

BPC-X Series User Manual

Bus Passenger Counting System is designed for transit bus fleets to obtain real-time and accurate passenger quantity information. It includes: Bus Passenger Counter, Binocular Cameras and IPAS Reporter (Intelligent Passenger Analysis System). One counter can connect 1-2 binocular cameras. 2 counters can work together for 3-4 doors long bus or other environment.

Our counter must work with our special stereo cameras, other cameras can not be supported to counting passengers. Usually all counters are well configured to each camera, so you can directly connect them by right channel number. Now you must notice below points to ensure the best

accuracy in the real bus.

System Illustration



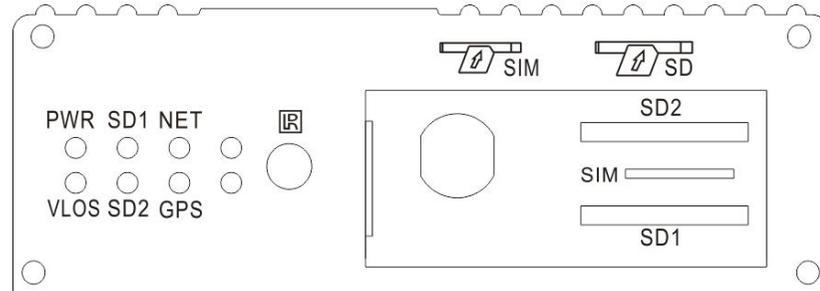
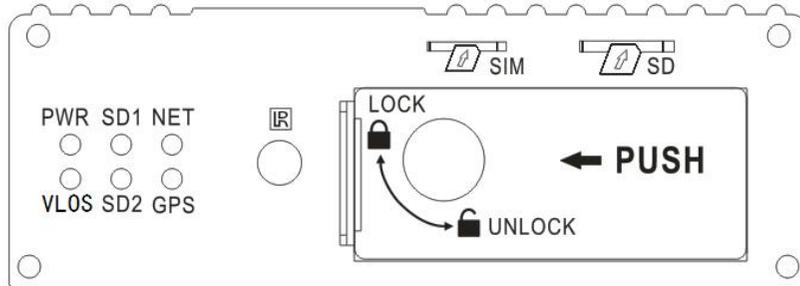
1. Counter Main Features:

- Counting Passengers with high accuracy
- Support 2PCS binocular cameras for 2doors
- SD Card Data Backup
- 3G optional
- GPS optional
- Support door sensor
- 8-36V DC input, 10A max.

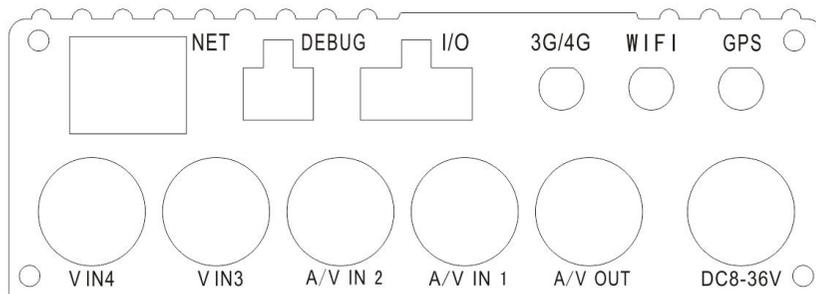
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2. Interfaces

BPC is always locked by E-lock system. When you insert or remove SD card, SIM cards, you must use the key to turn off BPC first. It will protect data and safety.



Front Panel



Rear view Panel

3. LED Indicator Alert

【PWR】 Power Input. ON is Normal

【VLOS】 Video Lose. On is Abnormal for any channel of camera. Off is normal.

【SD1】 【SD2】 SD Card . ON is exist and normal working. OFF mean not exist or bad.

【NET】 Network. On is RJ-45/3G/WIFI working normal. Off is not exist.

