



Ins-30080 Net2 plus control unit

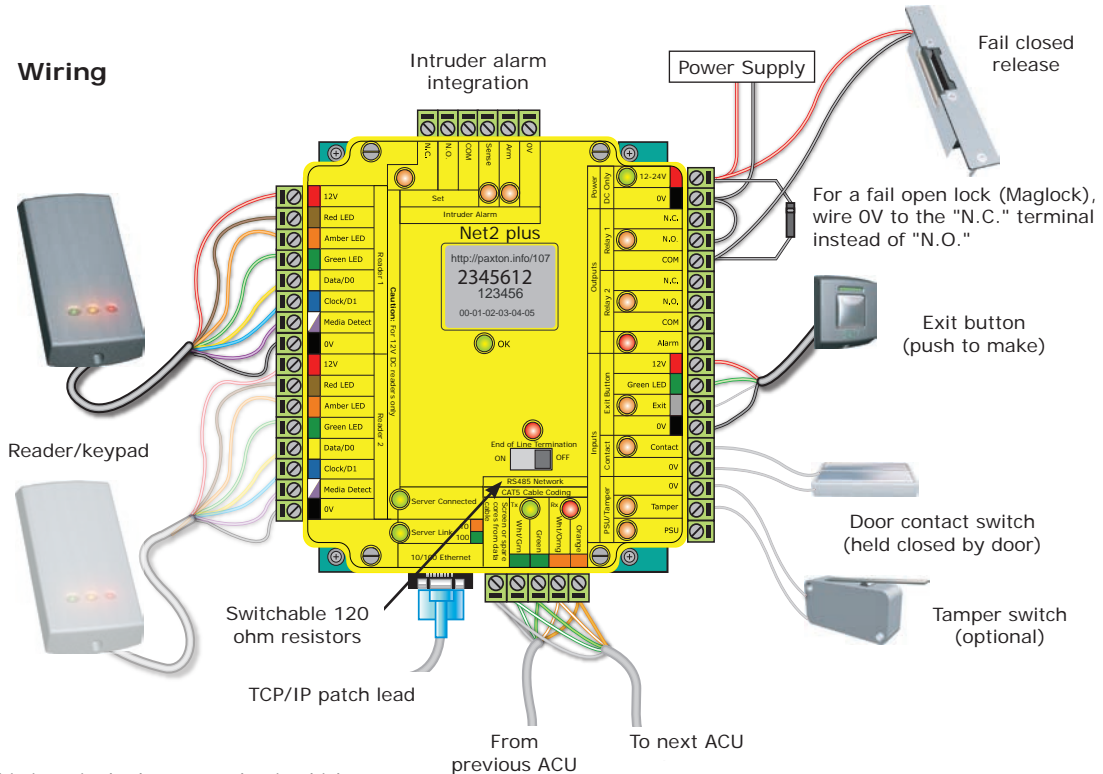


Technical help is available: Monday - Friday from 07:00 - 19:00 (GMT)  
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The Net2 plus can be connected to the PC via an RS485 data line or a TCP/IP connection.  
This unit requires the controlling PC to be running Net2 v4.14 or later software.

Wiring



This is a single door control unit which greatly simplifies installation and is ultimately highly cost effective.

## LED indications

12/24V	(Green)	- Power LED.
Relay 1	(Orange)	- The relay is energised - (N.O./COM contacts are closed).
Relay 2	(Orange)	- The relay is energised - (N.O./COM contacts are closed).
Alarm	(Red)	- 12V Alarm output is active.
Exit	(Orange)	- The exit button contacts are closed.
Contact	(Orange)	- The door contacts are closed.
Tamper	(Orange)	- The tamper contacts are closed.
PSU	(Orange)	- The PSU contacts are closed.
OK	(Green flash)	- The internal software is running.
Termination	(Red)	- The on-board resistors are in place across the RS485 data pairs.
Rx	(Red)	- The ACU is receiving data (TCP/IP or RS485) - See also FAQ section.
Tx	(Green)	- The ACU is responding to data - (TCP/IP or RS485).
Server Connected	(Green)	- The TCP/IP interface is communicating with the PC Net2 server.
Server Link		- Green = 100 Mbit/s : Orange = 10 Mbit/s (TCP/IP speed).
Intruder Alarm	(Orange)	- Signal present when lit. (see Intruder Alarm section)

## TCP/IP and RS485 LED indication

The Net2 plus performs two functions. It is an access control unit and also a TCP/IP RS485 converter. Information can pass across the PCB between the TCP/IP and RS485 data port but is not relevant to this ACU.

