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Pulse AC100 Control Panel Installation Guide
Rev.3.0

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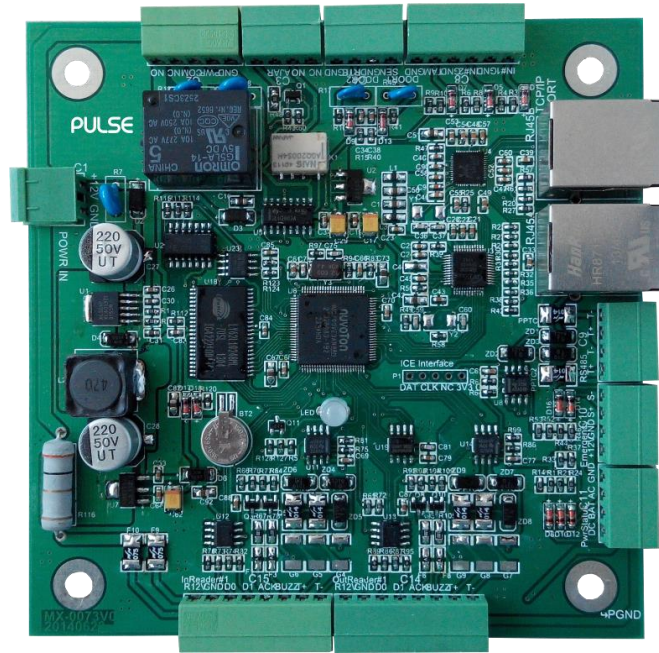
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1. Introduction

This document provides detailed description about the features, functions and setup of AC100 Control Panel.

A. Strength
- Native TCP/IP on board, 10/100Mbps communication speed
- Flexibility structure cabling, cat 5 cable, direct to hub or panel to panel daisy chain wiring.
- Multi-threading program, transactions upload to database server less than 2 sec under 50 panels.
- User defined 128 bits key for the data exchange between AC100 and AC200 door access panel to COM Server, prevent the real data to be snooped and simulated by other network point.
- User defined 128 bits key, scramble RS485 data exchange between AC100 and Ac200 door access panel and Pulse reader, prevent reader data to be snooped and copied.
- Work with I/O module, save the wiring cost and increase the data security (patented design)
- Support 7x card number format, each card number format has 3 x facility code checking
- Work with Pulse LCD reader, display interactive message
- Work with Pulse emergency door open device
- Supervised Monitor of the Door Sensor Input, Prevent trouble close and open

B. Features
- 32 bits microprocessor, 50MHz
- External device short circuit protection
- Thumbed protection
- Recoverable fuse protection.
- Status LED represents operating status
- Auto recover for the TCP/IP failure
- Battery on board for memory retention, 3 years
- Firmware can be on-line upgraded
- Real time clock, less than 1 sec deviation daily.
- Twin card operation (100 couples)
- Anti-passback
- Two door interlock

2. Technical Specification

| Specification	AC100
Panel Inputs	• 1 x IN and 1 x OUT Wigand reader or; • 1 x IN and 1 x OUT ACX scramble RS485 reader • 1 x door sensor input • 1 x request to exit input • 1 x controller box tamper input • 1 x ACX high security key open door device • Work with ACX high security door emergency open device, couple with random key switch & reset panel
Panel Outputs	• 1 x E-Lock relay dry contact output, max. 10A current rating • 1 x Alarm relay dry contact output, max. 3A current rating • 1 x Door ajar TTL signal output, 5VDC output, 20mA • 12.8VDC battery charging
Memory	• 38,000 cardholders, each card holder has 24 bytes content • 45,000 swipe card records • 800 events
PCB Dimension	120mm x 120mm x 12mm
Expansion	1 x RS485 serial port for expansion, software and hardware interface to other system
Holidays	100 Holiday dates
Timezone	• 80 x access control time zone • 1 x password time zone • 1 x electric Lock time zone • 1 x alarm time zone • 1 x door ajar time zone • 1 x request to exit time zone • 1 x twin card operation time zone • All timezone can be assigned from Monday to Sunday and Holiday, 4 intervals per day, time zone can be selected globally or individually

