coolgear

1 Port Ethernet to CAN Bus Adapter

w/ 16kV ESD Surge Protection

Model Number: *NCAN-1*

Product Manual

Coolgear, Inc.

Version: 1

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Contents

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1. INTRODUCTION

References to NCAN in this document represent all NCAN CAN to Ethernet Gateway, unless stated otherwise.

NCAN is a network-based CAN to Ethernet Gateway. It is designed to control your serial devices located virtually anywhere through a TCP/IP or UDP/IP network connection. The serial device server can map TCP/IP connections and UDP broadcasts to a virtual serial port. Applications include accessing a faraway device for functions such as remote control and data transmission. NCAN serves as a transparent virtual serial port without limitations on operating systems and distances. The virtual serial port redirection uses the protocol known as RFC2217.

NCAN supports several operation modes, including Driver mode, RFC2217 Server/Client mode, Pair Connection mode, TCP Server/Client mode and UDP mode. It also supports Windows virtual serial port driver, allowing you to add two virtual serial ports in your Windows system to work over a TCP/IP network. The virtual serial port functions as a native Windows COM port and is compatible with Windows serial communication applications. It is installed in the Device Manager of the operating system.

Serial port operation mode can be easily changed in NCAN via software. This can be done using our Windows utility software or the web console interface.

NCAN CAN to Ethernet Gateway supports automatic IP configuration protocol (DHCP) and fixed static IP configuration via the handy web browser console. NCAN provides a utility software for Windows, called NCOM Virtual Serial Port Manager. This program can detect, manage and configure CAN to Ethernet Gateway in your network.

This manual covers three different models of two-port serial device server:

NCAN-1	One channel CAN to Ethernet Gateway
NCAN-1 PoE	One channel CAN to Ethernet Gateway with Power over Ethernet
NCAN-1-ISO	One channel ISO CAN to Ethernet Gateway
NCAN-1-ISO PoE	One channel ISO CAN to Ethernet Gateway with Power over Ethernet

1.1 Key Features

The NCAN-1 CAN to Ethernet Gateway has the following features:

- Adds one virtual CAN ports via network connection
- Supports network protocols such as TCP and UDP client/server
- CAN bus speed up to 1Mbits
- Provides DC +5V 100mA power for external devices
- Supports CAN 2.0A and CAN 2.0B protocols
- Supported CAN modes
  - Standard mode: normal operation on CAN bus
  - Listen mode: passive receiving of CAN frames
  - Echo mode: transmitter also receives sent frames (for testing purposes)
- Operation mode can be easily changed via our Windows utility software or the web console interface
- Firmware upgradable for future firmware revisions
- Supports virtual CAN port driver for Windows OS (Windows XP up to Windows 11)
- NCAN supports Driver Mode ,RFC2217 Server Mode, RFC2217 Client Mode, Pair Connection Mode, TCP Raw Server Mode, TCP Raw Client Mode and UDP Mode
- Supports pair connection mode for connecting two CAN to Ethernet Gateway over a network without a PC
- Supports multiclient with four clients
- UDP Mode support Buffer Length and Timeout setting
- Easy-to-use Windows utility software for easy configuration and installation
- 10/100Mbps Ethernet with auto-detection
- Configuration via web console interface or utility software
- Windows utility software automatically finds NCAN CAN to Ethernet Gateway on the network
- Supports “reset” button for system reset and restoring to default settings
- LEDs indicating Ethernet port’s link and speed statuses
- LEDs indicate initialization and CAN bus status
- Virtual serial port drivers for Windows 11, 10, 8.1, 8, 7, Vista, 2003, XP
- Built-in +/-16kV ESD protection for all serial signals

1.2 Specifications

LAN	
Ethernet	10/100Mbps
Connector	RJ-45 connector
Protection	Built-in 1.5kV magnetic isolation

NCAN-1 CAN Interface	
No. of Ports	One
Connector	DB9 male connectors
CAN Bus Speed	5kbits to 1Mbits for CAN data transmit & receive
Signals	CAN_H, CAN_L, CAN_GND, CAN_V+
CAN Bus Controller	Bosch C_CAN module
LED	CAN bus data activity, CAN bus error
CAN Bus Mode	Standard mode: normal operation on CAN bus Listen mode: passive receiving of CAN frames Echo mode: transmitter also receives sent frames (for testing purposes)
Protection	+/-16 KV ESD protection for CAN signals

NCAN-1 PoE CAN Interface	
No. of Ports	One
Connector	DB9 male connectors
CAN Bus Speed	5kbits to 1Mbits for CAN data transmit & receive
Signals	CAN_H, CAN_L, CAN_GND, CAN_V+
CAN Bus Controller	Bosch C_CAN module
LED	CAN bus data activity, CAN bus error
CAN Bus Mode	Standard mode: normal operation on CAN bus Listen mode: passive receiving of CAN frames Echo mode: transmitter also receives sent frames (for testing purposes)
Protection	+/-16 KV ESD protection for CAN signals
Option	Power over Ethernet

NCAN-1-ISO CAN Interface	
No. of Ports	One
Connector	DB9 male connectors
CAN Bus Speed	5kbits to 1Mbits for CAN data transmit & receive
Signals	CAN_H, CAN_L, CAN_GND, CAN_V+
CAN Bus Controller	Bosch C_CAN module
LED	CAN bus data activity, CAN bus error
CAN Bus Mode	Standard mode: normal operation on CAN bus Listen mode: passive receiving of CAN frames Echo mode: transmitter also receives sent frames (for testing purposes)
Protection	+/-16 KV ESD protection for CAN signals 2500V galvanic isolation on CAN bus

NCAN-1-ISO PoE CAN Interface	
No. of Ports	One
Connector	DB9 male connectors
CAN Bus Speed	5kbits to 1Mbits for CAN data transmit & receive
Signals	CAN_H, CAN_L, CAN_GND, CAN_V+
CAN Bus Controller	Bosch C_CAN module
LED	CAN bus data activity, CAN bus error
CAN Bus Mode	Standard mode: normal operation on CAN bus Listen mode: passive receiving of CAN frames Echo mode: transmitter also receives sent frames (for testing purposes)
Protection	+/-16 KV ESD protection for CAN signals 2500V galvanic isolation on CAN bus
Option	Power over Ethernet

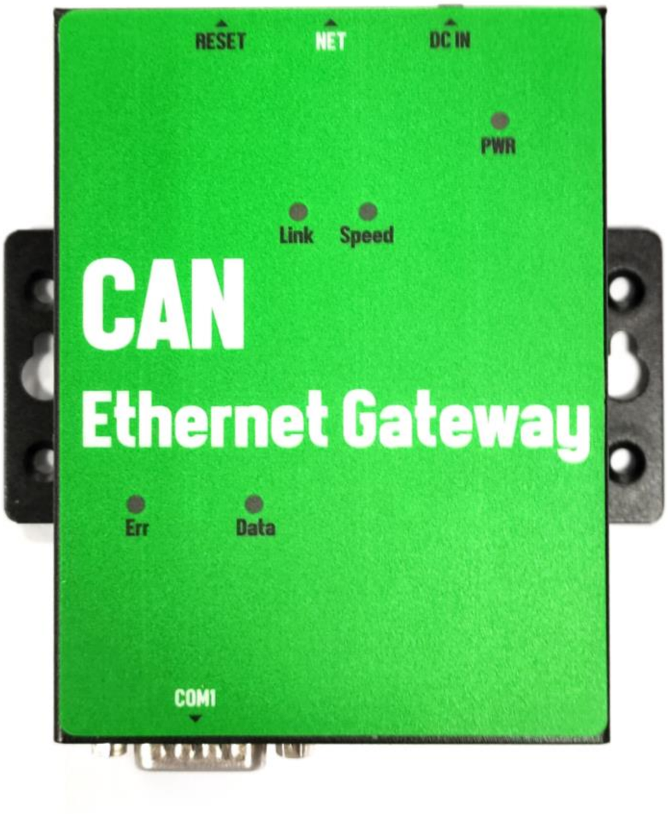
Software Features	
API Library	Supports C/C++, C#, VB.NET and LabVIEW
Utility	Management tool for Windows OS
OS Driver Support	Windows XP to Windows 11 OS Windows Server 2003 to 2022
Monitoring Tools	Supported by CANHacker, Titan CAN test program BUSMASTER

Power Requirement	
Power Input	9VDC to 48VDC
Power Consumption	400mA@12VDC

Environment	
Operating Temperature	0°C to 55°C (32°F to 131°F)
Storage Temperature	-20°C to 75°C (-4°F to 167°F)
Humidity	5% to 95% RH
Safety Approvals	CE, FCC

Mechanical	
Casing	SECC sheet metal (1mm)
Dimensions	95 × 71 × 22 mm (L × W × H) 100 × 91 × 22 mm with DB-9 connector and ears (L × W × H)
Weight	220g

2. PANEL LAYOUT OF NCAN-1



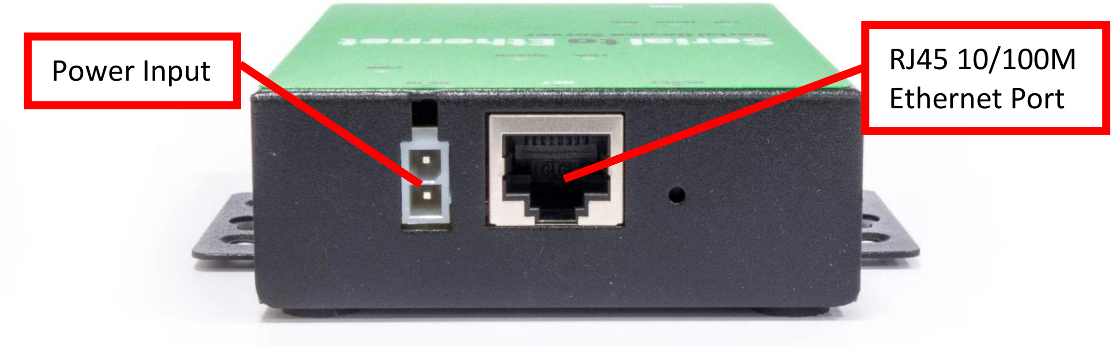
Note: The layouts of NCAN-1 PoE, NCAN-1-ISO and NCAN-1-ISO PoE is the same as the ones for NCAN-1.

3. CONNECTING THE HARDWARE

Before connecting the NCAN CAN to Ethernet Gateway for the first time, you may want to follow these instructions for testing purposes. We will describe how to connect to the network, power, your CAN devices, and state the functions of the LED indicators.

3.1 Step 1 – Connecting to the Network

First, connect an Ethernet cable to NCAN's Ethernet port. Once the Ethernet cable is connected, connect the other end of the cable to your network. This can be a free Ethernet port on your DSL router, Ethernet hub/switch, or 802.11n router/base station. If you do not have a network, you can connect NCAN directly to the Ethernet port on your computer.

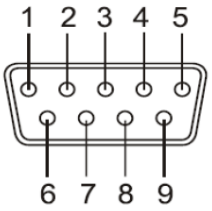


3.2 Step 2 – Connecting the Power

Connect the included power supply to NCAN's power input connector. Once the NCAN is powered, the "PWR" LED turns ON. After a few seconds, the "PWR" LED will flash two times to indicate that the NCAN CAN to Ethernet Gateway is ready.

3.3 Step 3 – Connecting to a CAN Device

Connect the CAN data cable between NCAN and the CAN device. The NCAN-1's CAN port provides CAN BUS 2.0A and CAN BUS 2.0B. The port uses a standard male DB9 pin assignment.



DB9 Male connector pin numbers

3.4 CAN Bus Pin-out for DB9 connector

Pin Number	Signals	Description
1	CAN_V+	Provides +DC 5V 100mA power (optional)
2	CAN_L	CAN_L bus line (dominant level is low)
3	CAN_GND	Signal ground
4	-	Reserved
5	-	Reserved
6	CAN_GND	Signal ground
7	CAN_H	CAN_H bus line (dominant level is high)
8	-	Reserved
9	CAN_V+	Provides +DC 5V 100mA power (optional)

3.5 Enabling the +5V 100mA power for external devices

Inside the unit, there is a 2-pin header block (JP2) which are jumpers for enabling 5V 100mA power for external devices.

JP3 Jumper	Function
ON	Enable DB9 pins 1 and 9 to provide a 5V 100mA power for external devices
OFF	Disable the 5V 100mA power

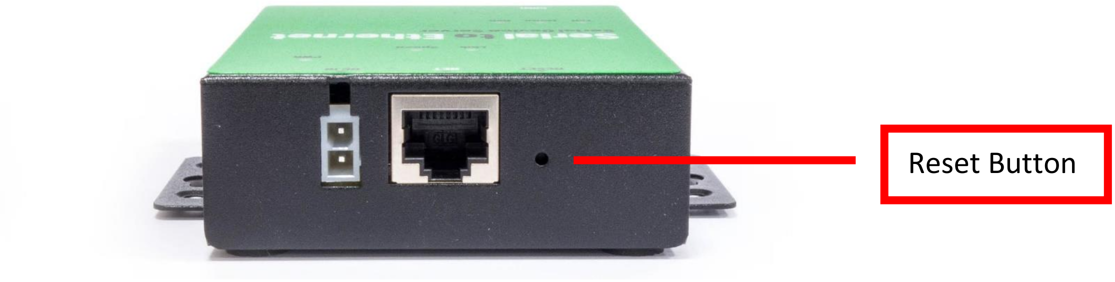
3.6 Termination Resistors

The CAN adapter does not provide CAN bus termination resistors. A CAN bus network requires 120Ω termination resistors at each end. Generally, this must be done in the cabling. Since this depends on the installation of connections, please check your CAN bus cable specification for proper impedance matching.

3.7 Hardware Reset Button

NCAN-1 has a hardware reset button for resetting the device. When the hardware reset button is pressed for a short duration, NCAN's power will be reset.

The hardware reset button can be used to restore all options to factory default states by pressing it until the "PWR" LED flashes.

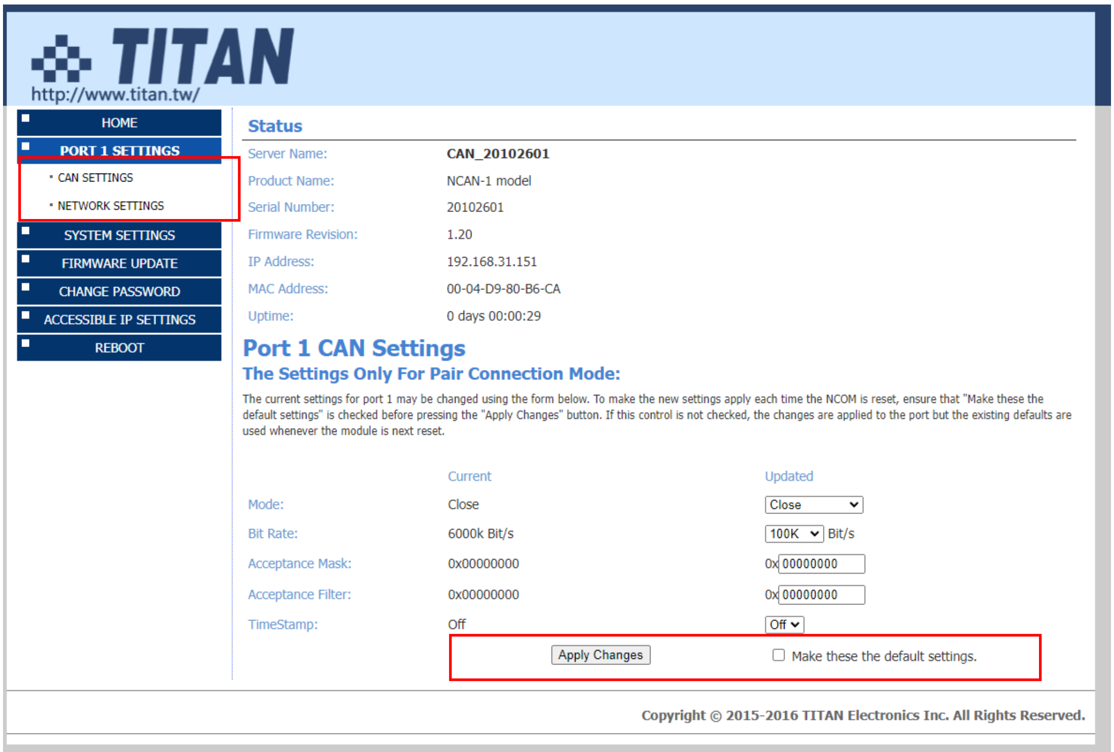


3.8 Changing CAN Port Operation Mode in NCAN-1

CAN port operation mode of NCAN-1 can be easily changed via software. This can be done using our Windows utility software or the web console interface.

The web console interface is used to configure the CAN to Ethernet Gateway. Open any web browser and enter the device’s IP address in the address bar to access the firmware’s “HOME” page.

Under the firmware’s “HOME” page, select “CAN SETTINGS” under “Port 1 Settings” and “Port 2 Settings”. Under “Mode”, select the proper serial port operation mode, check the “Make these the default settings” box and click “Submit” to set your device into the proper serial port operation mode.



Status

Server Name:	CAN_20102601
Product Name:	NCAN-1 model
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00-04-D9-80-B6-CA
Uptime:	0 days 00:00:29

Port 1 CAN Settings

The Settings Only For Pair Connection Mode:

The current settings for port 1 may be changed using the form below. To make the new settings apply each time the NCOM is reset, ensure that "Make these the default settings" is checked before pressing the "Apply Changes" button. If this control is not checked, the changes are applied to the port but the existing defaults are used whenever the module is next reset.

	Current	Updated
Mode:	Close	Close
Bit Rate:	6000k Bit/s	100K Bit/s
Acceptance Mask:	0x00000000	0x 00000000
Acceptance Filter:	0x00000000	0x 00000000
TimeStamp:	Off	Off

□ Make these the default settings.