### - Server Connected LED (Steady Green)

This LED shows that the TCP/IP interface is active and receiving data from the Net2 PC server. This includes all data for other ACU's that may be linked via the RS485 data port.

### - Rx and Tx LED's

These LED's show the activity for this ACU only. This is same indication as seen on a Net2 classic ACU. It is not dependent on the source (TCP/IP or RS485). The Rx LED will flash for all data being received and the Tx LED will only flash when this unit responds to its own address.

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## Control unit installation

Wire the components to the unit as shown on the first page. Power up and wait for the OK heartbeat.

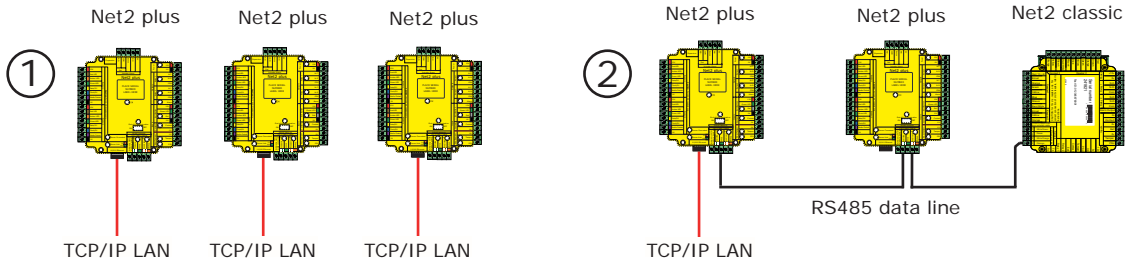
Each time the unit is powered on, it will run an internal health check. During this phase (about 5 secs) the OK LED will flash quickly before changing to a slower heartbeat.

Press the exit button or short the 0V and exit terminals together. The relay LED will come on and the lock should release.

Remember, the Net2 plus is a combined TCP/IP interface and an Access Control unit. If the TCP/IP interface is being used, you will need to detect the interface first using the procedure on the following pages.

This is important if you are replacing an existing Net2 plus. The Replace wizard in the Doors screen does NOT reconfigure the IP address so it must be done manually. The wizard will then copy across the user data.

## Site Layout Examples

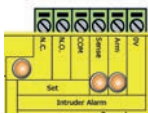


Here are two typical site layouts.

- 1 - The Net2 plus ACU's can be individually connected to the Net2 PC via the site LAN network.
- 2 - The Net2 plus ACU can be used as the TCP/IP converter for a line of Net2 plus and Net2 classic ACU's.

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## Intruder alarm integration



- Arm - Arm confirmation Push Button - Wire across 0V and Arm.
- Sense - Wire a voltage free loop across 0V and Sense to monitor the alarms current status.
- Set - Wire a voltage free loop across COM and N.O. or N.C. to provide a set signal for the alarm.

A dedicated port for input and output signals is provided when integrating a Net2 plus ACU with an alarm system. Please see: [AN1035 - Integrating Net2 with an intruder alarm system](#) < <http://paxton.info/91> >

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## Software installation

Once all the ACU's have been tested and the data line connected, the Net2 software must be installed:

- Install the Net2 software.
  - Net2 software configures the system to use a Net2 RS232/485 converter by default.
  - For TCP/IP connect: [AN1006 - Installing remote sites using TCP/IP.](#) < <http://paxton.info/105> >
  - For modem connect: [AN1007 - Installing remote sites using modems.](#) < <http://paxton.info/106> >
- Run the Net2 software and detect ACU's in the Doors screen.
- Check that all ACU's have been found. The firmware in the ACU's will be automatically updated.
- Configure the installed hardware for each ACU.
- Set up time zones, access levels, departments, other operators, etc.