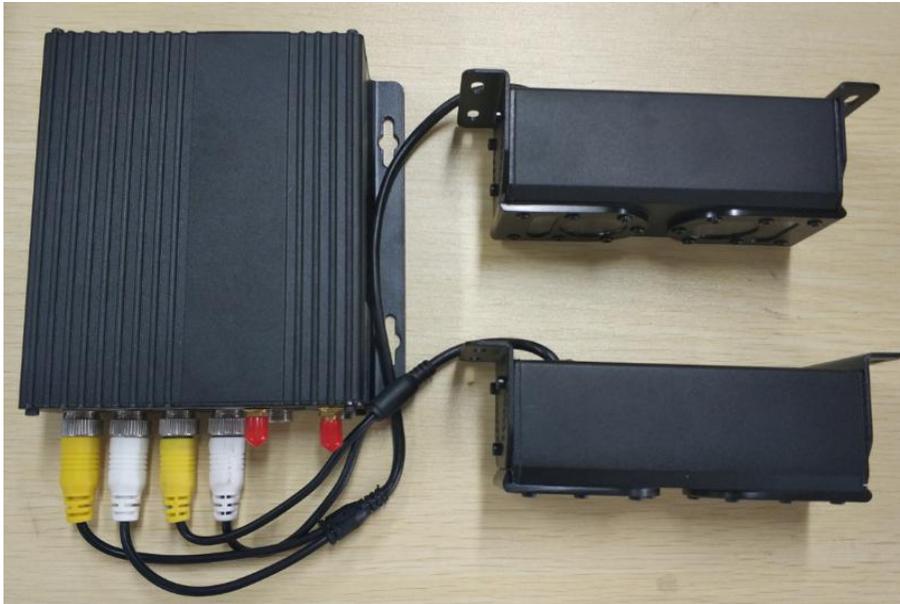
【GPS】 GPS. On is working normal.

4. Connectors

● Video Input

You can see 4 Video Input Connectors for 2pcs binocular cameras. All stereo cameras has 2pcs of aviation connectors target to 2pcs of CCD sensors. We mark its channel with CH1/CH2/CH3/CH4. Please check label on cameras, it shows you CH1, CH2.

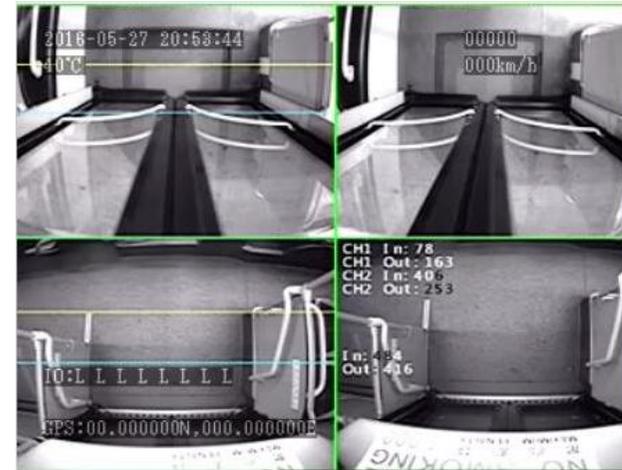
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Remarks: If cameras connection is wrong, you will not get counts or wrong counts no matter how do you setup it.

- **Video Output**

The AV Out connector is connected to LCD Monitor. Like our M-3 for bus or other big bus TV.



- **Power: 8-36V**

Our BPC has a nice car power supply to work well in serious bus environment.



- **Network**

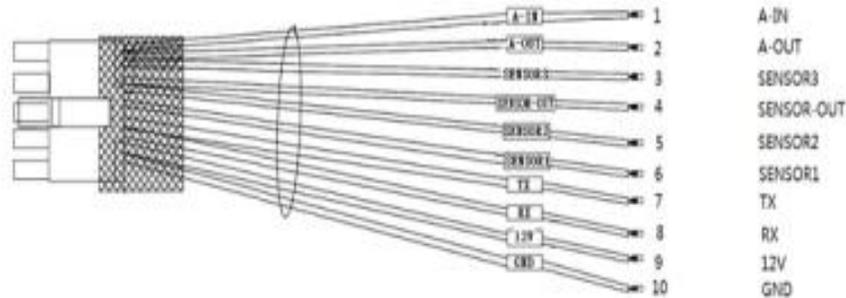
Connect to computer to setup by our BPC Client or 3G industrial router in the bus, then you can get internet and send data to your data server.

Remarks: You need to setup your LAN IP to be same 192.168.1.xxx first.

- **IO Cables**

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IO cables must connect to door sensor, so counter will improve accuracy and ensure data are sent out after door closed.



Label	Connection
A-In	Audio Input (Ignore)
A-Out	Audio Output(Ignore)
SENSOR3	Sensor Input 3 (Igonored)
SENSOR OUT	Sensor Output
SENSOR2	Connect Door Sensor 2
SENSOR1	Connect Door Sensor 2
TX	RS232-TX, Connect other devices
RX	RS232-TX Connect other devices
DC 12V	12V,1a Output

GND

GND

- **Debug**

Only for factory burning system.