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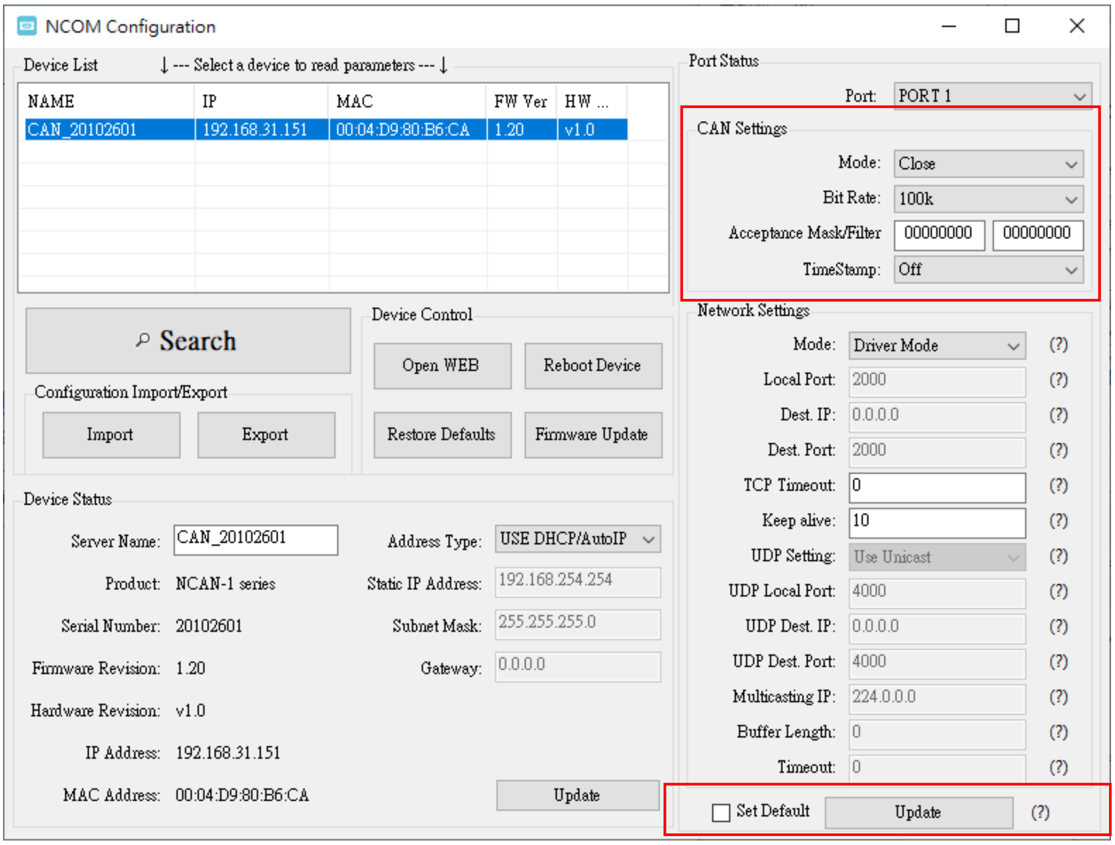
The port operation mode can also be configured with our Windows utility software, NCOM Virtual Serial Port Manager.

After running NCOM Virtual Serial Port Manager, click on “Configuration” to enter the control menu page. Select an attached device to configure the virtual serial port parameters. You will find “Device Status”, “Port Status”, “Device Control” and “Configuration Import/Export” on the main window of NCOM Configuration.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode (?)

Local Port: 2000 (?)

Dest. IP: 0.0.0.0 (?)

Dest. Port: 2000 (?)

TCP Timeout: 0 (?)

Keep alive: 10 (?)

UDP Setting: Use Unicast (?)

UDP Local Port: 4000 (?)

UDP Dest. IP: 0.0.0.0 (?)

UDP Dest. Port: 4000 (?)

Multicasting IP: 224.0.0.0 (?)

Buffer Length: 0 (?)

Timeout: 0 (?)

□ Set Default

Under the “Port Status” window, select “Port 1”. Under “Mode”, select the proper port operation mode, then check “Set Default” and click “Update” to set your NCAN-1 in the proper serial port operation mode.

3.9 LED Indicators

The NCAN-1 has 5 LED indicators, as described in the following table:

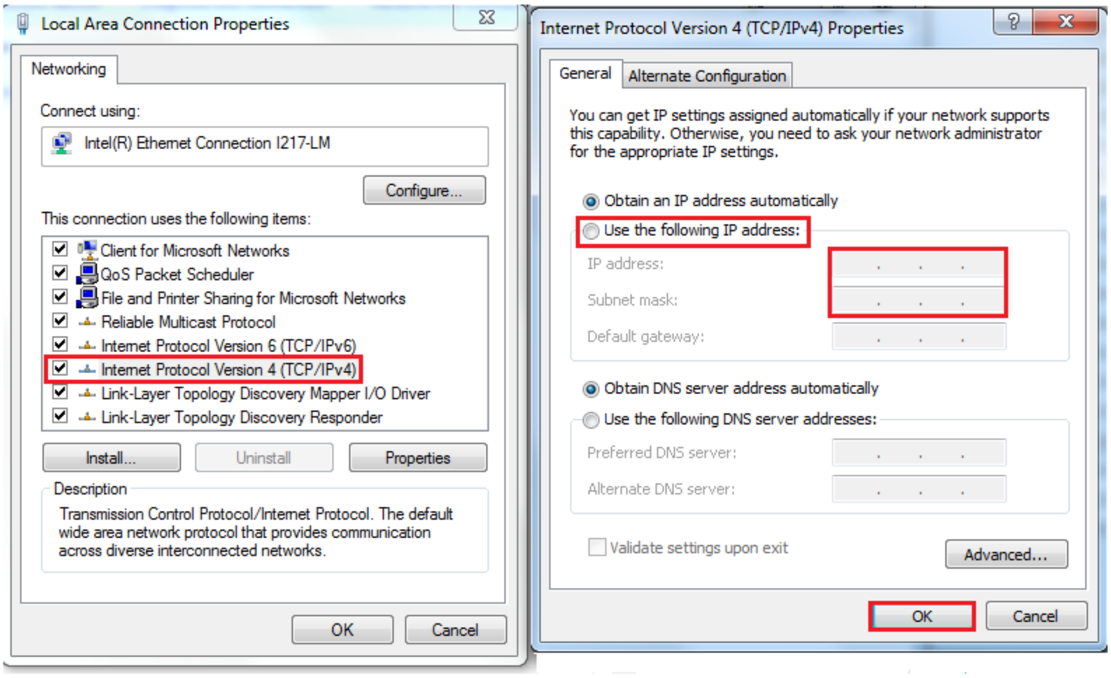
LED Name	LED Color	LED Function
PWR	Red	Steady on: Power is on and functioning normally. Steady off: Power is off. Flashes two times to indicate the device is ready.
Link	Yellow	Steady on: The Ethernet link has established. Steady off: Ethernet cable is disconnected. Blinking: Ethernet data transmission is occurring.
Speed	Green	Steady on: The device is connected to a 100M Ethernet connection. Steady off: The device is connected to a 10M Ethernet connection.
data	Green	Blinking: The CAN bus is transmitting or receiving data.
Err	Red	Blinking: The CAN bus have error status.

4. CONFIGURING NCAN-1 FOR THE FIRST TIME

4.1 Configuring Static IP Address

When setting up your NCAN-1 for the first time, it is important to configure the IP address in order to operate in your network. The NCAN-1 products are configured with the following default private IP address:
Default private IP address: 192.168.254.254

You need to set up your client computer to static IP address manually. Please go to “Internet Protocol Version 4 (TCP/IPv4)” under “Local Area Connection Properties” to change the IP address to a static IP address. (This can be found from Start → Settings → Control Panel → Network and Internet → Network and Sharing Center → Change Adapter Settings → Local Area Connection → Properties).



Local Area Connection Properties

Networking

Connect using:

Intel(R) Ethernet Connection I217-LM

Configure...

This connection uses the following items:

☑ Client for Microsoft Networks
☑ QoS Packet Scheduler
☑ File and Printer Sharing for Microsoft Networks
☑ Reliable Multicast Protocol
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder

Install... | Uninstall | Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK | Cancel

Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically
○ Use the following IP address:
IP address: . . .
Subnet mask: . . .
Default gateway: . . .

● Obtain DNS server address automatically
○ Use the following DNS server addresses:
Preferred DNS server: . . .
Alternate DNS server: . . .

□ Validate settings upon exit

Advanced...

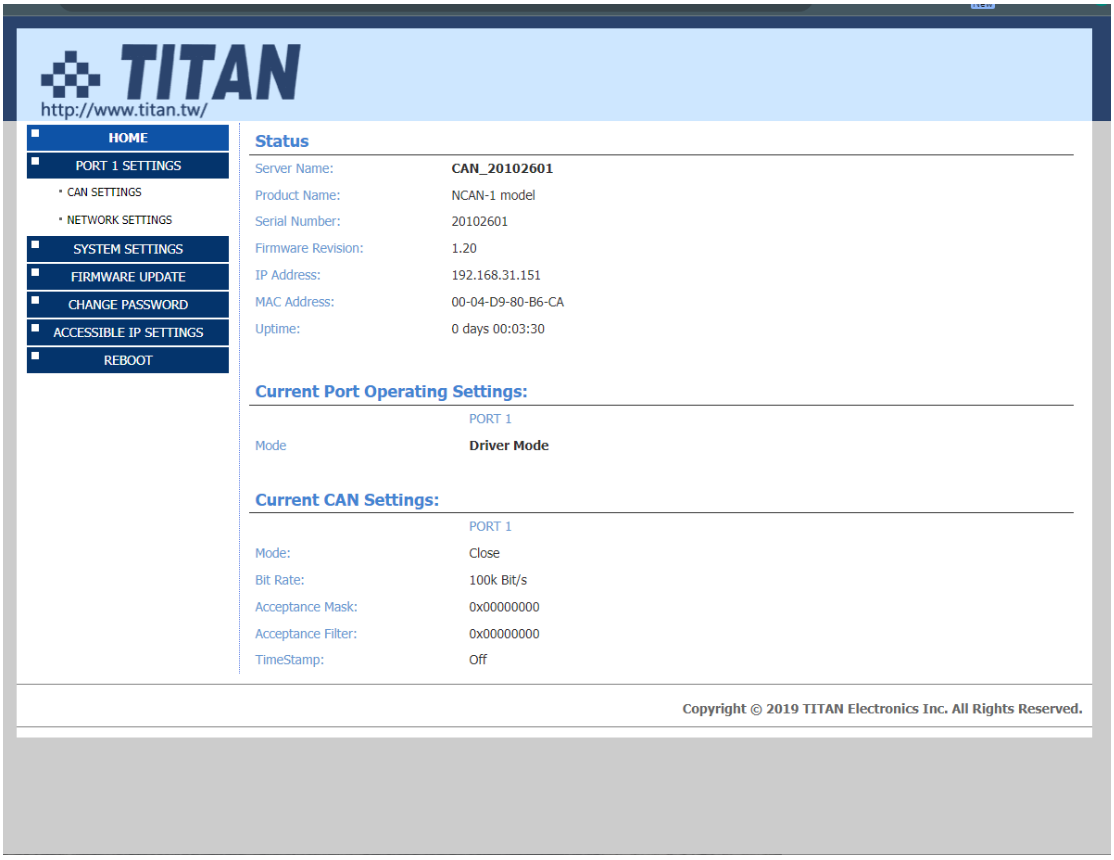
OK | Cancel

Under “Internet Protocol Version 4 (TCP/IPv4)”, select “Use the following IP address:” and enter the static IP address 192.168.254.XXX (such as 192.168.254.253) and Subnet mask (such as 255.255.255.0) then click “OK” to set your client computer to static IP address.

After setting your client computer to a static IP address and connecting to NCAN-1, you can configure NCAN-1 via its web console interface.

4.2 Opening the Web Console Interface of NCAN-1

NCAN-1 offers a web console interface to configure the CAN to Ethernet Gateway. Open any web browser and enter ip address in the address bar to access the “HOME” page of NCAN-1.



Status

Server Name:	CAN_20102601
Product Name:	NCAN-1 model
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00-04-D9-80-B6-CA
Uptime:	0 days 00:03:30

Current Port Operating Settings:

	PORT 1
Mode	Driver Mode

Current CAN Settings:

	PORT 1
Mode:	Close
Bit Rate:	100k Bit/s
Acceptance Mask:	0x00000000
Acceptance Filter:	0x00000000
TimeStamp:	Off

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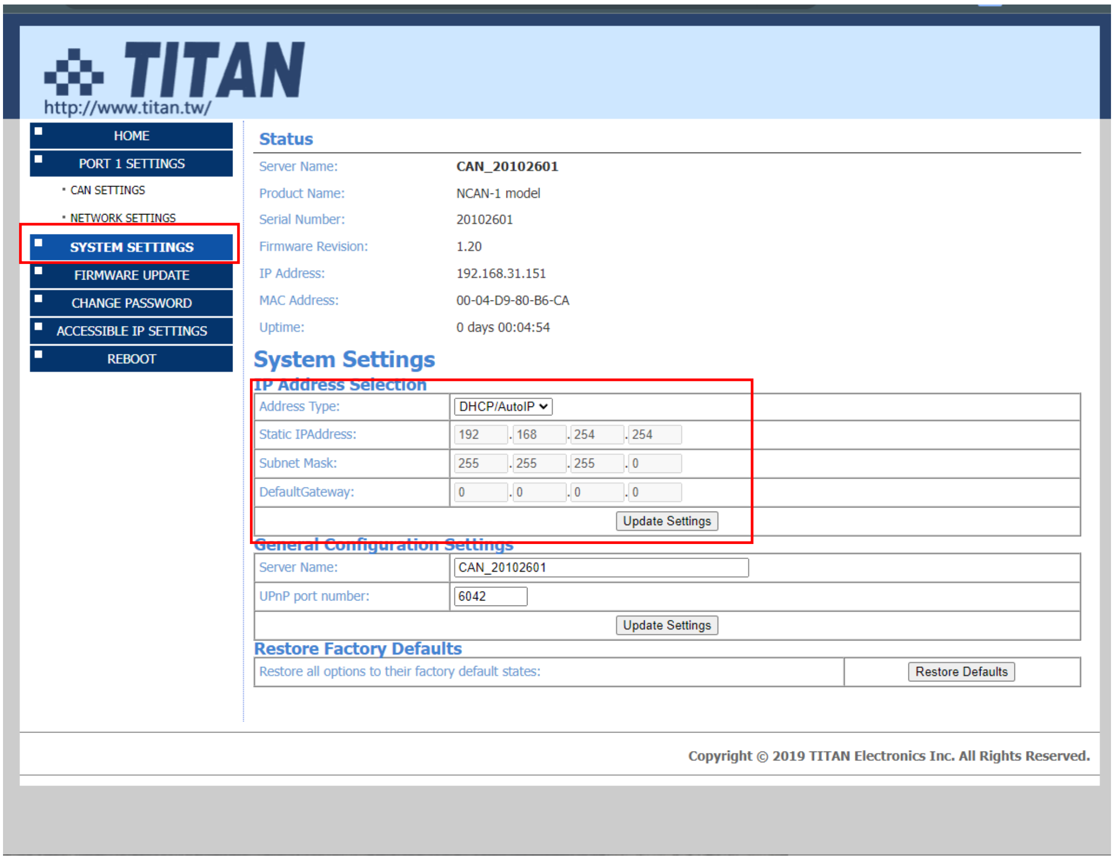
4.3 Setting NCAN-1 to Work in DHCP Networks

Many networks are DHCP networks, which assign IP addresses for client computers and NCAN-1 automatically, in which case you would need to set the NCAN-1's IP address to DHCP/AutoIP mode.

Under the "HOME" page of NCAN-1's firmware, select "SYSTEM SETTINGS". Under "Address Type:" select "DHCP/AutoIP" and click "Update Settings". After clicking "OK", NCAN-1 will be set to DHCP mode.



Status

Server Name:	CAN_20102601
Product Name:	NCAN-1 model
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00-04-D9-80-B6-CA
Uptime:	0 days 00:04:54

System Settings

IP Address Selection

Address Type:	DHCP/AutoIP
Static IPAddress:	192 . 168 . 254 . 254
Subnet Mask:	255 . 255 . 255 . 0
DefaultGateway:	0 . 0 . 0 . 0

General Configuration Settings

Server Name:	CAN_20102601
UPnP port number:	6042

Restore Factory Defaults

Restore all options to their factory default states:

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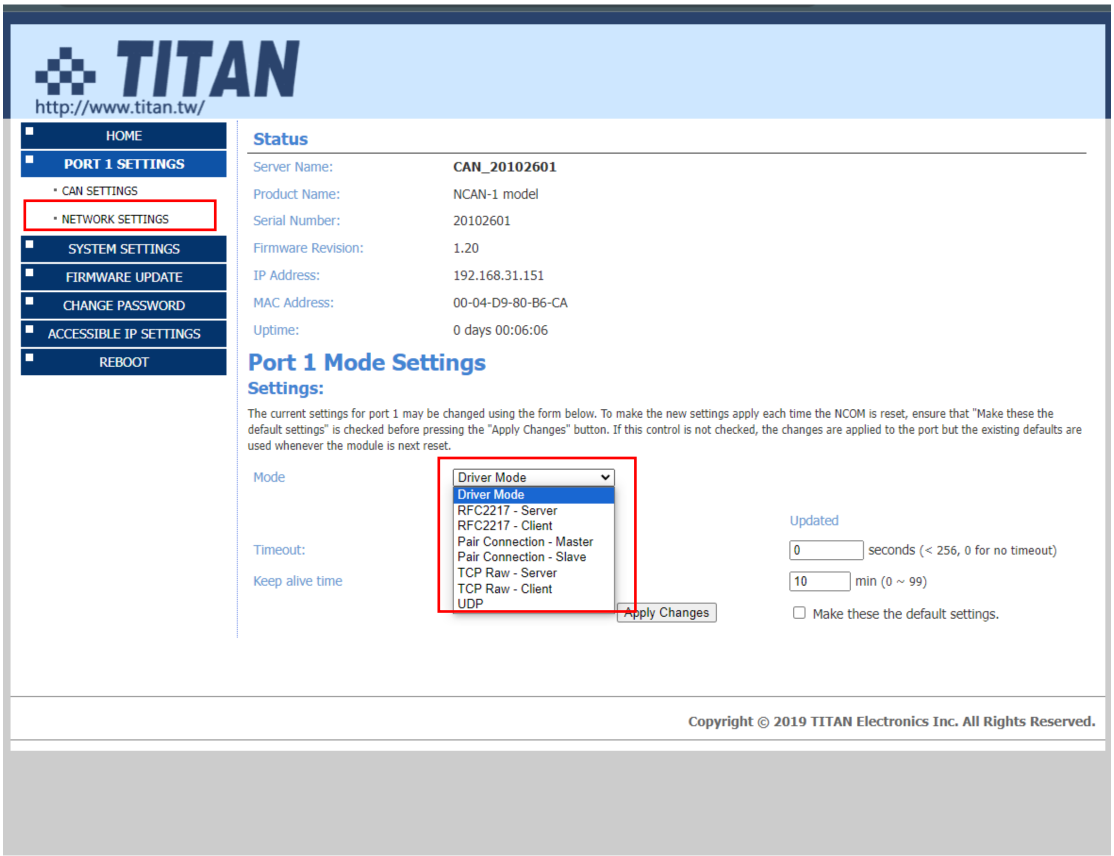
5. SETTING THE PROPER OPERATION MODE

NCAN-1 provides various operation modes, including Driver Mode, RFC2217 Server Mode, RFC2217 Client Mode, Pair Connection Master Mode, Pair Connection Slave Mode, TCP Raw Server Mode, TCP Raw Client Mode and UDP Mode. You need to choose the proper operation mode to control your serial devices located virtually anywhere through a network connection.

Under the "HOME" page of NCAN-1's firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select the proper operation mode, check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 in the proper operation mode.



Status

Server Name:	CAN_20102601
Product Name:	NCAN-1 model
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00-04-D9-80-B6-CA
Uptime:	0 days 00:06:06

Port 1 Mode Settings

Settings:

The current settings for port 1 may be changed using the form below. To make the new settings apply each time the NCOM is reset, ensure that "Make these the default settings" is checked before pressing the "Apply Changes" button. If this control is not checked, the changes are applied to the port but the existing defaults are used whenever the module is next reset.