| Password	- User password, timezone control - Global password, key in the password through keypad reader open door - Duress password, open door but trigger alarm output
Communication	- Panel to hub, CAT 5 cable (max. 100 meters) - Panel to panel, daisy chain by CAT 5 cable (max. 100 meters)
No. of Panels	Depends on IP address available
Backup Battery	12VDC, 7AH backup battery, - provide at least 4 hours operation, excludes electric lock power consumption
Operating Voltage	220V, 5A input in AC. 12VDC, 3A output
Operating Temperature	0° to 65° C
Operating humidity	0-95% relative humidity non-condensing
Wiegand Reader	- Communication: Wiegand - Green / Red LED control - Buzzer control - Reader in 6 wires connection - Max. cable length : 150m
Pulse Reader	- Communication : RS485 - High Security scramble data encryption 7 x LED color control - Buzzer Control - Interactive message display for ACX LCD reader - Reader in 4 wires connection - Max. cable length : 1,200m

3. System Deployment

There are three ways to connect panels. All of the panels communicate in TCP/IP protocol with each other. CAT5 cable is used to connect the panel to the (LAN) Local Area Network or connect the panels in Daisy Chain. RS 485 protocol is no longer used for inter-panel communications so that the cost is reduced and the speed is increased. Multi-threading is also used to speed up concurrent operations.
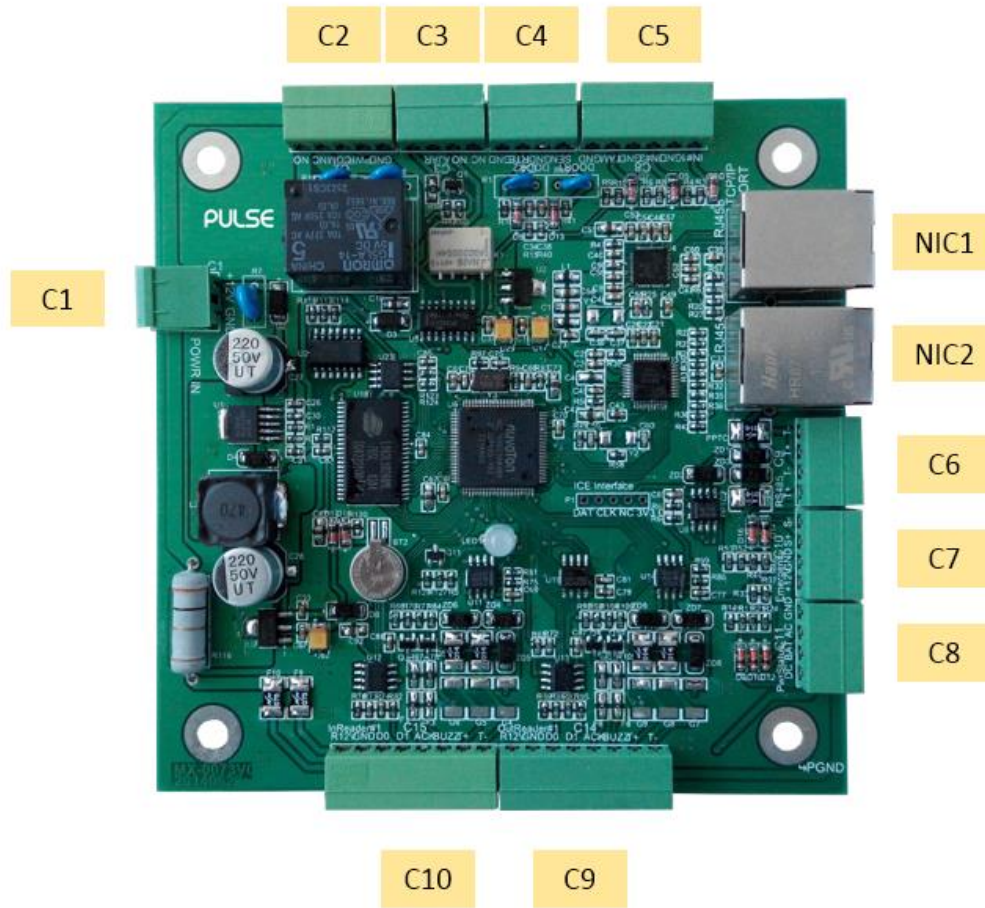
- Pier to Pier
- Pier to Pier + Daisy Chain