- **3G/4G**

3G/4G Antennas. Only work for 3G/4G model.



- **GPS**

GPS Antennas. Only work for GPS model.



- **WIFI**

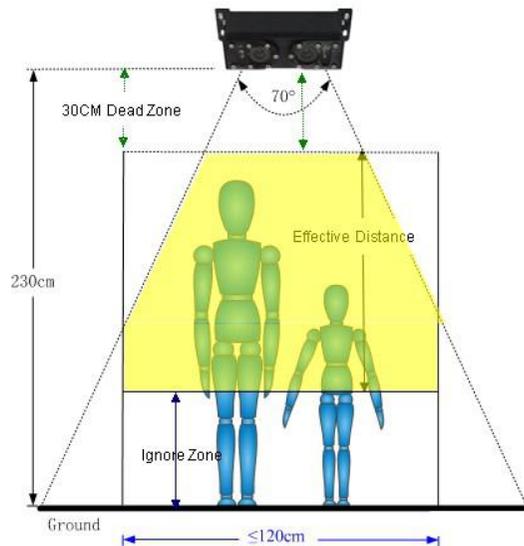
2.4GHz WIFI Antennas. Only work for WIFI model.

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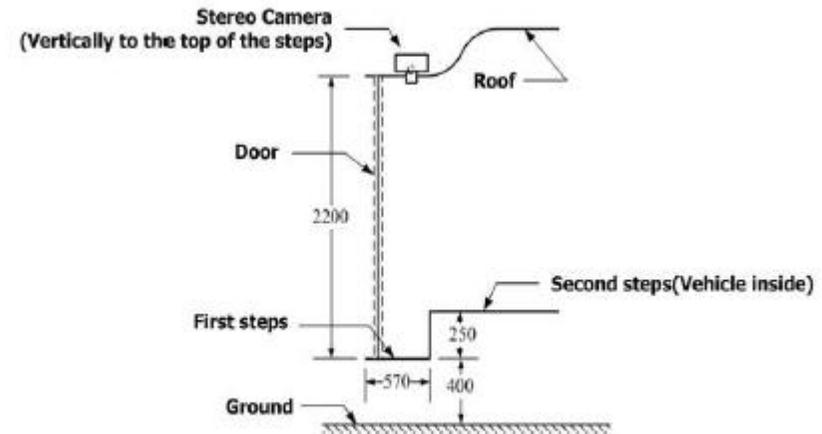


5. Camera Placement

Stereo cameras should be placed above the first stair. And its vision field should close to the door so that nobody can be missed to count.



The camera also be well fixed with screws and its cables must be hidden completely inside of the roof.



Stairs

There are 3 types of cases about steps. We must notice the counting lines position and its coverage zone. So ensure nobody fail to monitored in entrance. *On the other hand, we must put 2 counting lines within same step. It is very important.*

A: Low Floor Bus (1 Step)

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B: High Floor Bus (2-4 Steps)



C: Double-decker Bus (Lots of Steps)



6. Power Connection

Counter power cord has 3 cables. ACC(Yellow)/ Power(Red)/GND(Black), ACC

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cable must connect bus Ignition switch. So when driver start the bus, counter will start working soon. When bus engine stops, counter can keep working during configure power delay time. It will prevent counter from many accident or unexpected cases, then all counting passenger will be counted.



7. Camera Connection

All stereo cameras has 2pcs of aviation connectors target to 2pcs of CCD sensors. We mark its channel with CH1/CH2/CH3/CH4. You can also see 4CH camera input in the counter device. CAM1/CAM2/CAM3/CAM4. So CH1 cable should connect to CAM1, CH2 to CAM2---CH4 to CAM4. If your model is BPC-V1 (old model is APC-V1), you will only see 1pcs of binocular camera, and only show CH1 and CH2.