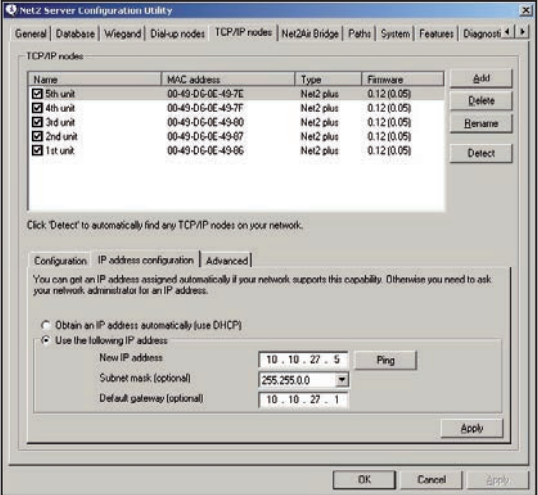
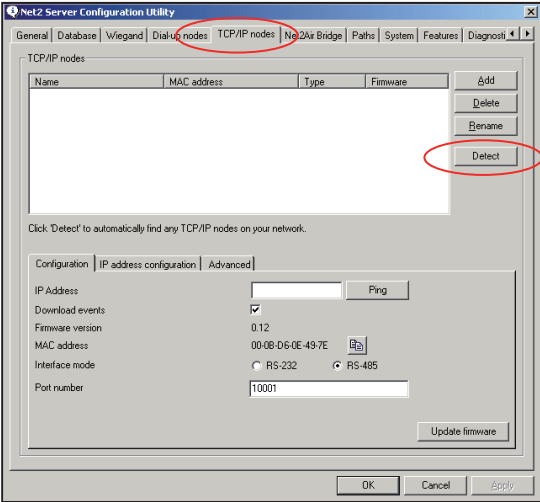
The Net2 CD can assist here with detailed application notes.

The specification for compatible PC hardware, network and operating systems is available at: <http://paxton.info/720>

## Connecting to the PC via the Ethernet port

The IP address should be assigned a fixed value, or should be given a DHCP reservation. Unreserved IP addresses issued by DHCP servers are not guaranteed to be constant, leading to potential failure of communication between Net2 software and the device.

Run the Net2 Server Configuration Utility (Start/Programs/Net2) and Click on TCP/IP nodes.



Click on **Detect** and the MAC address of the device(s) will appear in the table. You must then use the "IP address configuration" tab to manually assign the IP address, subnet mask and gateway.

Some firewall/virus protection software and other wireless hardware can block the IP detection process. Disable these and try to detect the device again. Please contact Technical Support if you require further advice.

If the MAC address does not appear when you click **Detect**, ensure that the following ports are open on all devices between this unit and the Net2 PC:-

69	UDP	10001	TCP	30718	UDP
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**TCP/IP Reset** - The unit can be returned to DHCP settings by powering down the unit and linking the Brown and Mauve terminals on reader port 2. Power up the unit again and the unit will beep to acknowledge the link. You may now remove the link and the OK LED will flash fast for a few seconds. When the OK LED returns to a steady heartbeat, the IP settings will be reset to DHCP.

## Connecting to a WAN or different subnet mask

If you are connecting this device to a different subnet, the standard detect mechanism will not work across the network. The IP address, along with the correct subnet mask and gateway for the remote subnet have to be set.

Once installed, create a record with the **Add** button (if none was created during initial set up) and you should then be able to detect its MAC by entering the IP address in the Configuration screen Ping box. - Click Ping.

## TCP/IP Loopback test

The following test should be run if there are problems detecting the interface. This test sends data to the device and checks this against the data it receives back. The Net2 server program must be shut down during this test.

Remove any wires from the RS485 data line connector and create a hardwired data loop as follows. Connect the Orange to White/Green and Green to White/Orange. To run the test, go to Net2 Server Config Utility/TCP/IP Nodes/Advanced and click on Loopback test. If the test fails, connect the unit directly to the PC with an RJ45 patch cable and test it again. Should this still fail, please call Technical Support for further advice.

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## Connecting to the PC or other ACU's via the RS485 data connection

**90% of installation faults are caused by wiring errors on the RS485 data line. Special attention to getting this right first time saves a lot of time and effort.**

The data line must be wired in a single daisy chain. The data converter may be located anywhere along the data line. 120 ohm terminating resistors must be linked across each data pair at the beginning AND end of the line. This can be done on many units with a switch or jumpers. If not, free resistors are provided with the converter.

An RS485 data line has a 1 km maximum length. This distance can be increased by using Paxton high speed repeaters or by using shorter independent data lines on multiple LAN connections controlled from the same PC.

### END OF LINE TERMINATION SWITCHES.

- These should all be OFF except for those at both ends of the data line.

### READER & DATA CABLE SCREENS.

- Data cable screens and spare cores MUST be connected throughout.

- Reader and keypad screens where provided should be connected to the Black (0V) terminal.

### RS485 data line resistance checks

Power down all TCP/IP, USB and RS232 converters (individual and Net2 plus).



Check the resistance across each data pair is 60-80 ohms.



Check that there are no data line to screen shorts.



Check the screen of the data cable is continuous - this provides the 0V DC system reference.