Mode: Driver Mode

Updated

Timeout: 0 seconds (< 256, 0 for no timeout)

Keep alive time: 10 min (0 ~ 99)

□ Make these the default settings.

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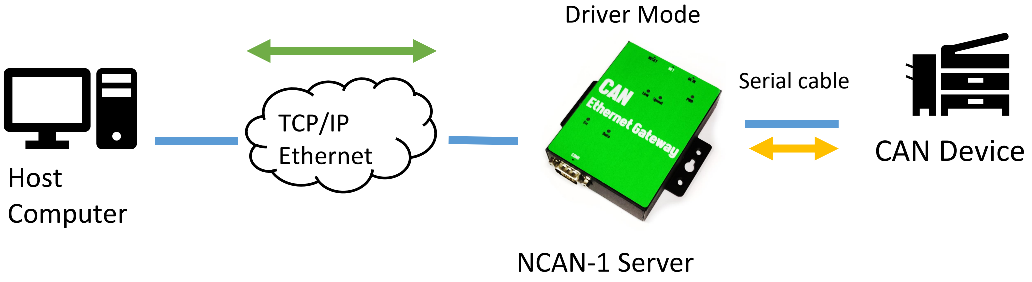
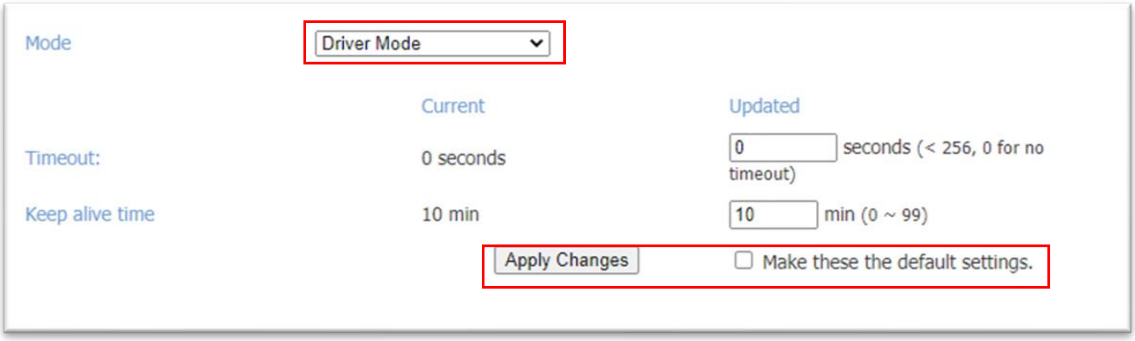
5.1 Driver Mode

Driver mode uses a virtual serial redirection driver installed on Windows systems. The virtual serial redirection driver establishes a transparent connection between host computers and serial devices. This allows users to communicate using serial hardware and serial communication software, with the virtual serial port acting as a native Windows COM port compatible with Windows serial communication applications.



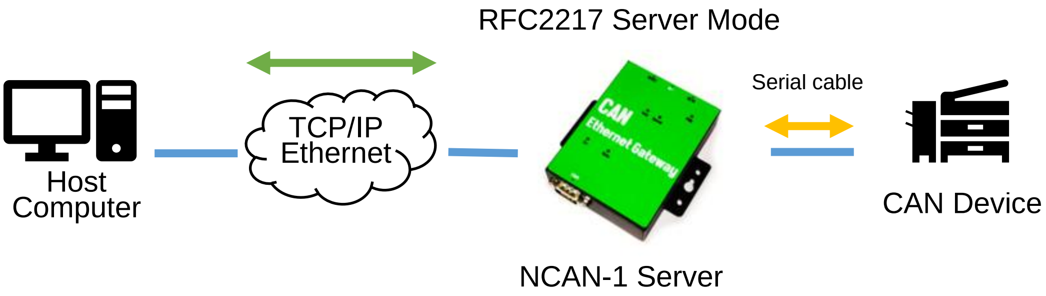
Under the "HOME" page of NCAN-1's firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select "Driver Mode" and check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 into Driver Mode.



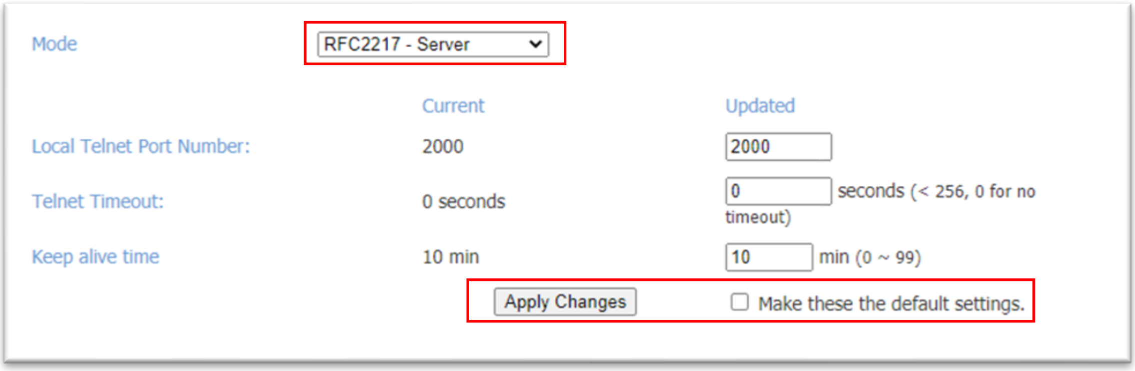
Mode	Driver Mode	
	Current	Updated
Timeout:	0 seconds	0 seconds (< 256, 0 for no timeout)
Keep alive time	10 min	10 min (0 ~ 99)
	Apply Changes	□ Make these the default settings.

5.2 RFC2217 Server Mode

RFC2217 Server Mode is similar to Driver Mode, which also uses a virtual serial redirection driver to establish a transparent connection between host computers and serial devices. The RFC2217 Mode defines general COM port control options based on the standard Telnet protocol, which allows users to use anything that supports RFC2217 protocol's virtual serial redirection driver (such as com0com + com2tcp for Windows OS and microcom for Linux OS). The virtual serial port functions as a native COM port.



Under the "HOME" page of NCAN-1's firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select "RFC2217-Server" and check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 into RFC2217 Server Mode.

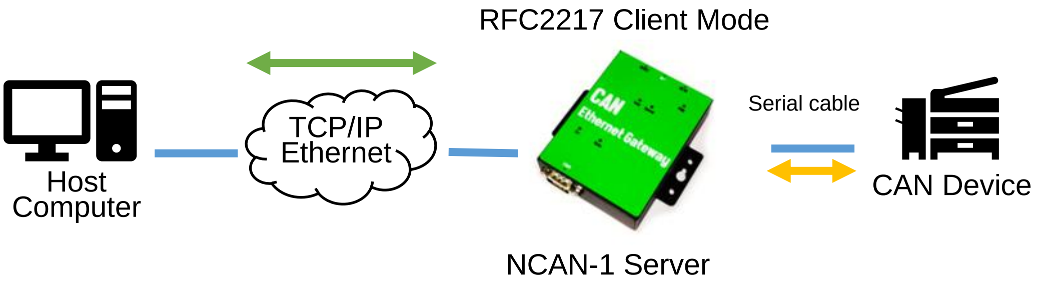


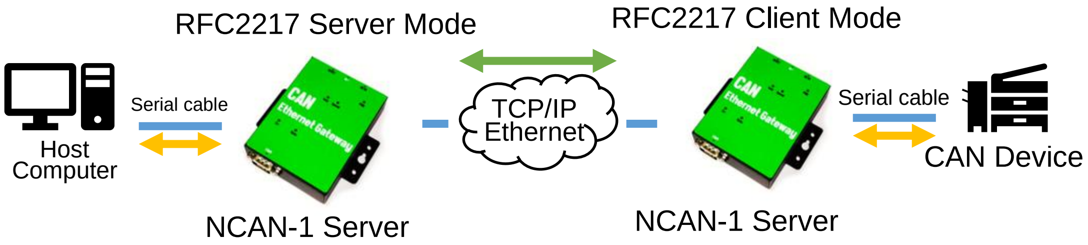
Mode: RFC2217 - Server

	Current	Updated
Local Telnet Port Number:	2000	2000
Telnet Timeout:	0 seconds	0 seconds (< 256, 0 for no timeout)
Keep alive time	10 min	10 min (0 ~ 99)

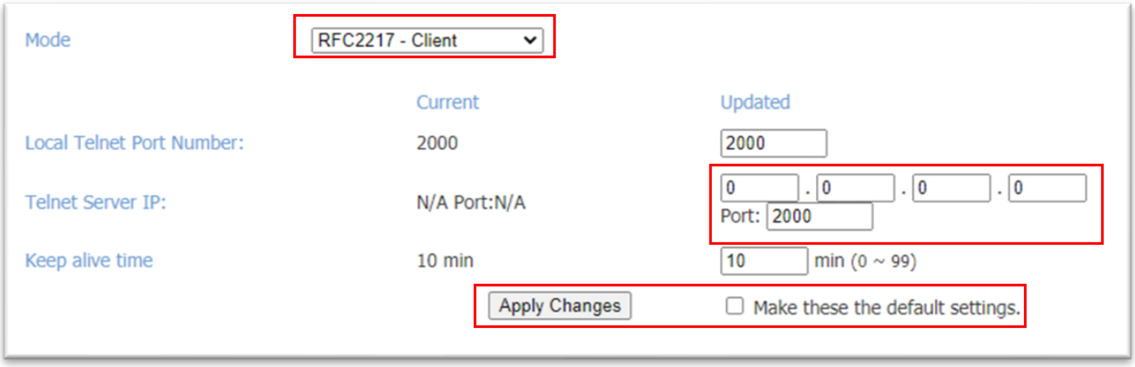
5.3 RFC2217 Client Mode

In RFC2217 Client Mode, NCAN-1 can establish a TCP connection with a pre-determined host computer or a CAN to Ethernet Gateway working in RFC2217 Server Mode. You need to define the IP address (telnet server's IP) to establish a TCP connection with a pre-determined host computer or a CAN to Ethernet Gateway.





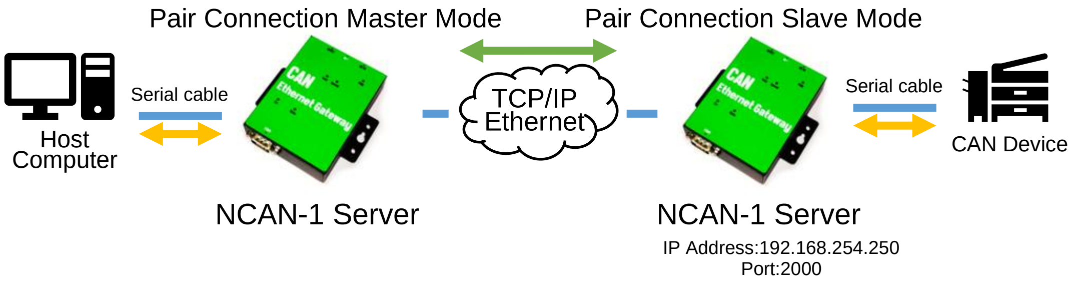
Under the "HOME" page of NCAN-1's firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select "RFC2217-Client" and type "Telnet Server's IP" and "Port" respectively (e.g. 192.168.1.147 Port: 2000) to establish a TCP connection with a pre-determined host computer or a CAN to Ethernet Gateway. Check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 into RFC2217 Client Mode.



Mode	RFC2217 - Client	
	Current	Updated
Local Telnet Port Number:	2000	2000
Telnet Server IP:	N/A Port:N/A	0 . 0 . 0 . 0 Port: 2000
Keep alive time	10 min	10 min (0 ~ 99)
	Apply Changes	□ Make these the default settings.

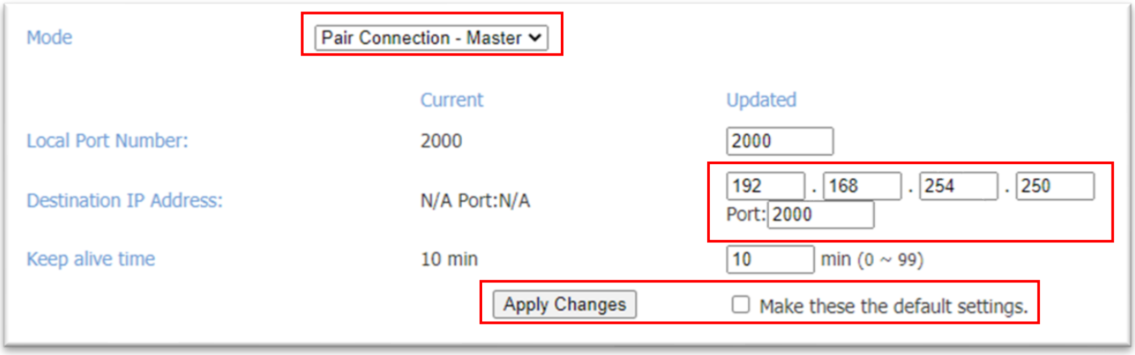
5.4 Pair Connection Mode

Pair Connection Mode uses two NCAN CAN to Ethernet Gateway in tandem, with one NCOM device in Pair Connection Master Mode and the other in Pair Connection Slave Mode. Two NCAN CAN to Ethernet Gateway are then connected to each other through Ethernet. Both may either be connected to the same LAN or over a WAN (i.e. through one or more routers). Pair Connection Mode transparently transfers serial data a without distance limitation.



When setting two NCAN-1 devices in Pair Connection Mode, you need to set the “Destination IP Address” of the master NCAN CAN to Ethernet Gateway as the IP address of the slave NCAN CAN to Ethernet Gateway.

Under the “HOME” page of NCAN’s firmware, select “NETWORK SETTINGS” to find the “Port 1 Mode Settings” window. Under “Mode”, select “Pair Connection - Master” and type “Destination IP address” and “Port” of the slave CAN to Ethernet Gateway respectively (e.g. 192.168.254.250 Port: 2000) to connect to a CAN to Ethernet Gateway in Pair Connection Slave Mode. Check the “Make these the default settings” box and click “Apply Changes” to set two NCAN devices in Pair Connection Mode.



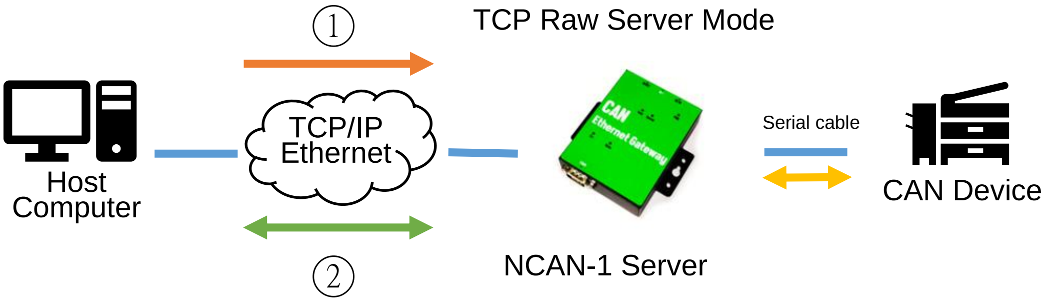
Mode: Pair Connection - Master

	Current	Updated
Local Port Number:	2000	2000
Destination IP Address:	N/A Port:N/A	192 . 168 . 254 . 250 Port: 2000
Keep alive time	10 min	10 min (0 ~ 99)

□ Make these the default settings.

5.5 TCP Raw Server Mode

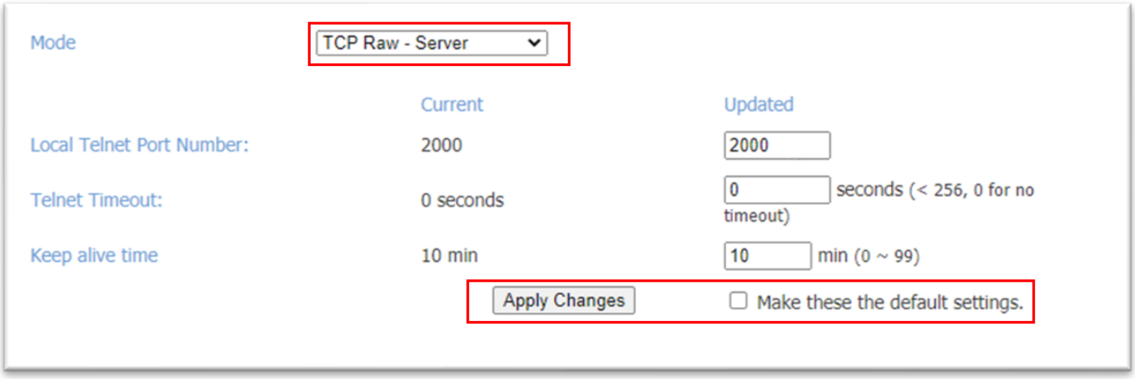
In TCP Raw Server Mode, NCAN-1 is configured with a unique IP & Port combination on a TCP/IP network. It waits passively to be contacted by a host computer. After a host computer establishes a transparent connection, it then proceeds with data transmission.



In the figure, the data transmission proceeds as follows:

1. The host computer requests a connection from NCAN-1 configured for TCP Raw Server Mode.
2. Once the connection is established, data can be transmitted in both directions – from the host computer to NCAN-1 and from NCAN-1 to the host computer.

Under the “HOME” page of NCAN-1’s firmware, select “NETWORK SETTINGS” to find the “Port 1 Mode Settings” window. Under “Mode”, select “TCP Raw - Server” and check the “Make these the default settings” box and click “Apply Changes” to set your NCAN-1 into TCP Raw - Server Mode.