CH1(White)	CH2(Yellow)	CH3(White)	CH4(Yellow)
CAM1	CAM2	CAM4	CAM4

8. Door Sensor Connection

Counter must work with door sensors, otherwise it will keep counting but never

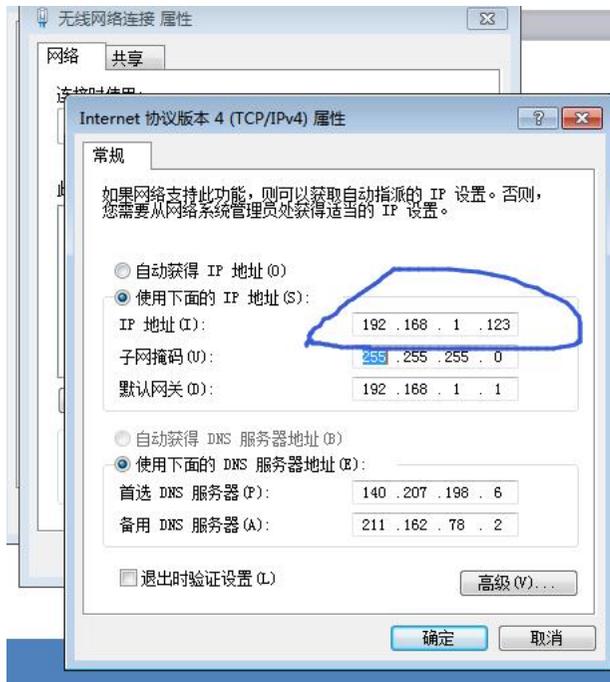
send out any data to your device or server.

1. High /Low Voltage Mode. There is a current to open the door and close the door. When the door is opened, a high, or low voltage signal will be detected. The default mode is high and low level mode. Remarks: >5V calculates high voltage and vice version.
2. Switch ON/OFF Mode. When the door is open or closed, one is without a current, and one has a current. The relationship between 0 and 1. The switch mode same setup with high and low level.
3. Pulse Mode. The pulse mode signal is unstable. First, you must choose "None" for both IO1/IO2 in BPC client. His wiring is IO3, IO4, IO5 and IO6. Then IO3 connect Door 1 Open, IO4 to Door 1 Close. IO5 to Door 2 open and IO6 to Door 2 Close. Then it will work

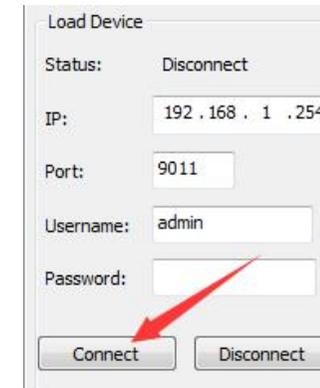


9. BPC Client Parameters Configuration

Prepare a notebook computer with Ethernet cable to connect counter device.
Ensure your LAN IP within same 192.168.1.xxx range.



Then log in BPC Client by the default IP: **192.168.1.254**, Click **Connect**.



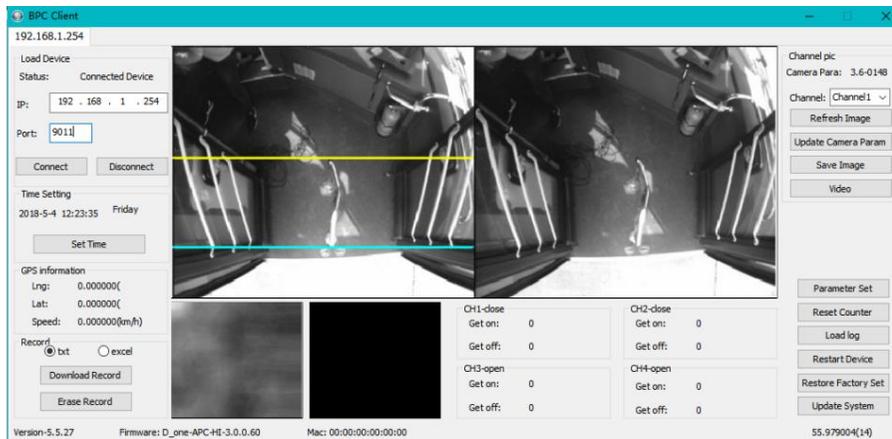
Firewall:

If necessary, you need to make port forwarding

Port	Protocol
8000	TCP
6666	UDP
5403	UDP
4567-4587	TCP

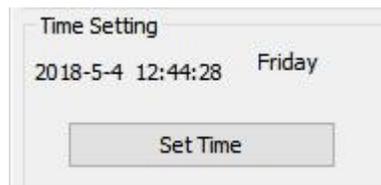
BPC Client Main Interfaces.

