device , **Door 2: Output #2** to locking device

· Don't forget to keep the right method of connecting locking devices

· Don't forget the fire safety for each door – Always use fail safe locking device with emergency button when controlling a double sided door.

8.2.4.Connecting readers to the controller.



Picture 9. Connecting readers

Example for reader connections

- Connect (+) wire from reader to **+12 V** connector of controller
- Connect (-) wire from reader to **GND** connector of controller
- Connect **Data 0** wire from reader to **D0** connector of controller
- Connect **Data 1** wire from reader to **D1** connector of controller
  - ✓ **Summary for connecting readers**
- ***Access control for 1 door single sided*** :**Reader# 1** for ***Door 1*** , **EXIT** button 1 for exit Door 1
- ***Access control for 1 door double sided*** :**Reader# 1** and **Reader#** 2 for **Door 1**, input 1 for exit Door 1,
- ***Access control for 2 door single sided :Reader# 1 for Door 1 and Reader# 2 for Door 2, input 1 for exit Door 1, input 2 for exit Door 2.***

9.Communication With The Controller

9.1.Communication Over The RS232 Port

This is the mode where you can communicate simultaneously with only one controller per port with a free or paid software.

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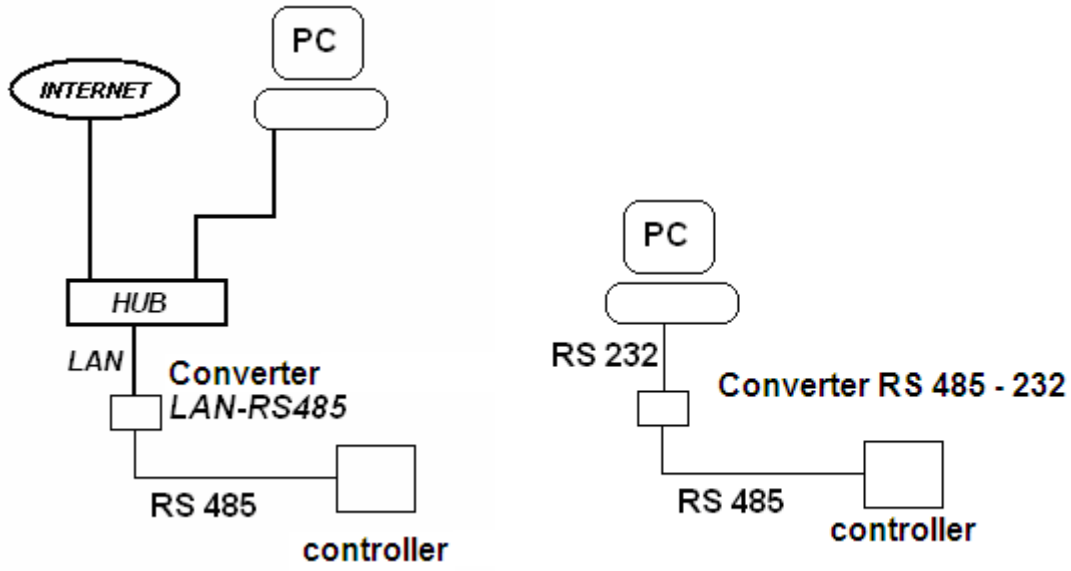
Picture 13. Connecting over RS232

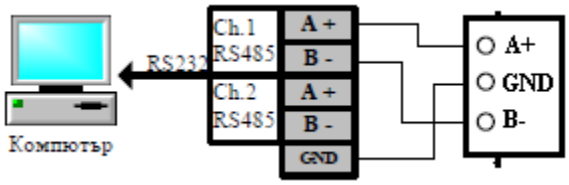
A standard COM port connector with 9 pins is used for connection to your computer. The figure indicates which of the pins are connected to make communication. These are number 2,3 and 5. Plug the COM port connector into the COM port of the computer. If your computer is not equiped with a standard COM port you can use a USB to Com converter. Once you are done with the above mentioned preparations you can supply 220 V AC power to the controller. Plug and socket communication on the computer. Install and run AndromedaTool.exe