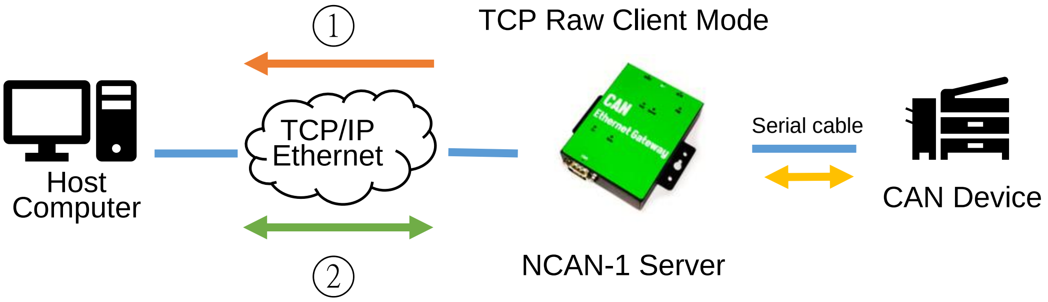


Mode: TCP Raw - Server

	Current	Updated
Local Telnet Port Number:	2000	2000
Telnet Timeout:	0 seconds	0 seconds (< 256, 0 for no timeout)
Keep alive time	10 min	10 min (0 ~ 99)

5.6 TCP Raw Client Mode

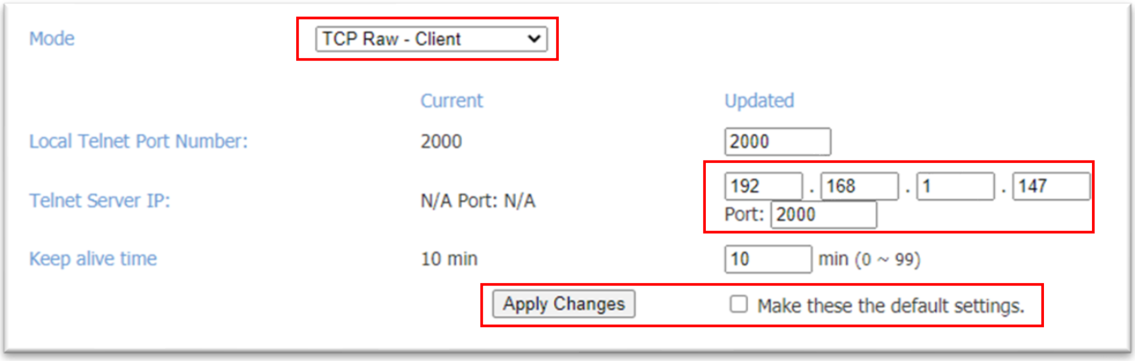
In TCP Raw Client Mode, NCAN-1 can establish a TCP connection with pre-determined host computers when serial data arrives.



In the figure, the data transmission proceeds as follows:

1. NCAN-1 configured for TCP Raw Client Mode requests a connection from the host computer.
2. Once the connection is established, data can be transmitted in both directions – from the host computer to NCAN-1 and from NCAN-1 to the host computer.

Under the "HOME" page of NCAN-1 firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select "TCP Raw - Client" and type "Telnet Server's IP" and "Port" respectively (e.g. 192.168.1.147 Port: 2000) to establish a TCP connection with a pre-determined host computer or a CAN to Ethernet Gateway in TCP Raw Server Mode. Check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 into TCP Raw Client Mode.



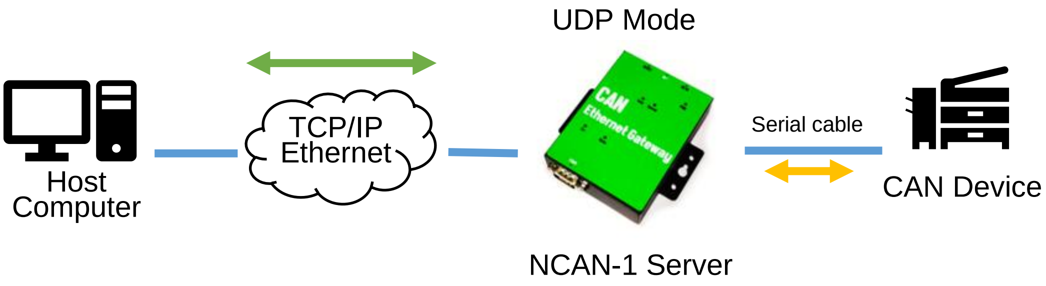
Mode: TCP Raw - Client

	Current	Updated
Local Telnet Port Number:	2000	2000
Telnet Server IP:	N/A Port: N/A	192 . 168 . 1 . 147 Port: 2000
Keep alive time	10 min	10 min (0 ~ 99)

Apply Changes ☐ Make these the default settings.

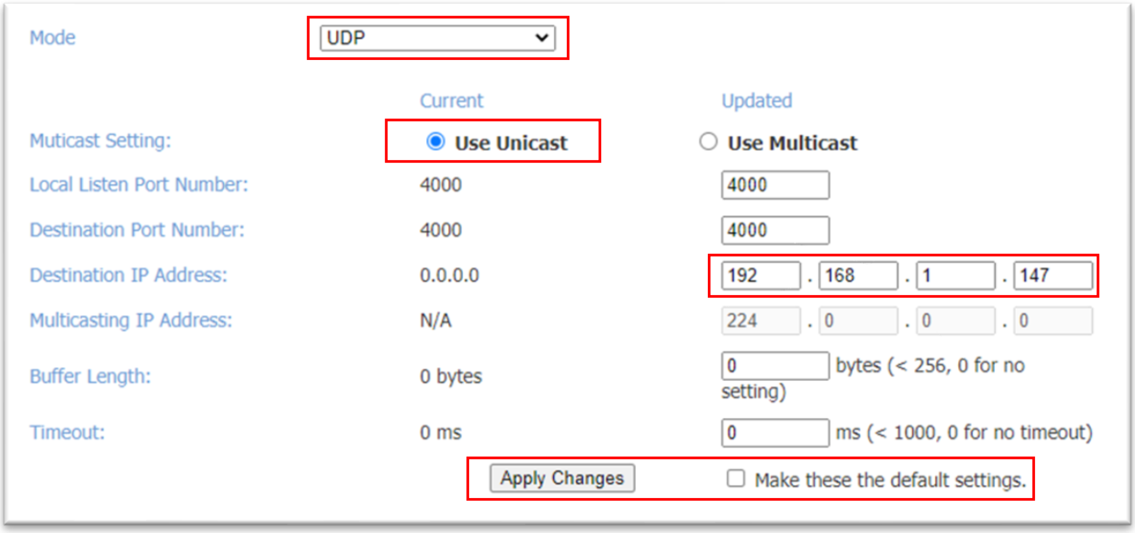
5.7 UDP Mode

The UDP mode is a faster and more efficient mode. In UDP mode, you can unicast or multicast data from the serial device to one or multiple host computers or receive data from one or multiple host computers. The UDP mode is ideal for applications such as message display.

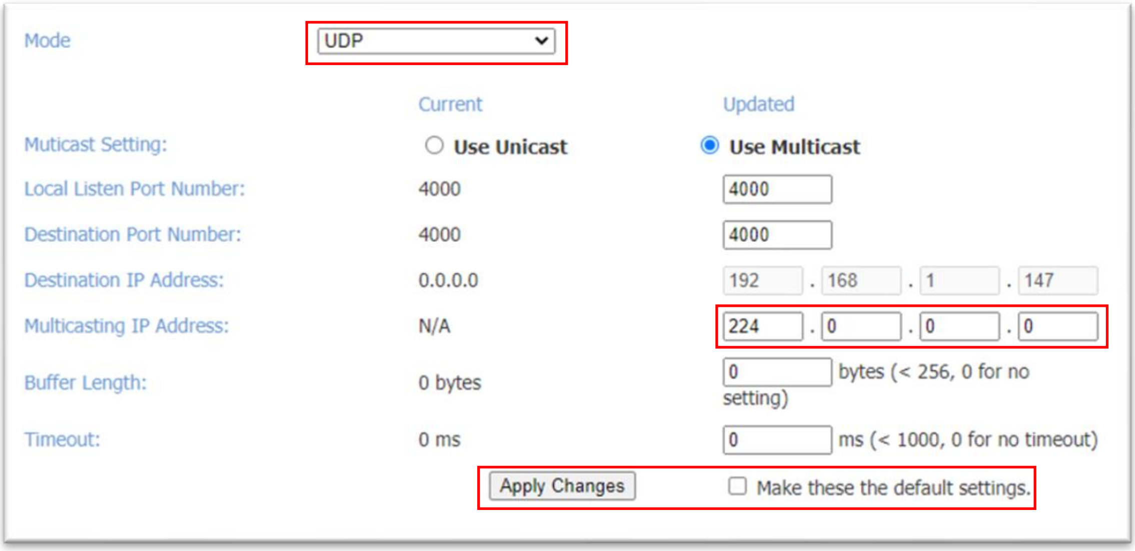


In the figure, UDP mode directly proceeds with data transmission with no connection required.

Under the "HOME" page of NCAN-1's firmware, select "NETWORK SETTINGS" to find the "Port 1 Mode Settings" window. Under "Mode", select "UDP" and choose "Use Unicast" or "Use Multicast" under "Multicast Setting". When selecting "Use Unicast", you need to type a "Destination IP Address" (such as 192.168.1.147) to establish a UDP connection with a pre-determined host computer or serial device in UDP unicasting mode. When selecting "Use Multicast", you need to type "Multicasting IP Address" (such as 224.0.0.0) for UDP multicasting group. Check the "Make these the default settings" box and click "Apply Changes" to set your NCAN-1 into UDP Mode.



Mode	UDP	
	Current	Updated
Muticast Setting:	● Use Unicast	○ Use Multicast
Local Listen Port Number:	4000	4000
Destination Port Number:	4000	4000
Destination IP Address:	0.0.0.0	192 . 168 . 1 . 147
Multicasting IP Address:	N/A	224 . 0 . 0 . 0
Buffer Length:	0 bytes	0 bytes (< 256, 0 for no setting)
Timeout:	0 ms	0 ms (< 1000, 0 for no timeout)
	Apply Changes	□ Make these the default settings.



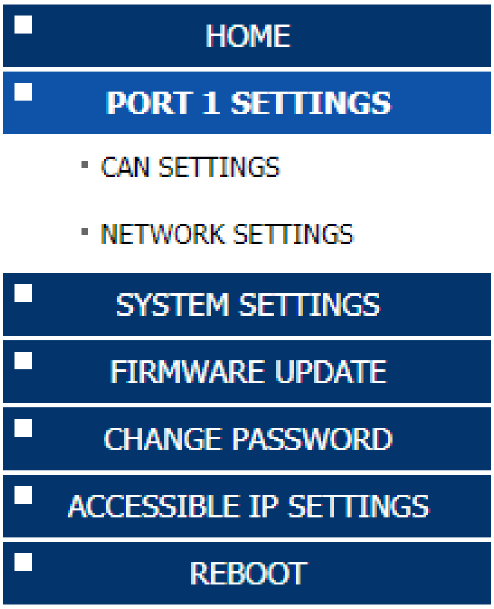
Mode: UDP

	Current	Updated
Muticast Setting:	○ **Use Unicast**	● **Use Multicast**
Local Listen Port Number:	4000	4000
Destination Port Number:	4000	4000
Destination IP Address:	0.0.0.0	192 . 168 . 1 . 147
Multicasting IP Address:	N/A	224 . 0 . 0 . 0
Buffer Length:	0 bytes	0 bytes (< 256, 0 for no setting)
Timeout:	0 ms	0 ms (< 1000, 0 for no timeout)

□ Make these the default settings.

6. WEB CONSOLE CONFIGURATION INTERFACE

The web console interface allows configuration of NCAN-1. These settings include "PORT 1 SETTINGS" and "PORT 2 SETTINGS" ("CAN SETTINGS" & "NETWORK SETTINGS"), "SYSTEM SETTINGS", "FIRMWARE UPDATE", "CHANGE PASSWORD", "ACCESSIBLE IP SETTINGS" and "REBOOT".

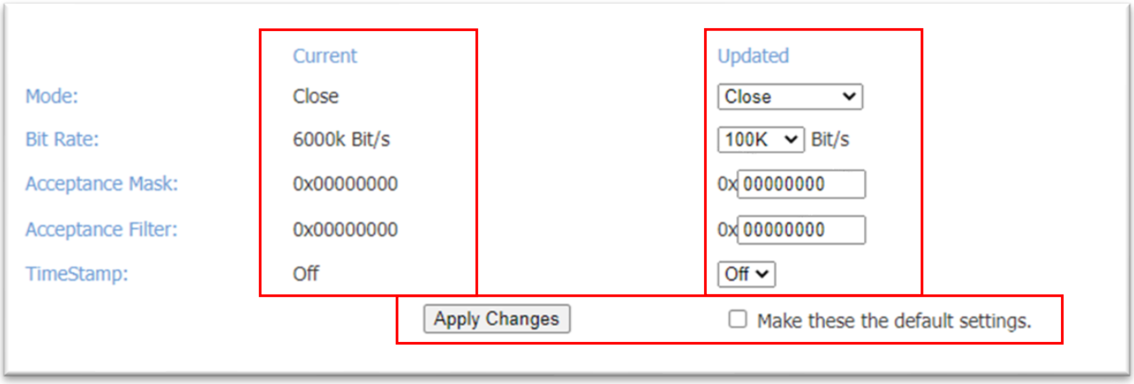


To access the web console interface to configure the device, open any web browser and enter NCAN-1's IP address in the address bar to access the "HOME" page of NCAN-1's firmware.

6.1 Port 1 Settings

The “PORT 1 SETTINGS” include “CAN SETTINGS” and “NETWORK SETTINGS”.

Click “CAN SETTINGS” to display the current CAN bus settings for NCAN-1. To modify the CAN bus settings for a particular port, select appropriate options located on the right side of “Port 1 CAN Settings”.



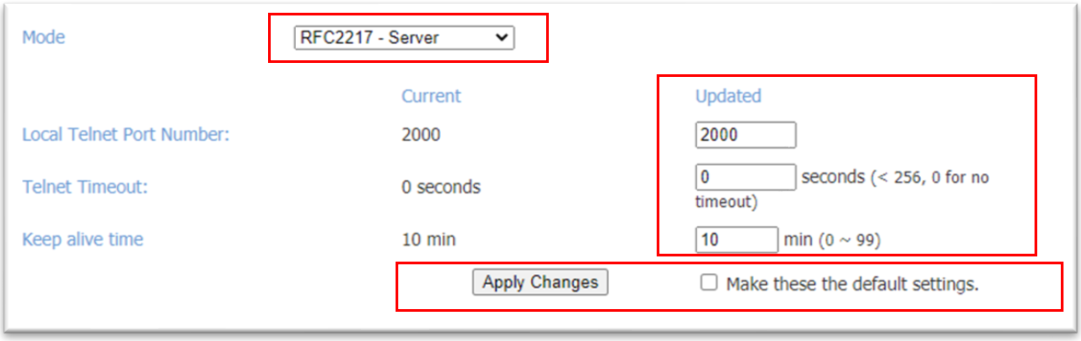
	Current	Updated
Mode:	Close	Close
Bit Rate:	6000k Bit/s	100K Bit/s
Acceptance Mask:	0x00000000	0x 00000000
Acceptance Filter:	0x00000000	0x 00000000
TimeStamp:	Off	Off

You can modify the following serial parameters for your NCAN-1 CAN to Ethernet Gateway:

CAN Parameters	Setting	Default Values
Mode	Close, Normal Mode, Listen Only, Loopback	Close
Bit Rate	10K to 1000K bit/s	100Kbit/s
Acceptance Mask	0x00000000~0x1FFFFFFF	0x00000000
Acceptance Filter	0x00000000~0x1FFFFFFF	0x00000000
TimeStamp	Off, On	Off

After you modify the CAN parameters for your NCAN-1, please check the “Make these the default settings” and click “Submit” to update the CAN parameters for your device.

Click “NETWORK SETTINGS” to display the current network settings for NCAN-1. To modify the operation mode, refer to Chapter 5 for more detailed information. You can also modify the network parameters of NCAN-1. To modify the network parameter settings, select appropriate options located on the right side of “Port 1 Mode Settings”. Options include “Local Telnet Port Number”, “Telnet Timeout”, and “Keep alive time”.



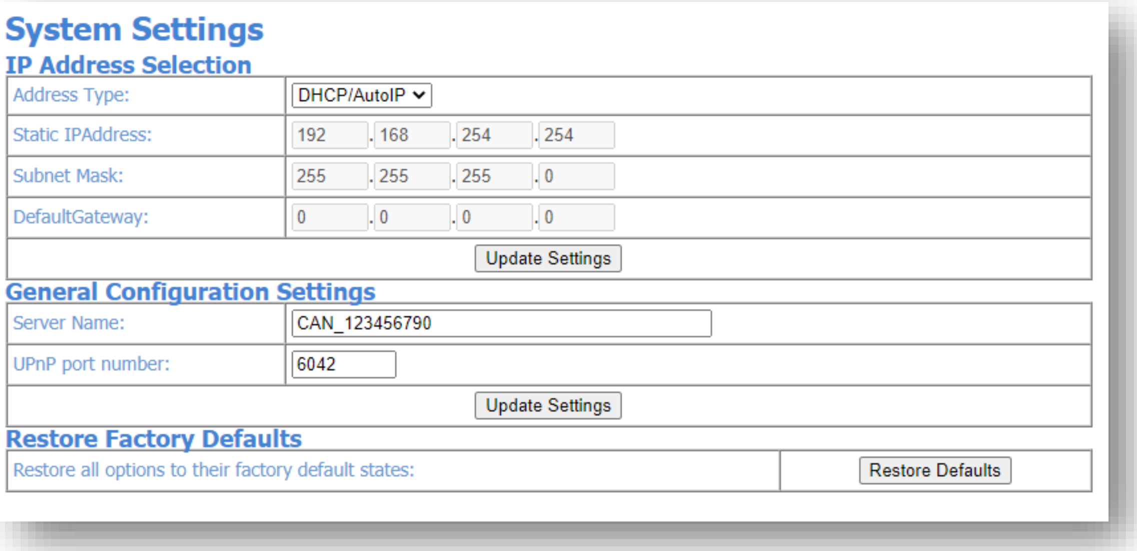
Mode: RFC2217 - Server

	Current	Updated
Local Telnet Port Number:	2000	2000
Telnet Timeout:	0 seconds	0 seconds (< 256, 0 for no timeout)
Keep alive time	10 min	10 min (0 ~ 99)

After you modify the network parameters for your NCAN-1, please check the “Make these the default settings” and click “Apply Changes” to update the network parameters for your device.

6.2 System Settings

The "SYSTEM SETTINGS" for NCAN-1 includes "IP Address Selection", "General Configuration Settings" and "Restore Factory Defaults".



System Settings

IP Address Selection

Address Type:	DHCP/AutoIP
Static IPAddress:	192 . 168 . 254 . 254
Subnet Mask:	255 . 255 . 255 . 0
DefaultGateway:	0 . 0 . 0 . 0

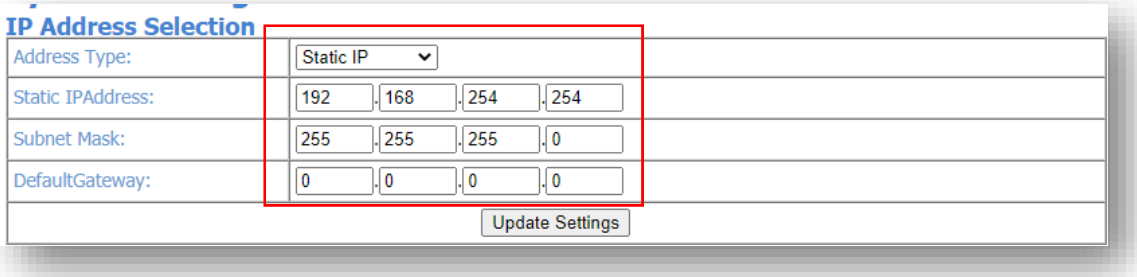
General Configuration Settings

Server Name:	CAN_123456790
UPnP port number:	6042

Restore Factory Defaults

Restore all options to their factory default states:

Click "Address Type", located under "IP Address Selection", to select IP address type (DHCP/AutoIP or Static IP) for NCAN-1. When you select "Static IP", you need to enter the static IP address (such as 192.168.254.254) and Subnet Mask (such as 255.255.255.0) then click "Update Settings" to set your device to static IP address.