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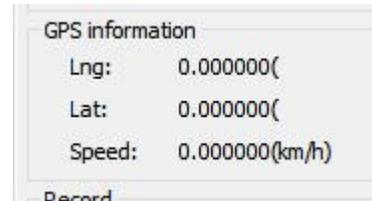
(1) Setup Time

Default time is DST-8 Beijing Time, so you need to Sync counter to your local time.



(2) Check GPS data

Whether you can get valid GPS data or not. If fail, must put antennas to windows. Or outside of windows.



(3) Check Camera ID

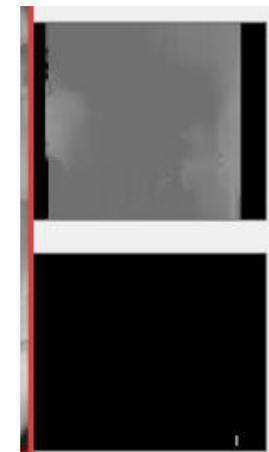
Please check the channel 1 parameter is same as CH1/CH2 stereo camera ID in the label? If not same, you must update right camera parameter files, which come from us. Usually you not need this step.

Every stereo camera has parameter ID number, for example, 3.6-1118. 3.6 means lens is 3.6mm, 1118 means serial number. it is very important to get the best precision. You can find the ID number on the body of stereo cameras. The label side should toward to the door. Then you will not setup IN/OUT direction.

If parameter ID is correct, please **keep the bus door is open**, click “Fresh Image”, then click “Save Image” to save background image. Then you can setup the system in computer.

After save image, you should see such effect in gray detection image zone and black background image zone.

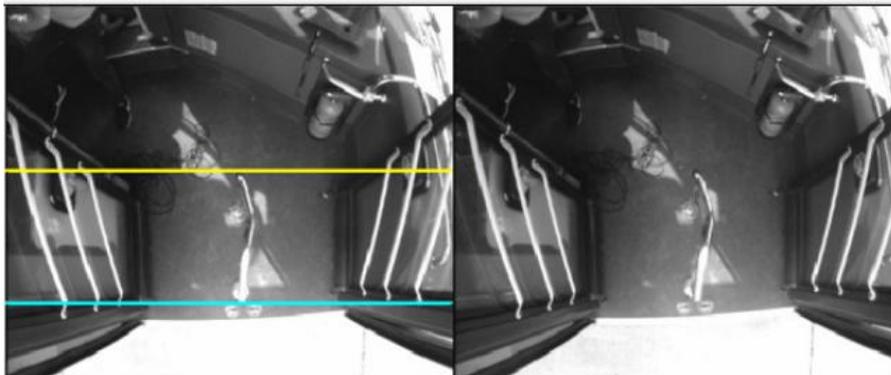
Remarks: If you see big white blocks in both 2 fields, that means your camera parameter is wrong. Or your stereo camera connection is wrong. Please check connection and camera ID label again.



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(4) Check Image

Check left and right images whether clear. If one image get dark, it may need to replace a new one.



(5) Command Buttons

Sometimes users need to control BPC to reboot or restore or update firmware.



(6) Network

According to your actual requirement, to setup the LAN IP or Server IP. You can

also use domain or DNS instead of static IP.

LAN IP:

Default 192.168.1.254. You can change to others, but you must remember it.

Subnet Mask: default is 255.255.255.0. If your LAN router is others, copy it.

Gateway IP: Copy your LAN router gateway IP. Usually keep same IP range as your computer LAN IP.

Device Name:

Usually must setup to be bus plate numbers, so your software or our IPAS statics can recognize which bus it is.

MAC:

MAC address is the unique ID to register in our IPAS system. If you fill right bus

Bus Passenger Counter Fast Guidebook

plate numbers in device name, you can see the list in IPAS unregistered list.

Server IP: The server IP will receive BPC counting results, default is our IPAS server: 174.139.192.11

Domain: If your server not have static ip, you can use domain instead of it by DNS. Domain is better than static ip for server changes and movement.

Port: The communication port to your server. IPAS is 5005.

DNS: If you use domain, you must setup DNS server too.

NTP Server

NTP server is important to correct time every hour by 3G network or GPS. It will sync time frequently.