Control Panel in TCP/IP Direction Connection
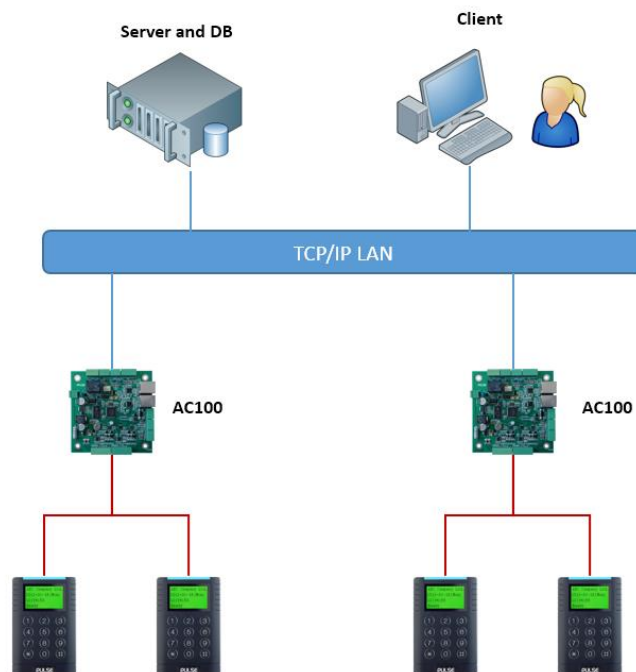
# Control Panel in Daisy Chain and Direct TCP/IP Connection
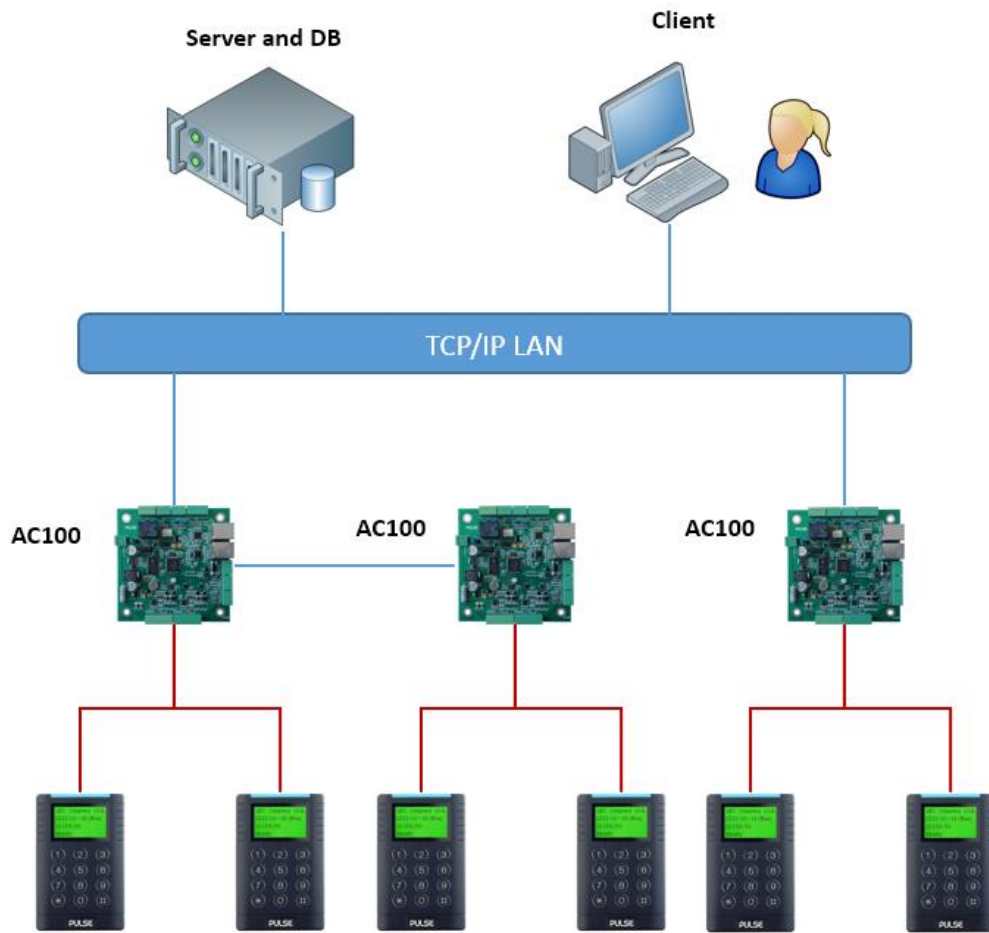
4. Panel Layout