9.2.Communication Over The RS485 Port

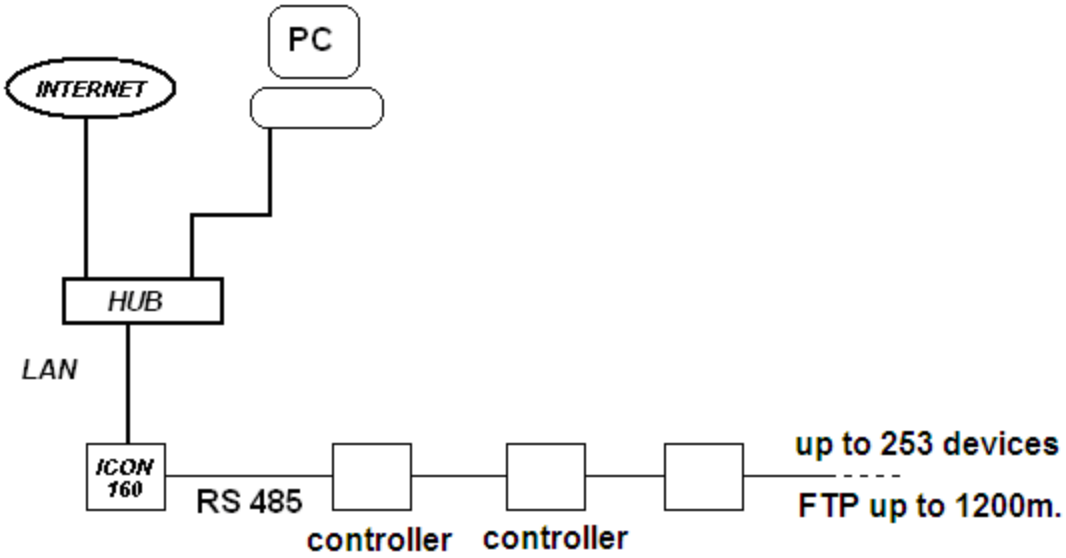


Picture 11. Connecting over RS485

This is the mode where you can communicate simultaneously with more than one controller per port with a free or paid software.
You need a RS485 to RS232 or Ethernet converter since most computers do not have a RS485 port. A twisted pair cable is mandatory for this kind of communication (UTP or FTP for example).



От Host PC to LAN to 485



Host PC >RS232>ICON110

Host PC >Convertor RS232-RS485>ICON110

Host PC >Convertor RS232-RS485>ICON110.....253 devices with RS485

10.Led status of the system

Led №	Condition of:	Mask for inputs and outputs	
		NO (нормално отворен)	NC (нормално затворен)
Led 1	Exit button 2(In2)	ON.	OFF.
Led 2	Exit button1(In1)	ON.	OFF.
Led 3	Emergency input	ON.	X
Led 4	When marking master card	Fast blink and establishment	X
Led 5	Activating Out1	ON.	OFF.
Led 6	Activating Out2	ON.	OFF.
Led 7	Communication status Rx	Fast blink	X
Led 8	Communication status Tx	Fast blink	X
Led 9	Power on U	ON.	X

Picture 13 LED status

11.Controller modes

11.1.Normal mode

- ✓ **Power on**

Led 9 will start on

- ✓ **Normal mode is when you are using the controller for one or two doors via software Andromeda Tool or Pro. These softwares are used for setting the controller, user management, time and attendance and lots of other functions.**

11.2.Master card mode

In this mode card no software for card management is used. Instead of a software a master card is used for management. The first card read by the controller becomes the master card in this mode. With the master card you can add a card, remove a card or remove all cards. The LCD display is indicating actions and progress for each action. To activate this mode check the MASTER CARD checkbox and apply settings by pressing OK.

Adding a card

After checking the master card on a reader the display shows MASTER CARD MODE.ADD CARD. Wait for the display to show EXECUTE ADD CARD. The controller is now in the automatic add card mode. Check all cards you want to have access rights for this reader. The controller returns to normal mode after 5 seconds of inactivity.

Deleting a card

After checking the master card two times on a reader the display shows MASTER CARD MODE.REMOVE CARD. Wait for the display to show EXECUTE REMOVE CARD. The controller is now in the