(7) Popular Parameters

Parameter Setting

Network Setting Device Param Setting CH Param Setting

Serial Port Setting

RS232: 19200

RS485: 19200

Data comm configure

External: network

Internal: None

Device Addr: 0

Clear Counter OPT

ClearTime: None

Time Param

SYNC Time: 2 M

Power Delay: 3 M

UTC: 8 H

IO Input Set

IO1: Gate Control Low level - Open

IO2: Gate Control Low level - Open

Overman Set

Alarm Num: 0

GPRS/3G Settings

3G

APN: 3gnet

User name: card

Password: card

WIFI Settings

WIFI

WIFI Hotspot:

Password:

Function Key

Record resend

Analysis Image

Shutdown reset

Corb Size: 0

Set Device Param

Get Device Param

(8) Serial Port:

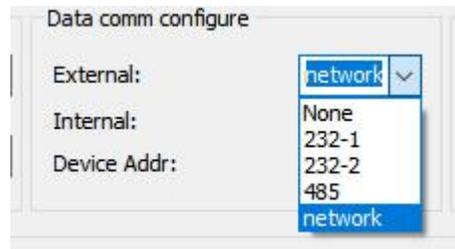
Connect to the other device like GPS tracker or Mobile DVR or Ticket POS machine, you need to choose right baud rate.

(9) Data Comm:

External: Send data to internet by which type of connection.

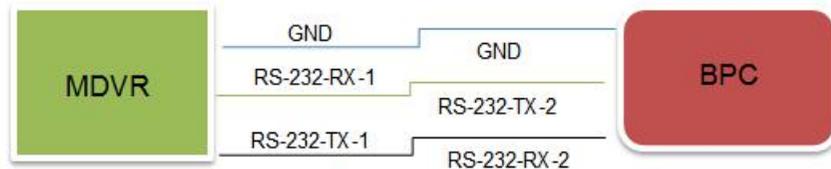
- Network: RJ-45 Connection Now. Most of choices.
- RS-232: 232-1/232-2(Other devices)
- 485: RS-485 Connection (Other devices)

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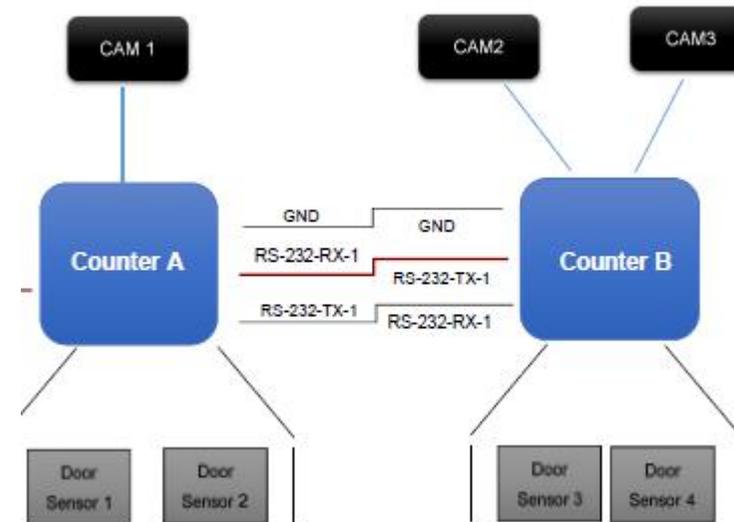
1. Integrate counter system into your own device. For example, to connect Counter to our MDVR.

RS-232-RX to RS-232-TX, RS-232-TX to RS-232-RX, GND to GND.



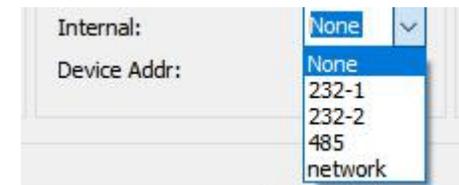
2. Build 3-4 doors counting system.

Connection is nearly same as above. However, the pair of RS-232-1 is remained to build 3-4 doors system.



Internal:

Build group of counters to communicate for wide doors, big doors, 3-4doors bus system.



Device Address:

When group of BPC working together, must use device address. 0 is the Counter A, 1 is the counter B.

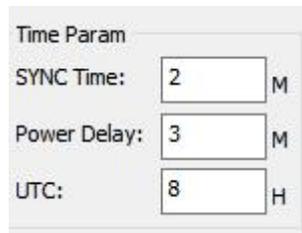
Bus Passenger Counter Fast Guidebook

(10) Setup Clear Time

When you setup this time, counter will automatically reset all current counting numbers to 0:0. It will not delete any record in the device. This will help to reduce mistake numbers.

(11) Time Configure. (Minutes)

Please setup the suitable value for each time according to your actually demands.