5. Detailed Pin Assignment

Connector	Details	Pin	Description
C1	Power Input	1	12VDC, 3A
		2	Ground
C2	Lock Power (12V, 1.5A)	1	Ground
		2	Power
	Lock Output (Dry Contact)	3	COM
		4	NC
		5	NO
C3	Door Alarm Output (Dry Contact)	1	COM
		2	NC
		3	NO
	Door Ajar Output	4	Normal – 0VDC / Ajar 5VDC,200mA Output
C4	Door Sensor	1	Door Sensor
		2	Ground
	Release Button	3	Release Button
		4	Ground
C5	(Reserved)	1	
		2	
		3	
		4	
	Panel Tamper	5	Tamper
		6	Ground
C6	RS485 Port (Custom Use)	1	RS485 (T+)
		2	RS485 (T-)
		3	RS485 (T+)
		4	RS485 (T-)
C7	Emergency Door Open Device	1	Power Out (12VDC, 100mA)
		2	Ground
		3	Signal +
		4	Signal -
C8	(Reserved)		

| Connector	Details	Pin	Description
C9	OUT Reader	1	Green LED (ACK)
		2	Buzzer
		3	Data 0
		4	Data 1
		5	Reader Power (200mA)
		6	Ground
		7	RS485 (T+)
		8	RS485 (T-)
C10	IN Reader	1	Green LED (ACK)
		2	Buzzer
		3	Data 0
		4	Data 1
		5	Reader Power (200mA)
		6	Ground
		7	RS485 (T+)
		8	RS485 (T-)
NIC	TCP/IP Port	1	TCPIP Network / next control panel
		2	