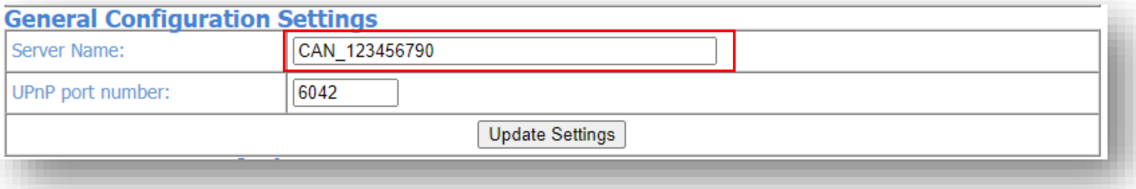
IP Address Selection

Address Type:	Static IP
Static IPAddress:	192 . 168 . 254 . 254
Subnet Mask:	255 . 255 . 255 . 0
DefaultGateway:	0 . 0 . 0 . 0

Note: The NCAN-1's default IP address is 192.168.254.254

If you are working in a DHCP network, you need to select "DHCP/AutoIP" and click "Update Settings" to assign IP address for the NCAN-1 automatically.

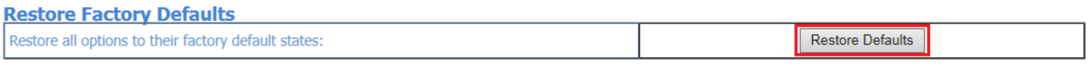
You can change NCAN CAN to Ethernet Gateway's name by modifying the "Server Name" under "General Configuration Settings". You need to enter a new name (such as NCAN-1) and click "Update Settings" to set your CAN to Ethernet Gateway to a new name.



General Configuration Settings

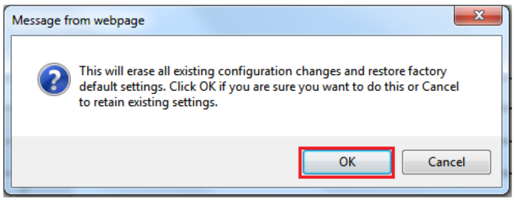
Server Name:	CAN_123456790
UPnP port number:	6042

The NCAN-1's firmware provides a function to restore settings to factory defaults. You can do so by clicking "Restore Defaults" under "Restore Factory Defaults". After clicking "OK", NCAN-1 will restore all options to factory default states.



Restore Factory Defaults

Restore all options to their factory default states:



Message from webpage

This will erase all existing configuration changes and restore factory default settings. Click OK if you are sure you want to do this or Cancel to retain existing settings.

Following are the values of default states:

Network Parameters	Default Values
Mode	Driver Mode
Timeout	0 seconds
Keep alive time	10 minutes
Address Type	Static IP
Static IP address	192.168.254.254
Subnet Mask	255.255.255.0

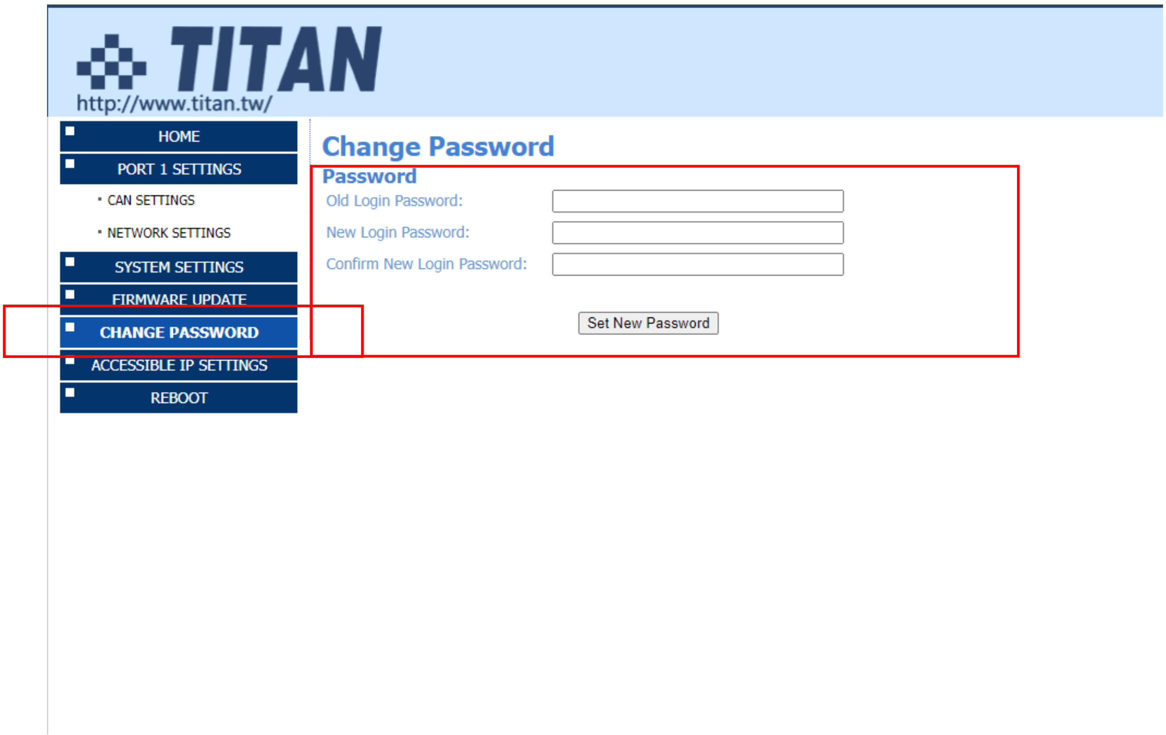
CAN Bus Parameters	Default Values
Mode	Close
Bit Rate	100Kbit/s
Acceptance Mask	0x00000000
Acceptance Filter	0x00000000
TimeStamp	Off

6.3 Firmware Update

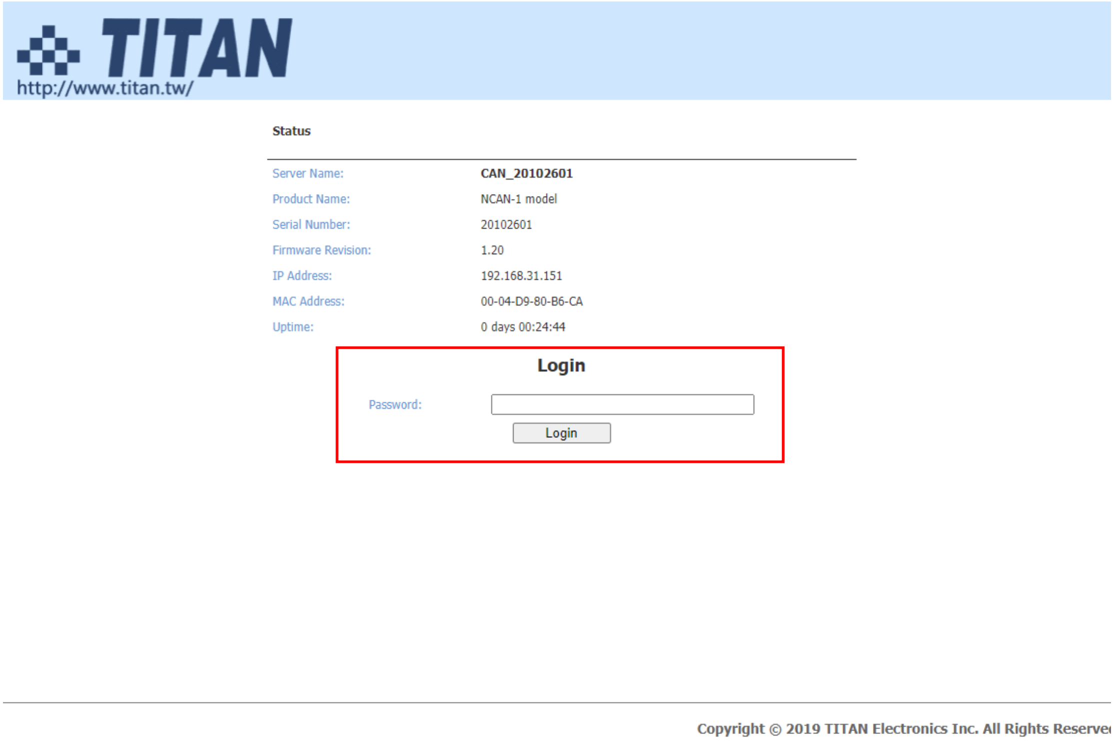
please refer to 8.7.4.5 for instructions on how to launch the firmware update tool program to upgrade NCAN-1’s firmware.

6.4 Change Password

Input the “Old Login Password”, “New Login Password” and “Confirm New Login Password” to change the login password. After clicking “Set New Password” the NCAN-1 will have password protection.



When password protection is enabled, you need to input the “Password” then click “Login” to access NCAN-1’s firmware to configure the device.



Status

Server Name:	CAN_20102601
Product Name:	NCAN-1 model
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00-04-D9-80-B6-CA
Uptime:	0 days 00:24:44

Login

Password:

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If you **forget the password**, the ONLY way to configure NCAN-1 is by using the reset button to restore factory defaults (press the hardware reset button until the “PWR” LED flashes). The factory default settings have password protection disabled, allowing you to log in without a password.

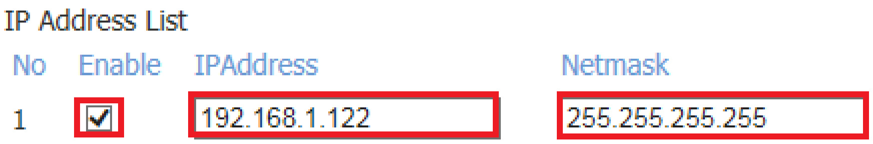
6.5 Accessible IP Settings

The NCAN-1's firmware provides accessible IP settings. It uses an IP address based filtering method to control accessible IP addresses.

Accessible IP settings allow you to pass or block remote host IP addresses to prevent unauthorized access. Access to NCAN-1 is controlled by IP address. If a host's IP address is in the accessible IP table, then the host will be allowed to access the device. You can allow one of the following rules by setting the accessible IP table parameter.

1. Only one host with a specific IP address can access NCAN-1.

Check the "Enable" checkbox then enter IP address and "255.255.255.255" for Netmask.



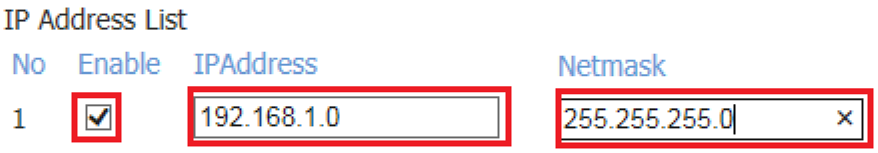
IP Address List

No	Enable	IPAddress	Netmask
1	☑	192.168.1.122	255.255.255.255

In this example, only the host with an IP address of 192.168.1.122 can access the device.

2. Hosts on a specific subnet can access NCAN-1.

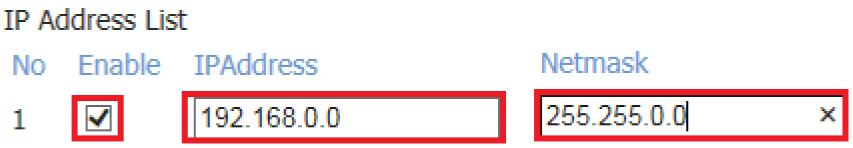
Check the "Enable" checkbox then enter IP address and "255.255.255.0" for Netmask.



IP Address List

No	Enable	IPAddress	Netmask
1	☑	192.168.1.0	255.255.255.0

In this example, only hosts with an IP address from 192.168.1.1 to 192.168.1.254 can access the device.



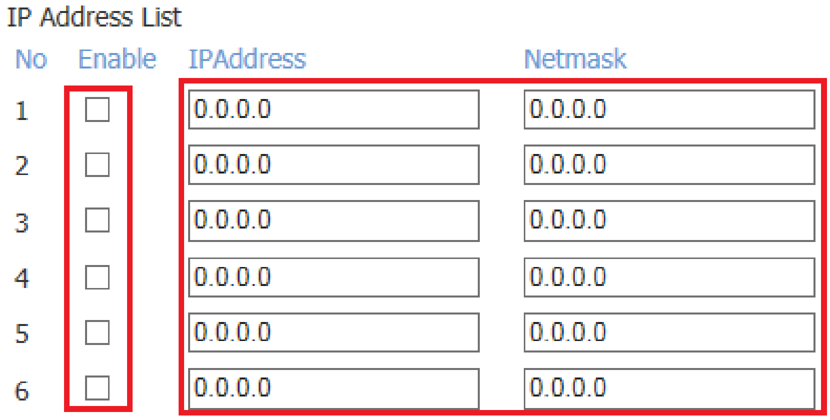
IP Address List

No	Enable	IPAddress	Netmask
1	☑	192.168.0.0	255.255.0.0

In this example, only hosts with an IP address from 192.168.0.1 to 192.168.255.254 can access the device.

3. Any host can access NCAN-1.

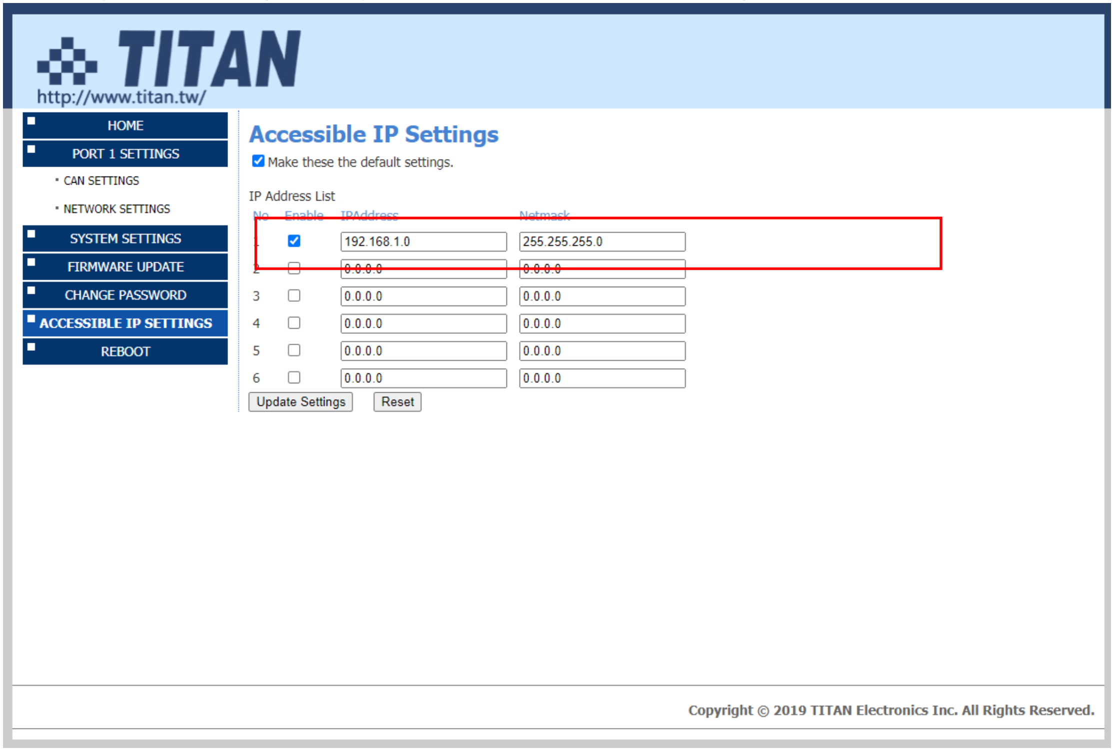
Disable this function by unchecking “Enable”.



IP Address List

No	Enable	IPAddress	Netmask
1	☐	0.0.0.0	0.0.0.0
2	☐	0.0.0.0	0.0.0.0
3	☐	0.0.0.0	0.0.0.0
4	☐	0.0.0.0	0.0.0.0
5	☐	0.0.0.0	0.0.0.0
6	☐	0.0.0.0	0.0.0.0

After you enter “IP address” and “Netmask” to set accessible IP for your NCAN-1 CAN to Ethernet Gateway, please check the “Make these the default settings” and click “Update Settings” to update the accessible IP settings table for NCAN-1.



Accessible IP Settings

☑ Make these the default settings.

IP Address List

No	Enable	IPAddress	Netmask
1	☑	192.168.1.0	255.255.255.0
2	☐	0.0.0.0	0.0.0.0
3	☐	0.0.0.0	0.0.0.0
4	☐	0.0.0.0	0.0.0.0
5	☐	0.0.0.0	0.0.0.0
6	☐	0.0.0.0	0.0.0.0

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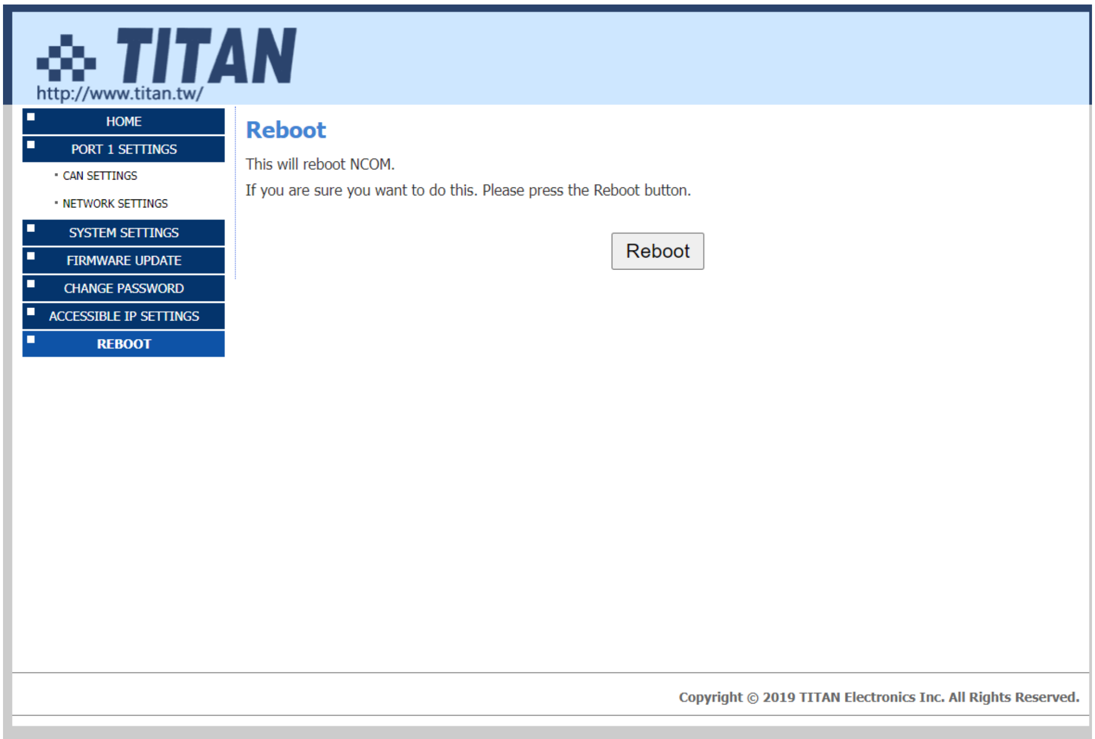
You can click “Reset” to allow any host to access NCAN-1. The default accessible IP setting is to allow all hosts to access.