Time Param

SYNC Time:	<input type="text" value="2"/>	M
Power Delay:	<input type="text" value="3"/>	M
UTC:	<input type="text" value="8"/>	H

SYNC Time: for SYNC frequency. Default is 60minutes.

Power Delay: When you shut off counter by ACC/Ignition switch, counter will not shut down at once. It will keep working within 1hour, so when bus stop, people get in or out, still be counted.

UTC: default is +08:00.

(12) Setup Door Sensor.

Please keep door is open, then check the signal is high or low. If it is **high signal(>5V)**, here you should choose its type **High-OPEN**. Otherwise you will not get right counting when people get in or out.



IO Input Set

IO1:	<input type="text" value="Gate Control"/>	<input type="text" value="Low level - Open"/>
IO2:	<input type="text" value="Gate Control"/>	<input type="text" value="Low level - Open"/>

Door sensor is very important in the system design. When counter detect bus door closed, counter will stop counting. Only door is open, counter will count normally.

When door is closed, counter will upload or send out data to server. When door is open, the upload or sending will stop.

(13) Overman

Used for lift alarm. If lift over load, it will send alarm to IO output device

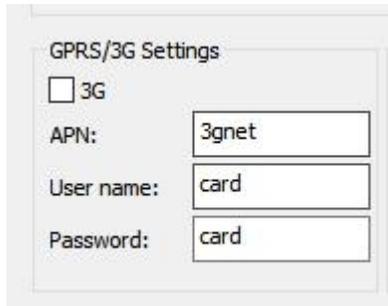


Overman Set

Alarm Num:	<input type="text" value="0"/>
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(14) 3G Setup

When BPC powerful ,you can insert SIM card into BPC. Then setup 3G APN to connect the server. **Must ensure it works in office test first.**



GPRS/3G Settings

3G

APN:

User name:

Password:

(15) WIFI Setup

If you choose BPC with WIFI, it can send offline records into your download server router when WLAN is connected. If your bus has 3G router, suggest LAN connection.



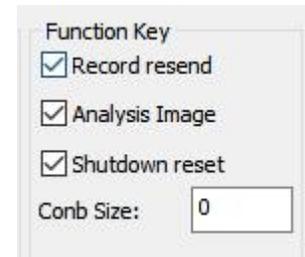
WIFI Settings

WIFI

WIFI Hotspot:

Password:

(16) Function Key



Function Key

Record resend

Analysis Image

Shutdown reset

Comb Size:

Record Resend:

When network, usually is 3G or WIFI, connection is broken, or signal is very weak, the communication may fail and some data will not send out. Then counter will send the fail records again until server receive it.

If you not use 3G or WIFI, and integrate data into your device, you can ignore it.

Analysis Image:

Enable dynamic image tracking.

Shutdown Reset:

When ACC turn off with ignition key, BPC will reset counting numbers from 0 again. It will reduce total mistake counting for every trip.

Serial Response:

When you integrate your own device, you should ensure the communication between two devices are 100% safe. So no data is lose and all records are sent to your device. When you enable this function, you must send acknowledge packet to counter when you receive such record packet. Then counter response the device--record is received and not send again.

Comb Size:

Only for wide doors.

10. Server Connection Status

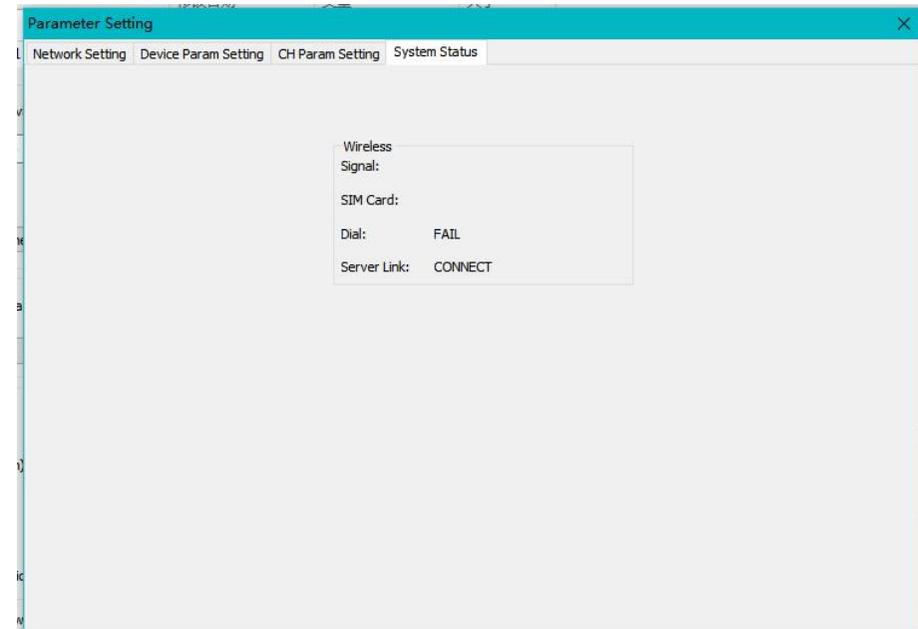
After correct all server information in bpc client, you can check system status panel to see whether it connect to server or not.