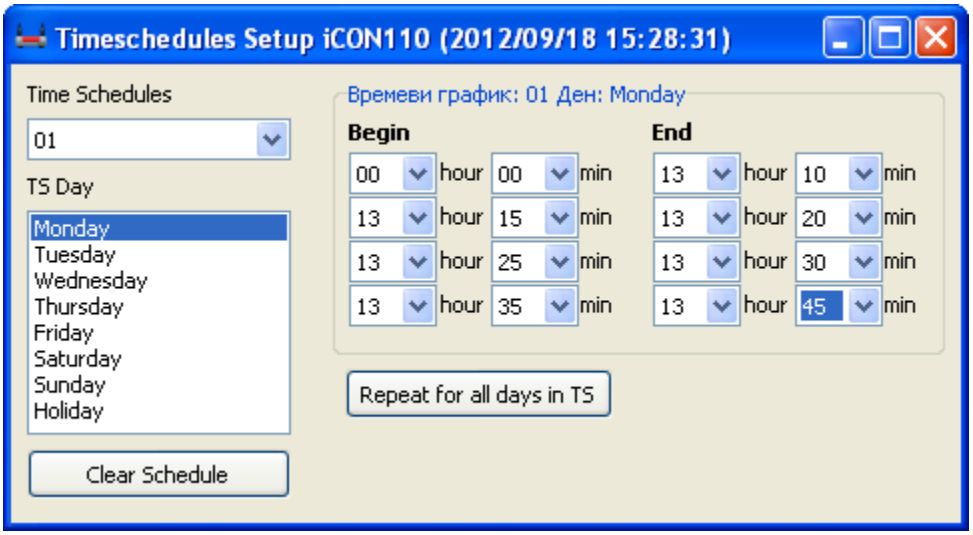
automatic remove card mode. Check all cards you want to remove access rights for this reader. The controller returns to normal mode after 5 seconds of inactivity.

11.3.Deleting all cards

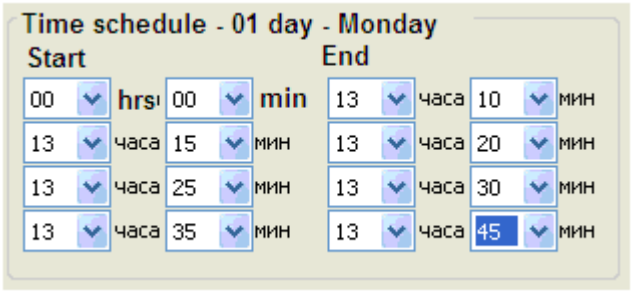
After checking the master card four times on a reader the display shows REMOVE ALL CARDS. Wait for the display to return to normal mode. All cards are removed.

12.Time Schedules

Time schedules are intervals for timed output or card access rights management. There are four available intervals per day and eight available time schedules per controller. When time schedule 0 is selected for a card the according card has rights 24/7. When time schedule 0 is selected for an output the according output stays in the predefined default mode, NC respectively NO 24/7 until an event changes the state.



This is a sample interval for Time Schedule 01 for Monday which can be used for an output or card.
Cards with this Time Schedule will have access rights only from 13:00 to 20:00 on every Monday.
If this Time Schedule is used for output scheduling, then the output will be triggered from 13:00 to 20:00 on every Monday (respectively the door will be unlocked in this time interval).



13.Appendix

a. A) Default settings for inputs and outputs for two doors (one sided) mode

	OUT1	OUT2
R1>DURESS>OK	3	4
R1>DURESS>ERR		4
R2>DURESS>OK		
R2>DURESS>ERR		
R1>CARD>OK	3	
R1>CARD>ERR		4
R1>TIME SH. EN.>OK		4
R1>ANT. PASS E.>OK		4
R2>CARD>OK		
R2>CARD>ERR		
R2>TIME SH. EN.>OK		
R2>ANT. PASS E.>OK		
DOOR1>OVERTIME		4
DOOR2>OVERTIME		
EXIT B.DOOR1(Input#1)	3	
EXIT B.DOOR2(Input#3)		
DOOR1: FORSED OPEN		5
DOOR2: FORSED OPEN		
EMERGEN. INPUT	OPEN	4
Input#1	3	
Input#2		4
Input#3		

b. Settings for inputs and outputs for one doorr (double sided) modeB)

	OUT1	**OUT2**
R1>DURESS>OK	3	4
R1>DURESS>ERR		4
R2>DURESS>OK		
R2>DURESS>ERR		
R1>CARD>OK	3	
R1>CARD>ERR		4
R1>TIME SH. EN.>OK		4
R1>ANT. PASS E.>OK		4
R2>CARD>OK		
R2>CARD>ERR		
R2>TIME SH. EN.>OK		
R2>ANT. PASS E.>OK		
DOOR1>OVERTIME		4
DOOR2>OVERTIME		
EXIT B.DOOR1(Input#1)	3	

EXIT B.DOOR2(Input#3)		
DOOR1: FORSED OPEN		1
DOOR2: FORSED OPEN		
EMERGEN. INPUT	OPEN	4
Input#1	3	
Input#2		4
Input#3		

14.Notes

1. Controller iCON 110 does not support Antipassback function.

For more information please contact us at : sales@securitybulgaria.com or +35929208666