6.6 Reboot

You can click “Reboot” to reboot your NCAN-1 CAN to Ethernet Gateway.



Reboot

This will reboot NCOM.

If you are sure you want to do this. Please press the Reboot button.

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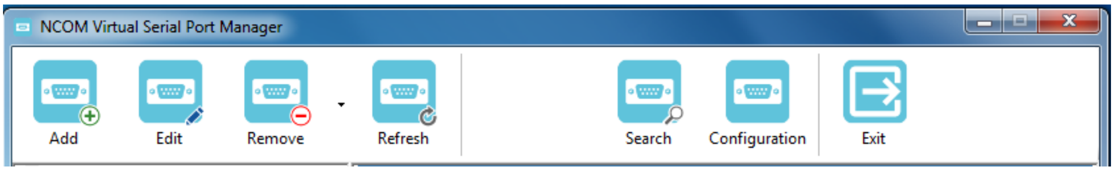
7. NCOM VIRTUAL SERIAL PORT MANAGER AND DRIVER INSTALLATION

7.1 NCOM Virtual Serial Port Manager and Virtual Serial Port Driver

Note: The virtual serial port driver is bundled with NCOM Virtual Serial Port Manager and is automatically installed when you install NCOM Virtual Serial Port Manager!

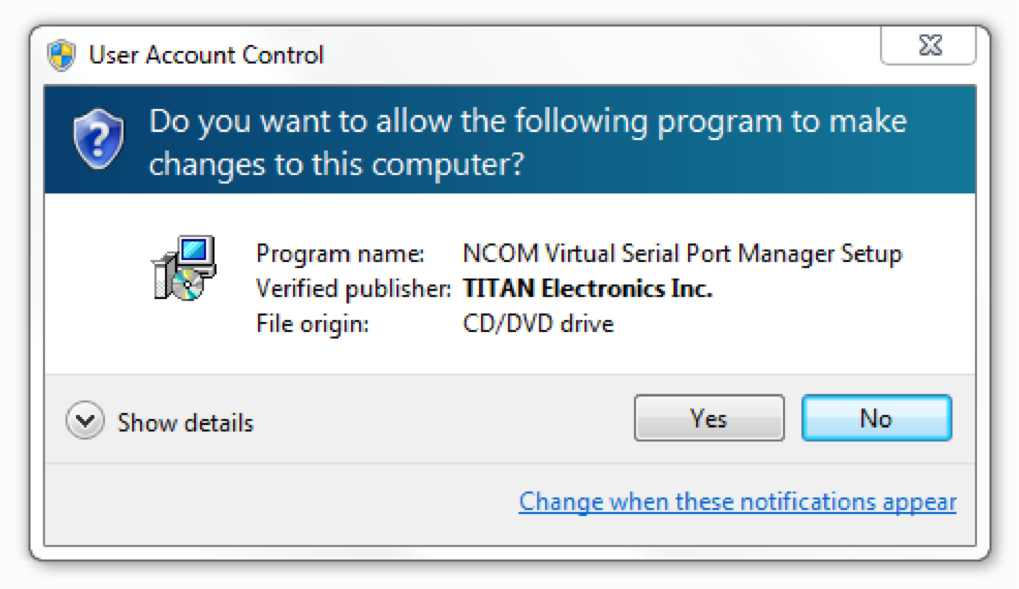
The NCOM Virtual Serial Port Manager is an advanced software-based solution that allows you to communicate with CAN to Ethernet Gateway over networks easily. Thus, any serial device connected to your NCOM CAN to Ethernet Gateway could be accessed from anywhere in the world (via internet or LAN) as if it were attached directly to the remote PC.

When the attached serial port device sends communication data, it is transmitted over TCP/IP network and back from the network to your serial device. NCOM Virtual Serial Port Manager has options to configure NCAN-1 with the options “Add” (add virtual serial port), “Edit” (edit virtual serial port parameters), “Remove” (remove virtual serial port), “Refresh” (refresh virtual serial port), “Search” (search all attached NCAN CAN to Ethernet Gateway), “Configuration” (configure virtual serial port parameters) and “Exit” (exit NCOM Virtual Serial Port Manager).



7.2 Installing NCOM Virtual Serial Port Manager

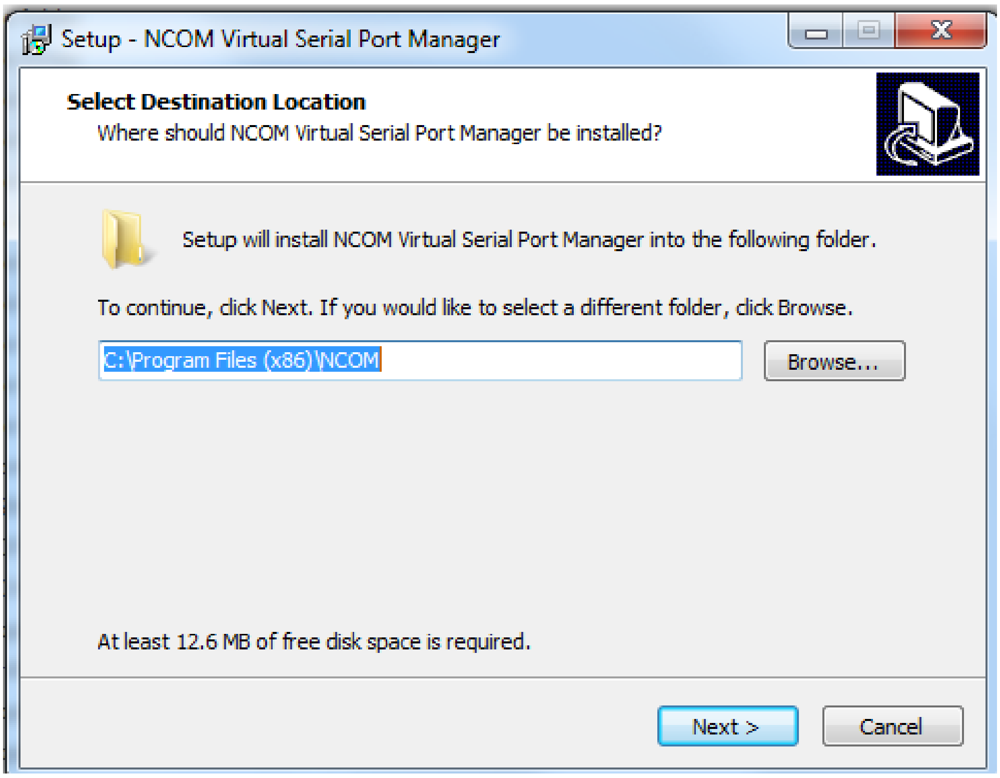
1. Insert the software CD into your CD-ROM or DVD-ROM drive.
2. Open files in the CD and double click “NCOM_setup” to install NCOM Virtual Serial Port Manager.
3. When the confirmation for “User Account Control” appears, click “Yes” and the “Setup - NCOM Virtual Serial Port Manager” message appears. Click X



User Account Control

Do you want to allow the following program to make changes to this computer?

Program name: NCOM Virtual Serial Port Manager Setup
Verified publisher: **TITAN Electronics Inc.**
File origin: CD/DVD drive



Setup - NCOM Virtual Serial Port Manager

Select Destination Location
Where should NCOM Virtual Serial Port Manager be installed?

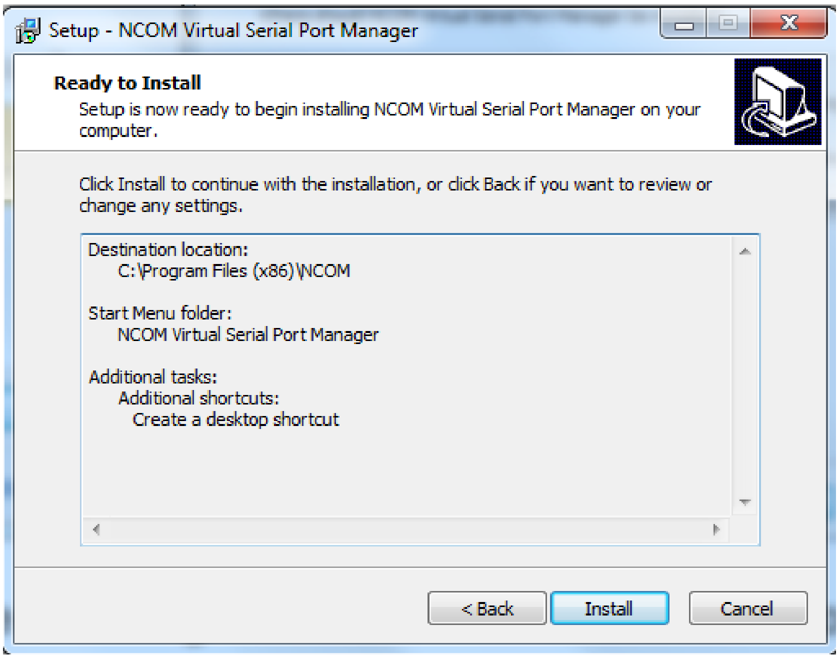
Setup will install NCOM Virtual Serial Port Manager into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Program Files (x86)\NCOM

At least 12.6 MB of free disk space is required.

4. After you click “Next”, you will see following information. Click on “Next” and the “Ready to Install” message appears. Click “Install” to install NCOM Virtual Serial Port Manager.



Setup - NCOM Virtual Serial Port Manager

Ready to Install

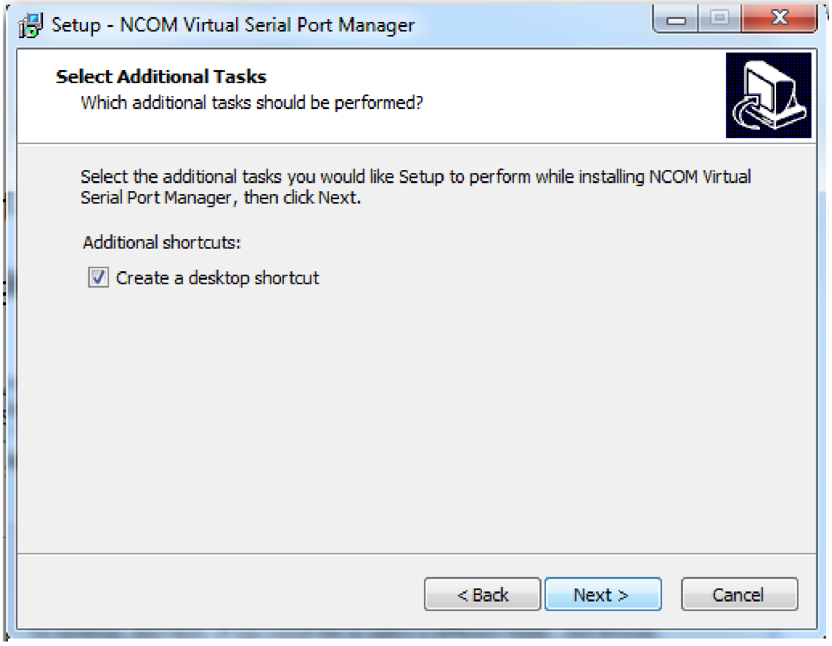
Setup is now ready to begin installing NCOM Virtual Serial Port Manager on your computer.

Click Install to continue with the installation, or click Back if you want to review or change any settings.

Destination location:
C:\Program Files (x86)\NCOM

Start Menu folder:
NCOM Virtual Serial Port Manager

Additional tasks:
Additional shortcuts:
Create a desktop shortcut



Setup - NCOM Virtual Serial Port Manager

Select Additional Tasks

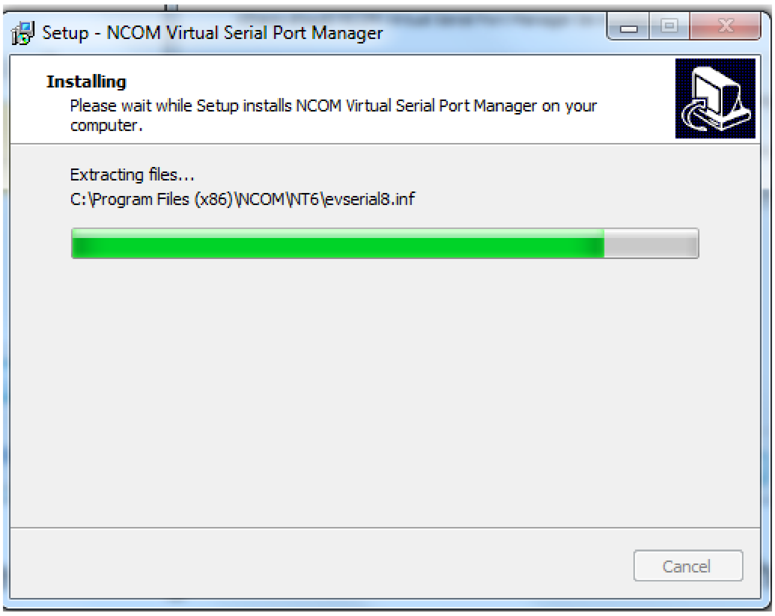
Which additional tasks should be performed?

Select the additional tasks you would like Setup to perform while installing NCOM Virtual Serial Port Manager, then click Next.

Additional shortcuts:

☑ Create a desktop shortcut

5. After you click “Install” to install NCOM Virtual Serial Port Manager and virtual serial port driver for NCAN CAN to Ethernet Gateway, you will see the following information.



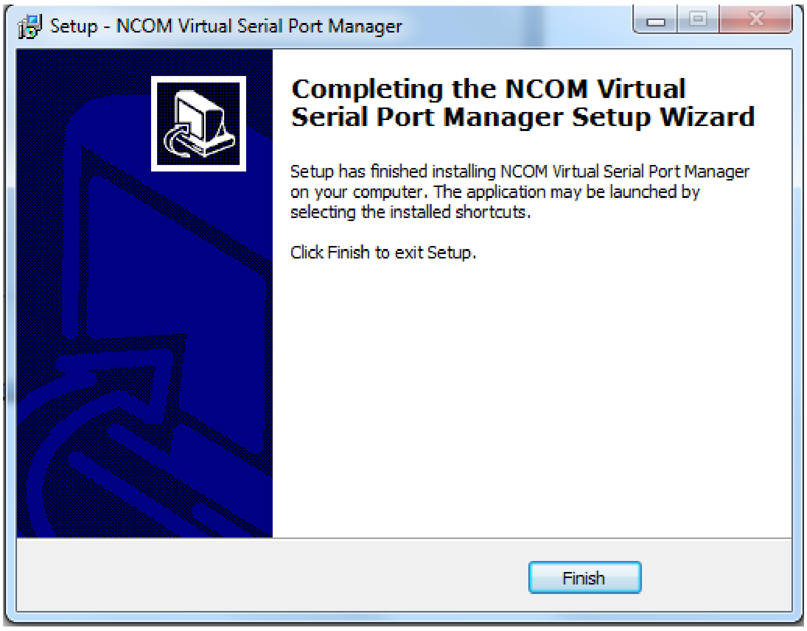
Setup - NCOM Virtual Serial Port Manager

Installing

Please wait while Setup installs NCOM Virtual Serial Port Manager on your computer.

Extracting files...
C:\Program Files (x86)\NCOM\NT6\evserial8.inf

6. When the message "Completing the NCOM Virtual Serial Port Manager Setup Wizard" appears, click "Finish" to finish the installation and exit setup program.



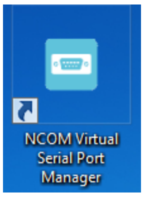
Setup - NCOM Virtual Serial Port Manager

Completing the NCOM Virtual Serial Port Manager Setup Wizard

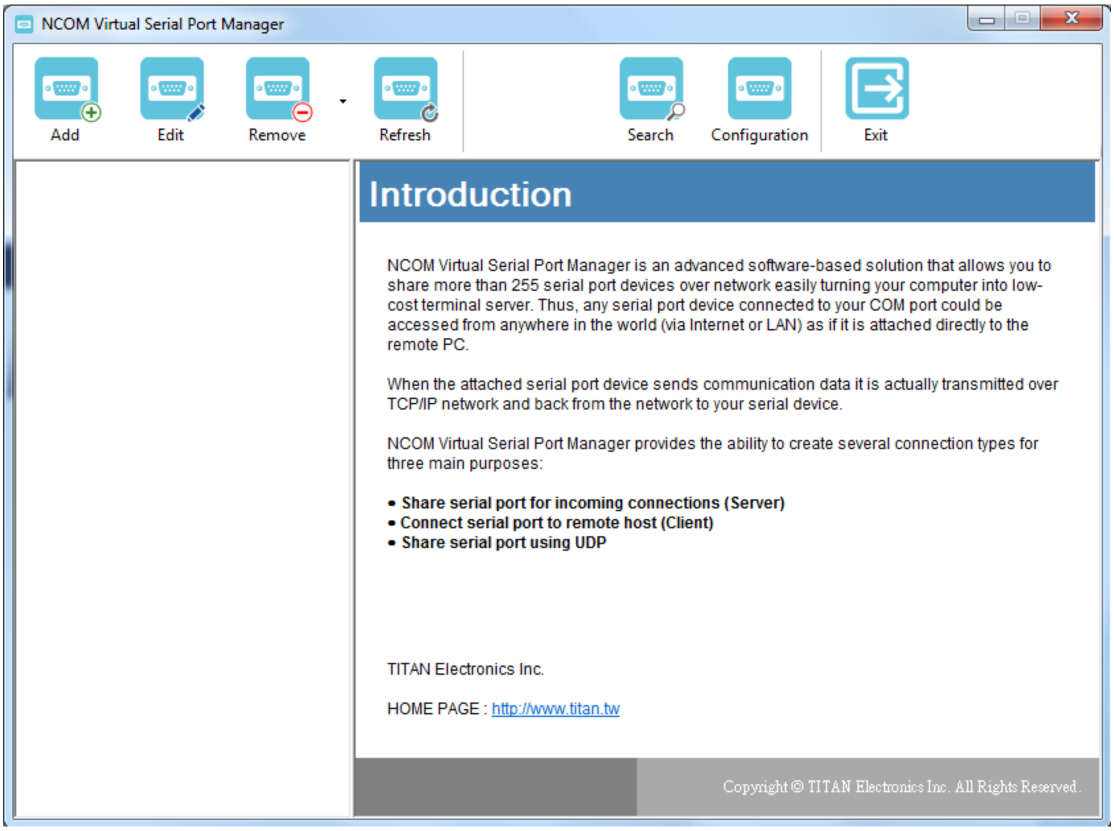
Setup has finished installing NCOM Virtual Serial Port Manager on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

7. Double click the shortcut icon of "NCOM Virtual Serial Port Manager" on the desktop to launch NCOM Virtual Serial Port Manager.