Here is the list of topics about this product that receive the most technical support enquiries. We list them here to help you speed up the installation and trouble shooting process.

## **1 - RS485 Data line resistance check - ACU not responding or fails to be detected.**

First power down any data line converters and disconnect any ACU's that do not have a flashing OK LED. Using a Multimeter, measure the resistance across the White/Green and Green pair at one end of the network. A resistance of between 60 and 80 ohms is required. Repeat the test for the White/Orange and Orange pair. This is vital for a stable and trouble free installation.

## **2 - ACU Reset - No OK LED flashing.**

The ACU has no factory reset condition as it does not contain any fixed settings. The unit does have an operating program (firmware) that controls its functions and can be confirmed as running by means of the flashing OK LED.

- If the OK LED is flashing steadily, then there should be no reason to reset the unit.
- If the OK LED is not flashing, you need to clear the unit so that it can receive a firmware download from the PC. Any other ACU's without OK LED's must be taken off the line or powered down.

1. Stop Net2 Server (Net2 server icon - Bottom right of screen - Right mouse click, Select Stop the Net2 Server).
2. Power down the Net2 ACU.
3. Insert a link wire between the Orange and Mauve terminals on reader 2 port.
4. Power up the ACU. - The OK LED flashes very quickly.
5. With the unit still powered, remove the link.
6. Go to the PC and Start the Net2 Server and go into the Doors screen. Click on the Detect button. This should look for the ACU and then download its firmware (This may take up to 5 minutes). - The OK LED should now be flashing with a steady heartbeat. This procedure must only be done for one ACU at a time.

NOTE: If this unit is using the TCP/IP interface, any fixed IP settings will be retained. If the unit is in DHCP mode it will need to be detected at each stage using the Net2 Server Config Utility as a new address may be issued by the IP server, each time the PCB resets.

## **3 - Can we use a DHCP IP address?**

The Ethernet interface does support DHCP, but for more reliable communication, a static IP address must be reserved for the unit. This is because some servers issue different DHCP addresses each time they are restarted and this requires the Net2 interface to be manually set up again - a time consuming process.

## **4 - TCP/IP - Direct PC connection.**

Connect the network interface directly to the LAN port of the PC. Without the presence of a DHCP server the unit will default to an IP address in the range 169.254.X.X.

Check the IP address of the network card of your PC by typing IPCONFIG at the command prompt. Detect the TCP/IP interface with the Net2 Server Configuration Utility and change the IP address to an address similar to that of your machine. For example, if the IP address of the PC is 192.168.10.7, change the IP address of the TCP/IP interface to 192.168.10.8. Once the IP address of the interface has been changed into the range of the PC then Net2 will be able to communicate with it.

NOTE: Do not change the IP address of your PC to 169.254.x.x, this will not allow the IP address of the TCP/IP interface to be fixed correctly.

# Specifications

Electrical	Min	Max	
Voltage	11V DC	24V DC (+20%)	Wiring label
PCB Current (depending on activity)		200 mA	
Relay switchable voltage		24V DC (+20%)	
Relay switchable current		4 A	
Alarm output current		1 A	@ 12V DC
Combined reader port output current		500 mA	
Environment	Min	Max	
Operating temperature - Battery limits	0 °C	+ 55 °C	
Waterproof			No
Communication	Min	Max	
Ethernet network speed	10 Mbit/s	100Mbit/s	
Ethernet bandwidth requirement		200 kbit/s	
DHCP support (fixed IP recommended)			Yes
RS485 network speed		115.2 kbit/s	
Features	Min	Max	
Number of Cards		50,000	Net2 v4.16
Number of PIN's		50,000	Net2 v4.16
Access levels		250	
Time zones		64	
Door open time	1 sec	999,999 sec	
Number of Codes		50	
Doors per ACU		1	
Reader ports per ACU		2	
Readers per port		2	
Keypads per port		2	
ACU per data line	1	200	
Data lines per PC	1	200	Net2 v4.21
Data retention after total power loss	7 days		
Events stored in ACU with no server connection		2,728	
Dimensions	Width	Height	Depth
Control Unit	116 mm	126 mm	25 mm
Plastic Housing	200 mm	200 mm	75 mm

## Contents in box

Net2 plus control unit			
Plastic Housing - Option			
Documentation			
		Qty	Description
Fitting Kits	fk1-096	1	Net2 plus
	fk1-039	4	120 ohm resistors



The declaration of conformity is available on request. Contact details are provided at: <http://paxton.info/596>