6. Panel IP Configuration

1. Open "Time Clock TCP/IP Parameter" utility program.
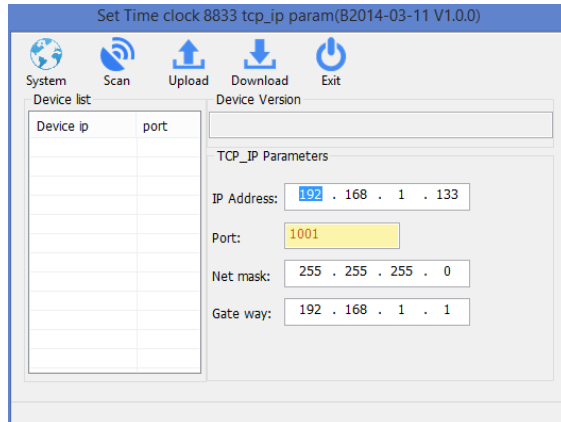
2. Connect 9281 Time Clock to the local network. Click "Scan" button.
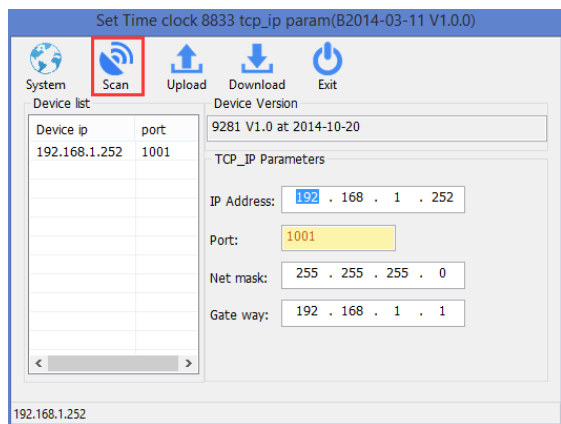
3. Select the device and modify the IP Address or other parameters. Click "Download" button to download configuration to the board.
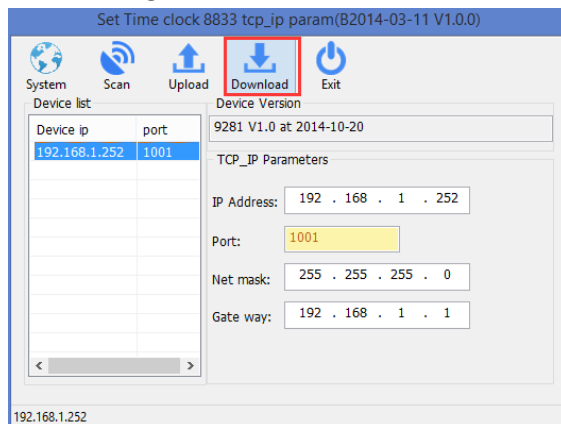
7. Sample Connection Circuits

7.1 – Card Reader

	Wire Color:	Description:
Reader: C9, C10	Orange	Green LED (ACK)
	Yellow	Buzzer
	Green	Data 0
	White	Data 1
	Red	Reader Power
	Black	Ground
	Purple	RS485 (T+)
	Grey	RS485 (T-)

Wiegand Reader	1 2 3 4 5 6 7 8 Wiegand Reader
Pulse Scramble RS485 Reader (Improved Security with Scramble RS485 data Encryption)	1 2 3 4 5 6 7 8 **Pulse** Scramble RS 485 Reader

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7.2 Electrical Lock

Lock: C2	Pin Assignment: 1. Ground 2. Power 3. COM 4. NC 5. NO

Normally Closed with Power on Panel	Normally Open with Power on Panel
Normally Closed with External Power	**Normally Open with External Power**

7.3 Door Alarm (Dry Contact)

Alarm: C3	Pin Assignment: 1. COM 2. NC 3. NO 4. Normal is 0VDC, Door Ajar 5VDC, 20mA output
Normally Open with External Power	
Normally Closed with External Power	

7.4 Door Ajar Output

Door Ajar: C3	Pin Assignment: 1. COM 2. NC 3. NO 4. Normal is 0VDC, Door Ajar 5VDC, 20mA output	LED Connection

7.5 Door Sensor and Release Button Input

Door Sensor and Release Button: C4	Pin Assignment: 1. Door Sensor 2. Ground 3. Release button 4. Ground	Sensor Connect

7.6 Panel Tamper

Panel Tamper: C5	Pin Assignment: 1. (Reserved) 2. Ground 3. (Reserved) 4. Ground 5. Tamper 6. Ground	Sensor Input

7.7 Emergency Door Open Device

Emergency Door Open: C10	Pin Assignment: 1. Power Out (12VDC, 100mA) 2. Ground 3. Signal + 4. Signal -
Install the key switch panel	

Pin Assignment for Key Switch

Pin	Type	Function	Wire Color
1		Red (V-)	Red
2	LED	Green (V-)	Green
3		VCC (12V)	Black
4	Key	N.O	Amber
5		COM (for Key and Tamper)	White
6	Tamper	N.O	Brown