8. You will see the main window of NCOM Virtual Serial Port Manager.



Introduction

NCOM Virtual Serial Port Manager is an advanced software-based solution that allows you to share more than 255 serial port devices over network easily turning your computer into low-cost terminal server. Thus, any serial port device connected to your COM port could be accessed from anywhere in the world (via Internet or LAN) as if it is attached directly to the remote PC.

When the attached serial port device sends communication data it is actually transmitted over TCP/IP network and back from the network to your serial device.

NCOM Virtual Serial Port Manager provides the ability to create several connection types for three main purposes:

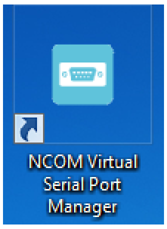
- **Share serial port for incoming connections (Server)**
- **Connect serial port to remote host (Client)**
- **Share serial port using UDP**

TITAN Electronics Inc.

HOME PAGE : http://www.titan.tw

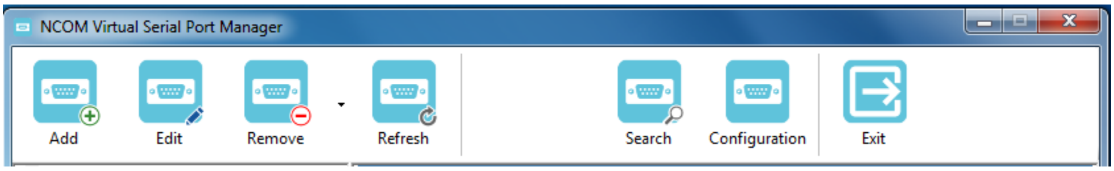
8. RUNNING NCOM VIRTUAL SERIAL PORT MANAGER

After installing NCAN-1 hardware and NCOM Virtual Serial Port Manager, double click the shortcut icon of “NCOM Virtual Serial Port Manager” on the Desktop to start NCOM Virtual Serial Port Manager.



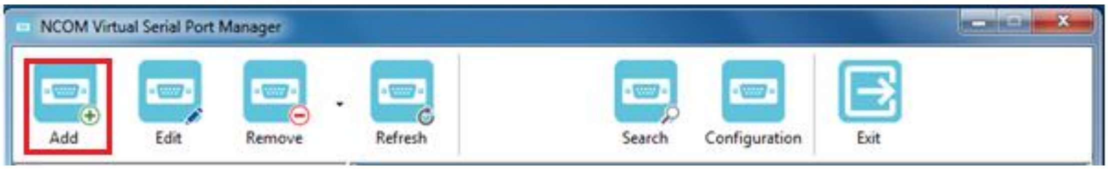
8.1 NCOM Virtual Serial Port Manager Functions

NCOM Virtual Serial Port Manager has options to configure NCAN-1 with the options “Add” (add virtual serial port), “Edit” (edit virtual serial port parameters), “Remove” (remove virtual serial port), “Refresh” (refresh virtual serial port), “Search” (search all attached NCAN CAN to Ethernet Gateway), “Configuration” (configure virtual serial port parameters) and “Exit” (exit NCOM Virtual Serial Port Manager).

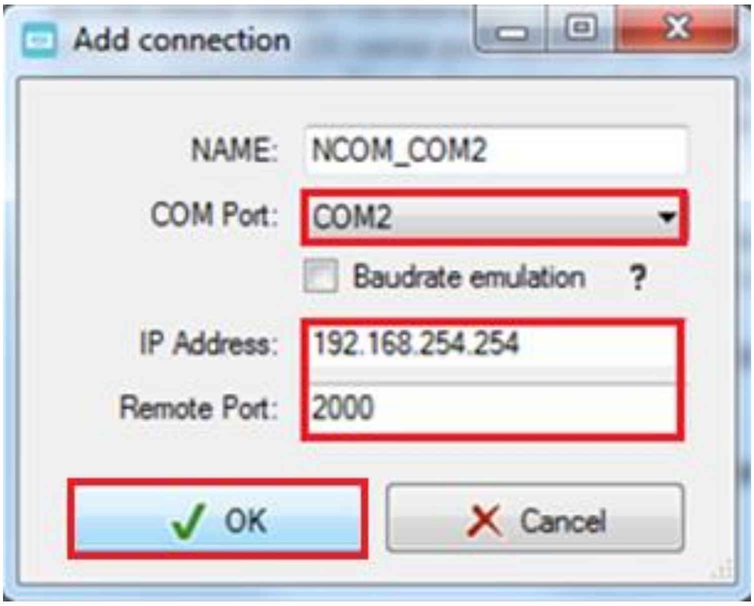


8.2 Manually Add Virtual Serial Port for NCAN

After opening NCOM Virtual Serial Port Manager, click “Add” to open the “Add connection” window.



Under “Add connection”, select an available COM port (e.g. COM2. Note that NCOM Virtual Serial Port Manager will show your next available COM port) and type your NCOM device’s IP address and port in “IP Address” and “Remote Port” respectively (e.g. IP Address: 192.168.254.254 Port: 2000). After setting the COM port, IP address and remote port, click “OK” to add a new virtual serial port.



NAME: NCOM_COM2

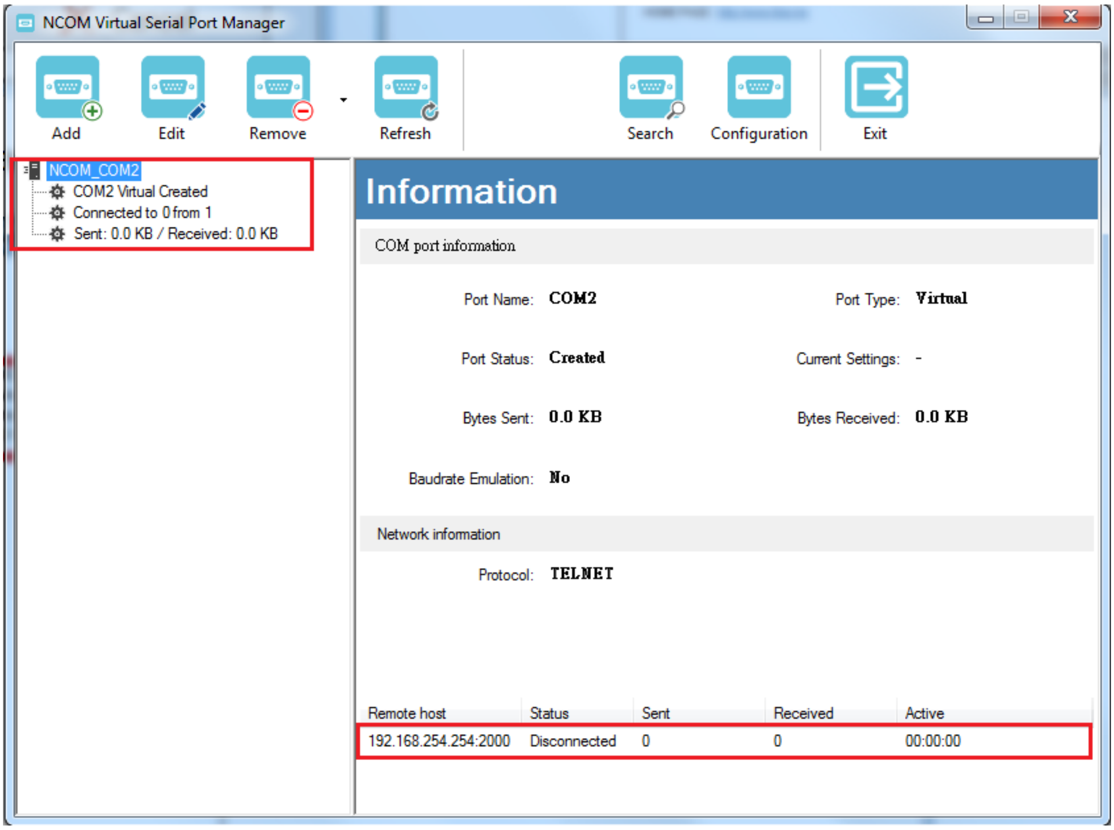
COM Port: COM2

□ Baudrate emulation ?

IP Address: 192.168.254.254

Remote Port: 2000

After adding a new virtual serial port for NCAN CAN to Ethernet Gateway, you will find information about the virtual serial port in the main window of NCOM Virtual Serial Port Manager.



NCOM_COM2

- COM2 Virtual Created
- Connected to 0 from 1
- Sent: 0.0 KB / Received: 0.0 KB

Information

COM port information

Port Name: **COM2**

Port Type: **Virtual**

Port Status: **Created**

Current Settings: -

Bytes Sent: **0.0 KB**

Bytes Received: **0.0 KB**

Baudrate Emulation: **No**

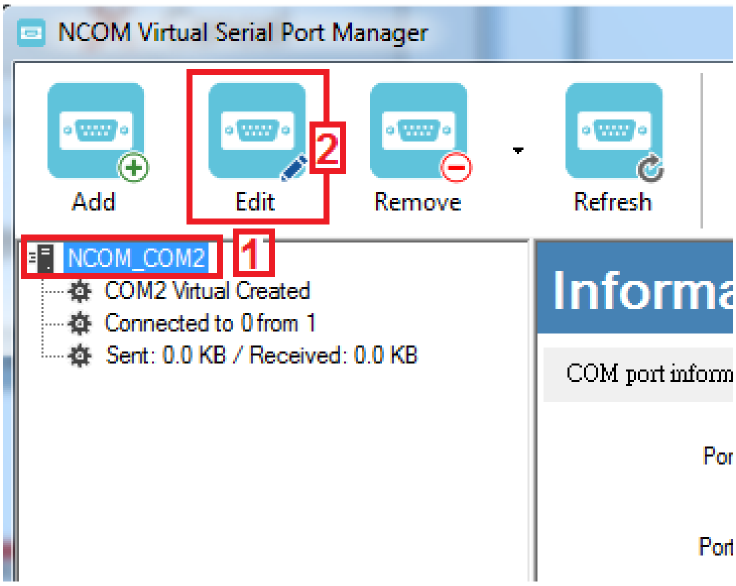
Network information

Protocol: **TELNET**

Remote host	Status	Sent	Received	Active
192.168.254.254:2000	Disconnected	0	0	00:00:00

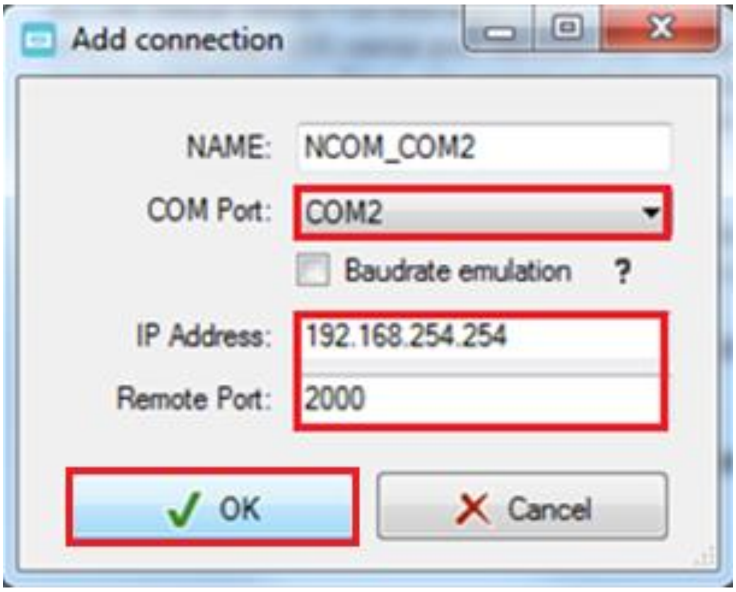
8.3 Manually Edit Existing Virtual Serial COM Ports for NCAN

To edit existing virtual serial COM port for NCAN CAN to Ethernet Gateway, select the existing virtual serial COM port and click "Edit" to open the "Add connection" window.



NCOM_COM2
- COM2 Virtual Created
- Connected to 0 from 1
- Sent: 0.0 KB / Received: 0.0 KB

Under "Add connection", you can change the COM port number with the "COM Port" option (e.g. changing from COM2 to COM3) or change the IP address and remote port with the "IP Address" and "Remote Port" options respectively. After you change the settings, click "OK" to confirm the changes of the virtual serial port for NCAN CAN to Ethernet Gateway.



NAME: NCOM_COM2

COM Port: COM2

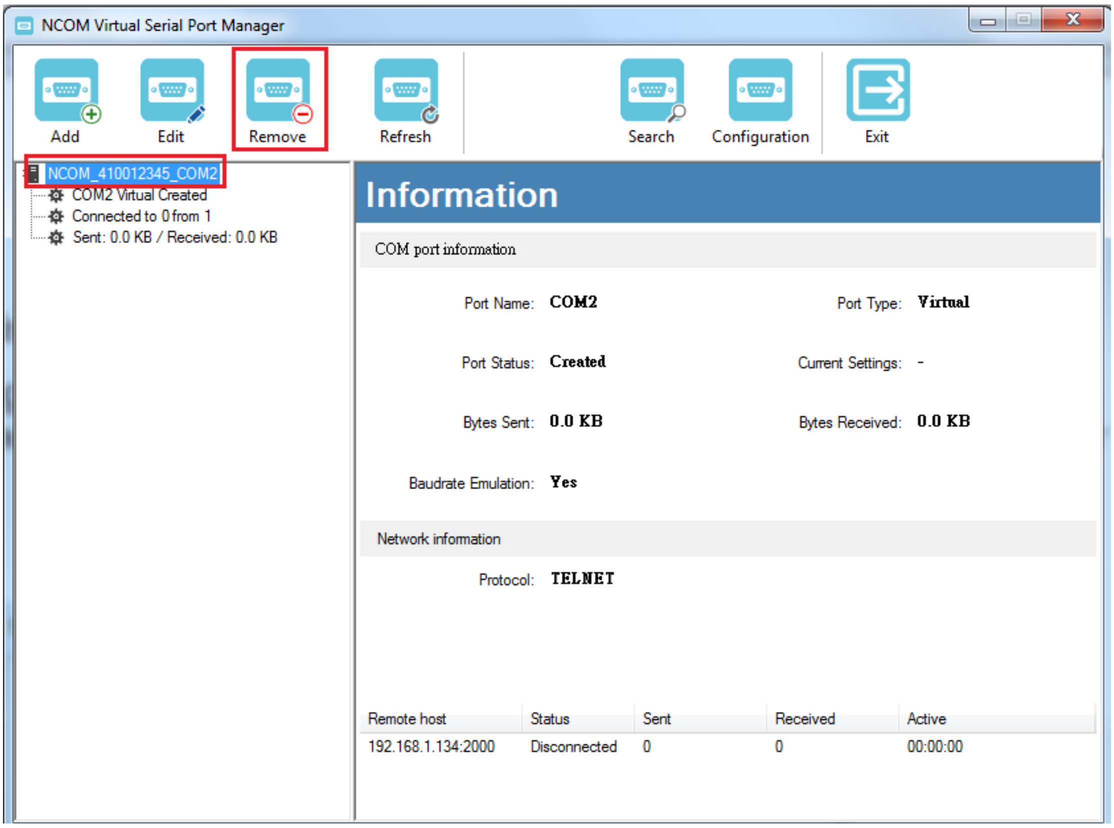
☐ Baudrate emulation ?

IP Address: 192.168.254.254

Remote Port: 2000

8.4 Manually Remove Existing Virtual Serial COM Ports for NCAN

To remove an existing virtual serial port for NCAN CAN to Ethernet Gateway, select an existing virtual serial port and click “Remove”.



NCOM_410012345_COM2
- COM2 Virtual Created
- Connected to 0 from 1
- Sent: 0.0 KB / Received: 0.0 KB

Information

COM port information

Port Name: COM2 Port Type: Virtual

Port Status: Created Current Settings: -

Bytes Sent: 0.0 KB Bytes Received: 0.0 KB

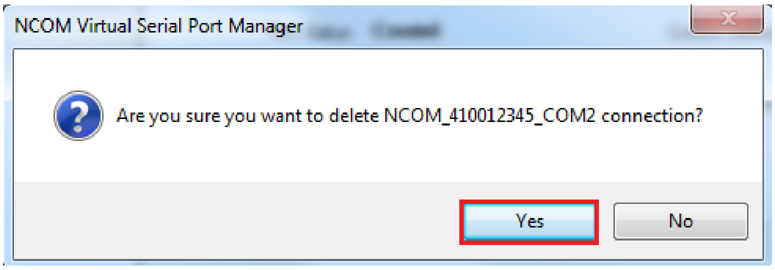
Baudrate Emulation: Yes

Network information

Protocol: TELNET

Remote host	Status	Sent	Received	Active
192.168.1.134:2000	Disconnected	0	0	00:00:00

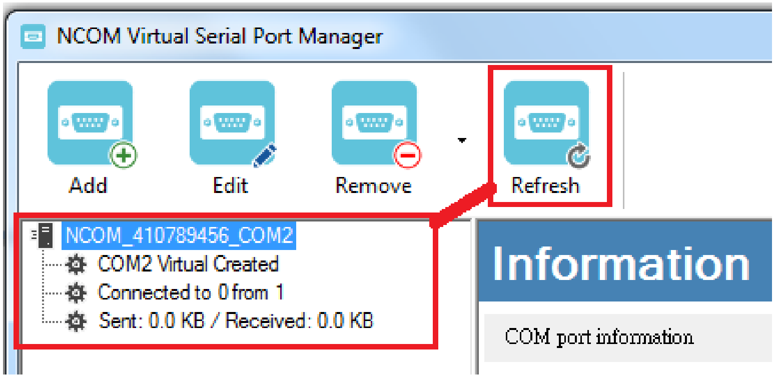
After clicking “Remove”, a confirmation message will appear asking “Are you sure you want to delete NCOM_XXXXXXXX_COMX connection?”. Confirm by clicking on “Yes”.



Are you sure you want to delete NCOM_410012345_COM2 connection?

8.5 Refreshing Virtual Serial Port Information

The virtual serial port information on the main window of NCOM Virtual Serial Port Manager may be incorrect or absent in some cases. In case this happens, you can click “Refresh” to recover the virtual serial port information.