Disconnect Reasons:

- ◆ Wrong Server IP Port
- ◆ Wrong APN
- ◆ No setup DNS

Here you can also check GPS information and station ID. BPC will judge station position by GPS automatically. Of course, you must put station info into BPC first.

IPAS support download station files into BPC remotely. Or update them remotely. You must put station info in the IPAS lines correctly.



11. Accuracy Test

After installation in the bus, you must make real test ensure system running OK. Please prepare a monitor or check it in computer.

1st. Counting Lines is seen when door is open. Counting Lines are hidden when door is closed.

2nd. When door is open, make 10:10 in and out, to check whether counter result is 10:10.

3rd. Restart counter and check whether it can start counting normally again at once.

Bus Passenger Counter Fast Guidebook

12. IPAS Connection.

Usually after your setup correct server IP and port, it will send data to our IPAS server.

The screenshot shows the IPAS Analytics dashboard with a sidebar menu and a main content area. The main content area displays a table titled 'Latest Counting Records' for the date 2018-05-04. The table has columns for NO, Date&Time, Bus, Line, ON, OFF, and Load. The data shows various bus counts and loads for different lines and times.

NO	Date&Time	Bus	Line	ON	OFF	Load
1	2018-05-04 14:19:05	Rapidbus	Blue Line	36	5	0.52
2	2018-05-04 14:06:47	Rapidbus	Blue Line	0	1	-0.02
3	2018-05-04 13:53:35	Rapidbus	Blue Line	2	0	0.03
4	2018-05-04 13:56:15	Rapidbus	Blue Line	0	0	0.00
5	2018-05-04 13:50:55	Rapidbus	Blue Line	0	16	-0.27
6	2018-05-04 13:50:59	USMex13	NARANIOS	0	1	-0.01
7	2018-05-04 13:49:41	USMex13	NARANIOS	1	0	0.01
8	2018-05-04 13:47:43	Rapidbus	Blue Line	6	8	-0.03
9	2018-05-04 13:44:14	Rapidbus	Blue Line	0	5	-0.08
10	2018-05-04 13:43:17	Rapidbus	Blue Line	3	2	0.02
11	2018-05-04 13:41:47	Rapidbus	Blue Line	4	7	0.00

Unregistered Bus List. Find your device by device name, City or MAC, and add them into your lines.

The screenshot shows the IPAS Analytics dashboard with a sidebar menu and a main content area. The main content area displays a table titled 'Unregistered Bus List' with columns for NO, Device, MAC, IP Address, Location, and Control. The table lists several unregistered buses with their respective details.

NO	Device	MAC	IP Address	Location	Control
1	APC	5a-66-90-43-31-e2	121.14.14.76	Guangzhou, Guangdong, China	[Control Icon]
2	APC	b2-67-7f-37-b5-da	124.227.0.73	Shenzhen, Guangdong, China	[Control Icon]
3	APC	e6-79-7b-fb-25-10	203.223.146.134	Kuala Lumpur, Kuala Lumpur, Malaysia	[Control Icon]
4	APC	62-68-43-85-8d-f0	121.14.14.76	Guangzhou, Guangdong, China	[Control Icon]
5	BPC	72-2f-59-a1-a3-dc	183.53.66.39	Shenzhen, Guangdong, China	[Control Icon]
6	APC	f6-af-5c-9e-d3-ac	113.210.80.121	Kuala Lipis, Pahang, Malaysia	[Control Icon]

Before you move your buses into your lines. You must login your company account to create correct lines. The line should build relative stops. Then add these unregistered BPC into your lines. And complete these device information with bus plate and other information.