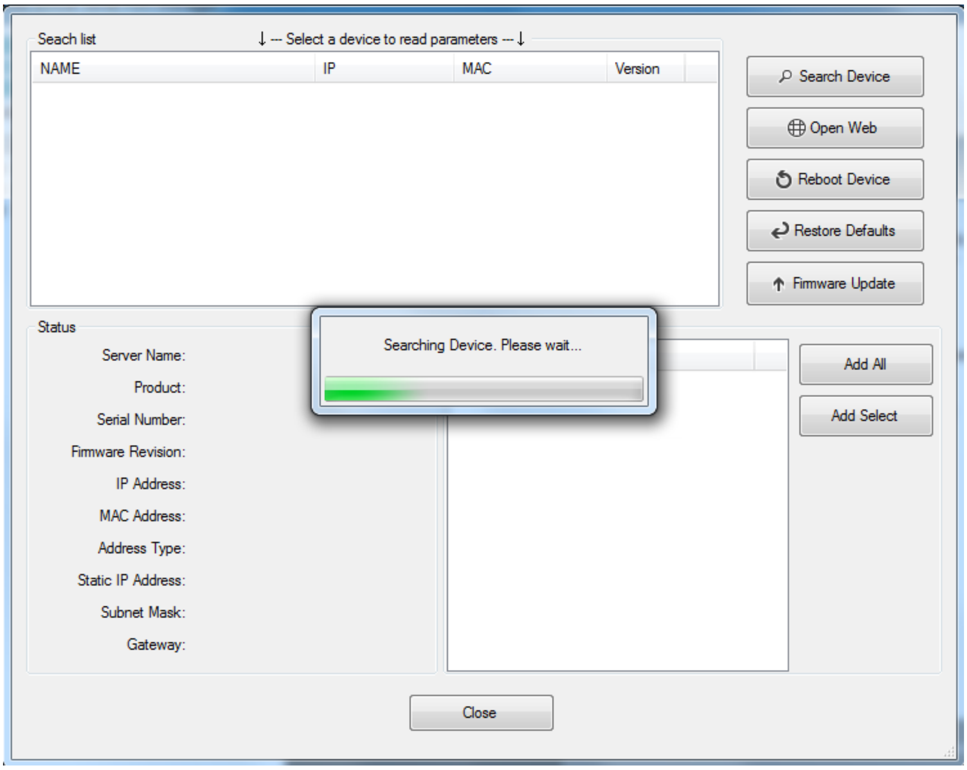
NCOM_410789456_COM2
COM2 Virtual Created
Connected to 0 from 1
Sent: 0.0 KB / Received: 0.0 KB

8.6 Automatically Search for NCAN CAN to Ethernet Gateway

NCOM Virtual Serial Port Manager provides a search function, which can search all attached NCAN CAN to Ethernet Gateway and can also automatically install virtual serial port driver for NCAN CAN to Ethernet Gateway. You may also open the web console interface to configure NCOM, reboot NCAN CAN to Ethernet Gateway, restore factory defaults and execute firmware update from here.

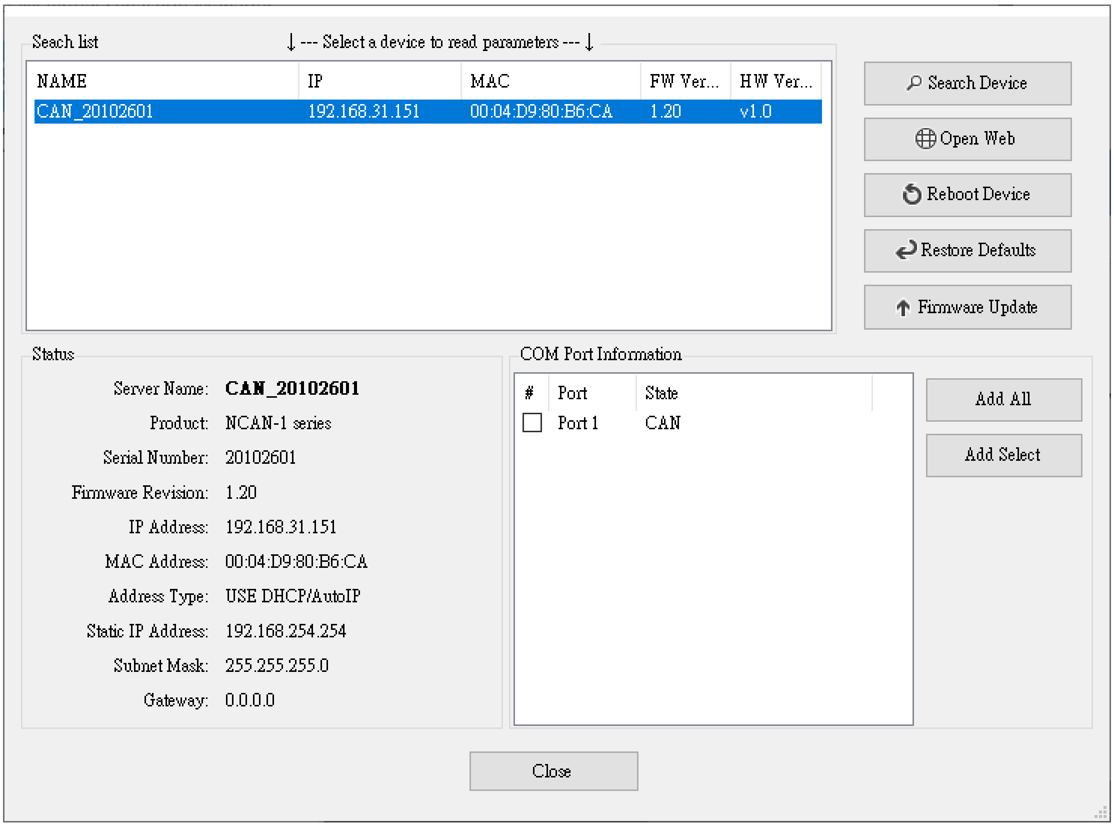
“**Search**” (search all attached NCAN CAN to Ethernet Gateway automatically).

Clicking on “Search Search ” takes you to the control menu page shown below:



Searching Device. Please wait...

After a few seconds, the NCOM Virtual Serial Port Manager will search and display all attached NCAN CAN to Ethernet Gateway automatically.



Seach list ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver...	HW Ver...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Status

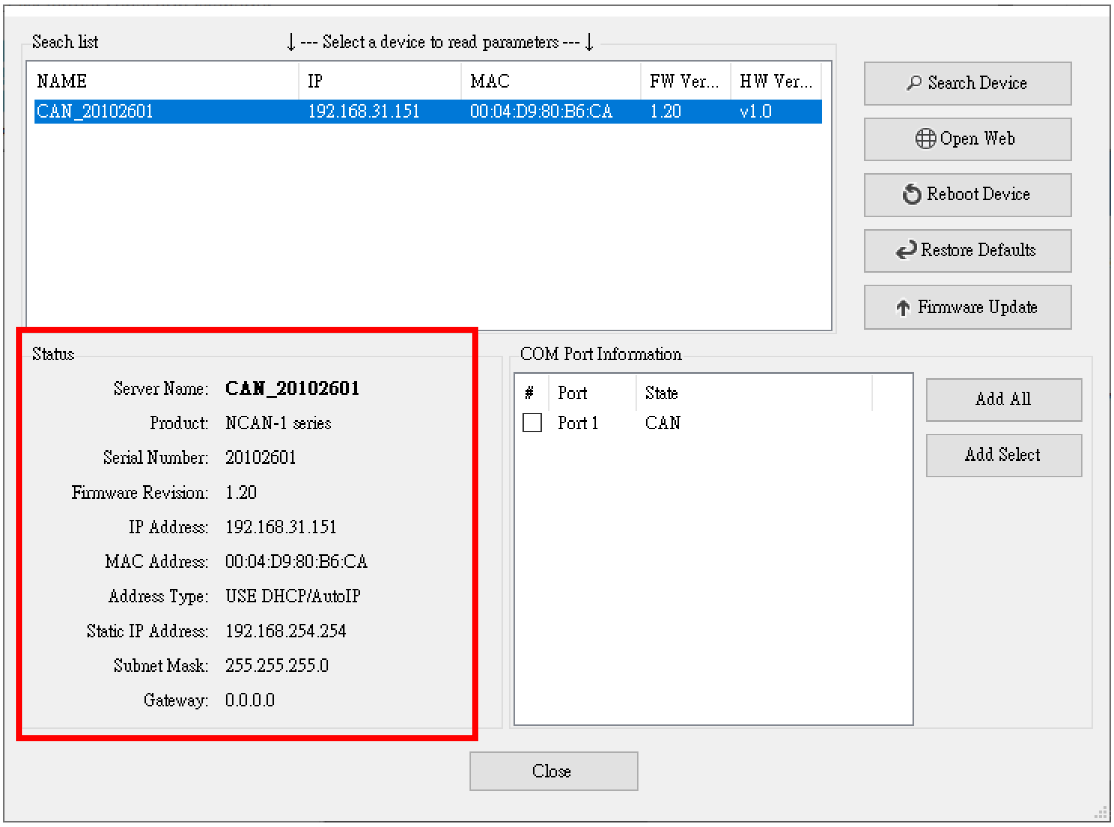
Server Name:	**CAN_20102601**
Product:	NCAN-1 series
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00:04:D9:80:B6:CA
Address Type:	USE DHCP/AutoIP
Static IP Address:	192.168.254.254
Subnet Mask:	255.255.255.0
Gateway:	0.0.0.0

COM Port Information

#	Port	State
□	Port 1	CAN

8.6.1 Selecting an NCOM Device to Read Parameters

After you select an attached NCOM device to configure the virtual serial port parameters, you will find the NCOM device information on the main window of NCOM Virtual Serial Port Manager. The information includes “Server Name”, “Product”, “Serial Number”, “Firmware Revision”, “IP Address”, “MAC Address”, “Address Type”, “Static IP Address”, “Subnet Mask” and “Gateway”.



Seach list ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver...	HW Ver...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Status

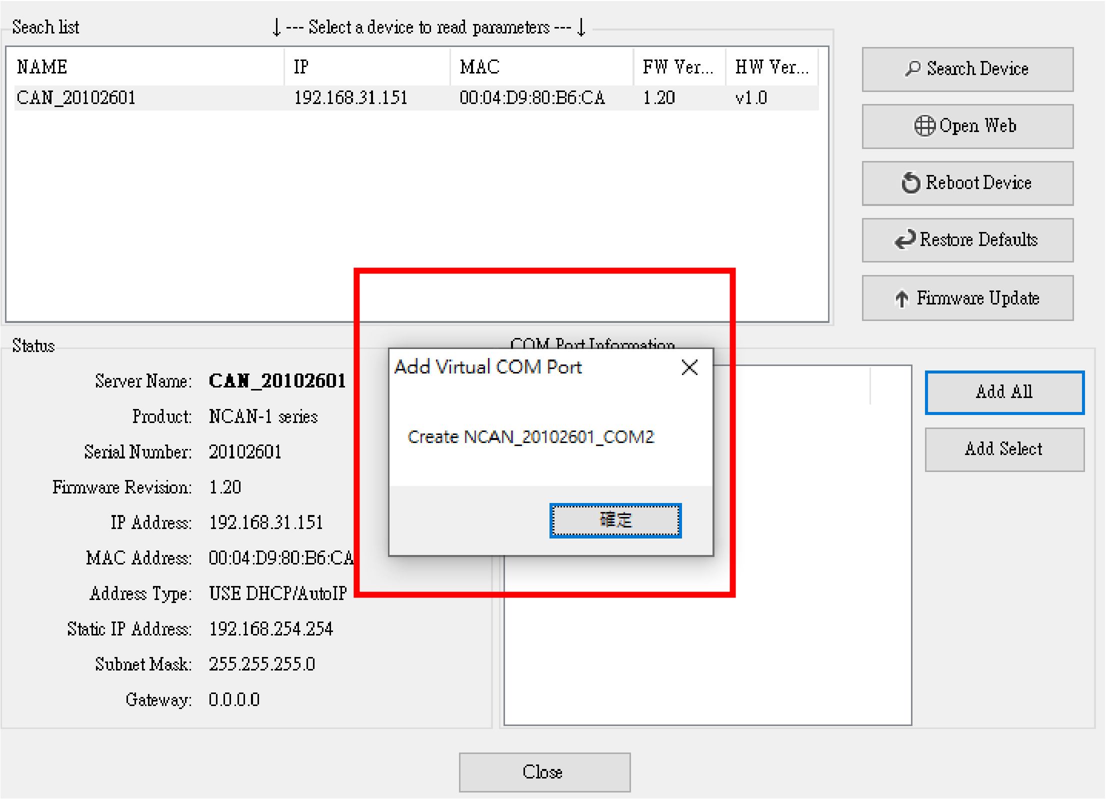
Server Name: **CAN_20102601**
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

COM Port Information

#	Port	State
□	Port 1	CAN

8.6.2 Installing Virtual Serial Port Driver for NCAN CAN to Ethernet Gateway

The search function can also create virtual COM ports and install virtual serial port drivers automatically. After selecting an attached NCAN CAN to Ethernet Gateway from the control menu, click “**Add All**” button to install virtual serial port drivers automatically. After installation you will find two “Create NCAN_XXXXXXXXX_COMX” messages and the virtual serial ports created for the attached NCOM device.



NAME	IP	MAC	FW Ver...	HW Ver...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

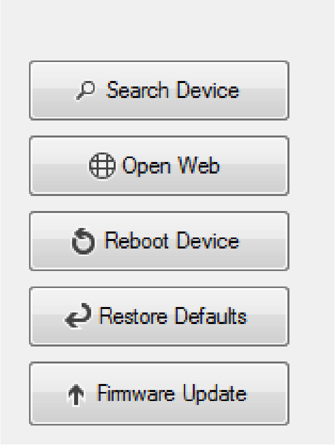
Server Name: **CAN_20102601**
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

Add Virtual COM Port

Create NCAN_20102601_COM2

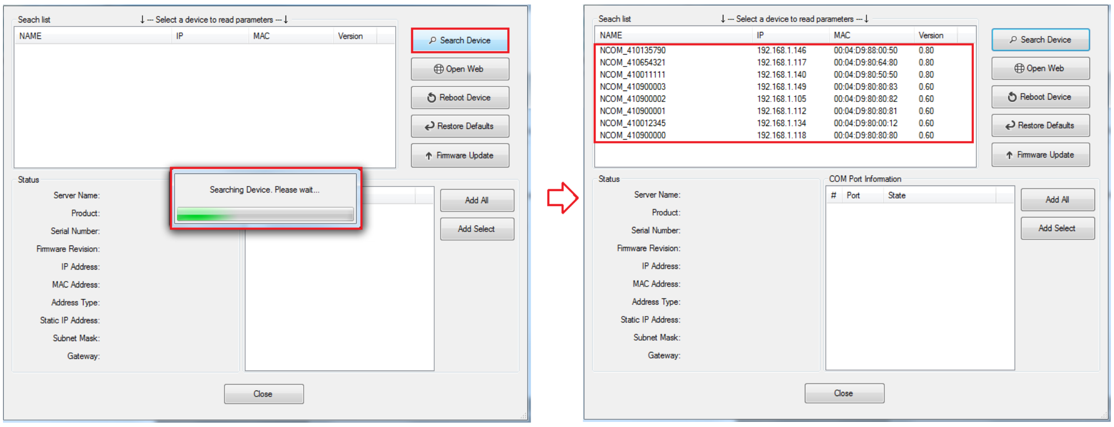
Click “OK” to finish creating virtual serial ports for your NCAN CAN to Ethernet Gateway.

In the “Search” window, there are five control buttons: “**Search Device**”, “**Open Web**”, “**Reboot Device**”, “**Restore Defaults**” and “**Firmware Update**”.



8.6.3 Manually Search for NCAN CAN to Ethernet Gateway

The “**Search Device**” button searches for all attached NCAN CAN to Ethernet Gateway. If a new NCAN CAN to Ethernet Gateway is attached to the network system, you can click “Search Device” to find new NCAN CAN to Ethernet Gateway.

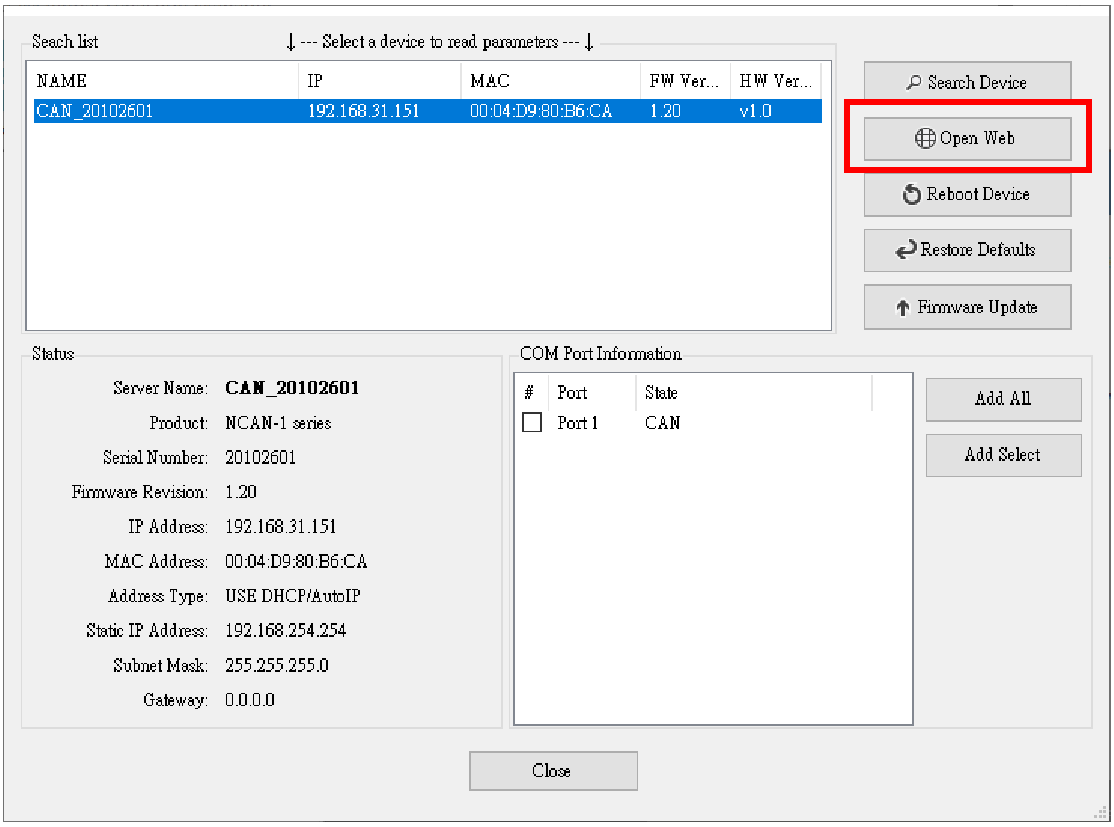


Searching Device. Please wait...

NAME	IP	MAC	Version
NCOM_410135790	192.168.1.146	00:04:D9:88:00:50	0.80
NCOM_410654321	192.168.1.117	00:04:D9:80:64:80	0.80
NCOM_410011111	192.168.1.140	00:04:D9:80:50:50	0.80
NCOM_410900003	192.168.1.149	00:04:D9:80:80:83	0.60
NCOM_410900002	192.168.1.105	00:04:D9:80:80:82	0.60
NCOM_410900001	192.168.1.112	00:04:D9:80:80:81	0.60
NCOM_410012345	192.168.1.134	00:04:D9:80:00:12	0.60
NCOM_410900000	192.168.1.118	00:04:D9:80:80:80	0.60

8.6.4 Opening the Web Console Interface

The “**Open Web**” button opens the web console interface to configure NCAN. After selecting an attached NCAN CAN to Ethernet Gateway, click “Open Web” to open the web console interface for that particular NCAN CAN to Ethernet Gateway.



Seach list ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver...	HW Ver...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Status

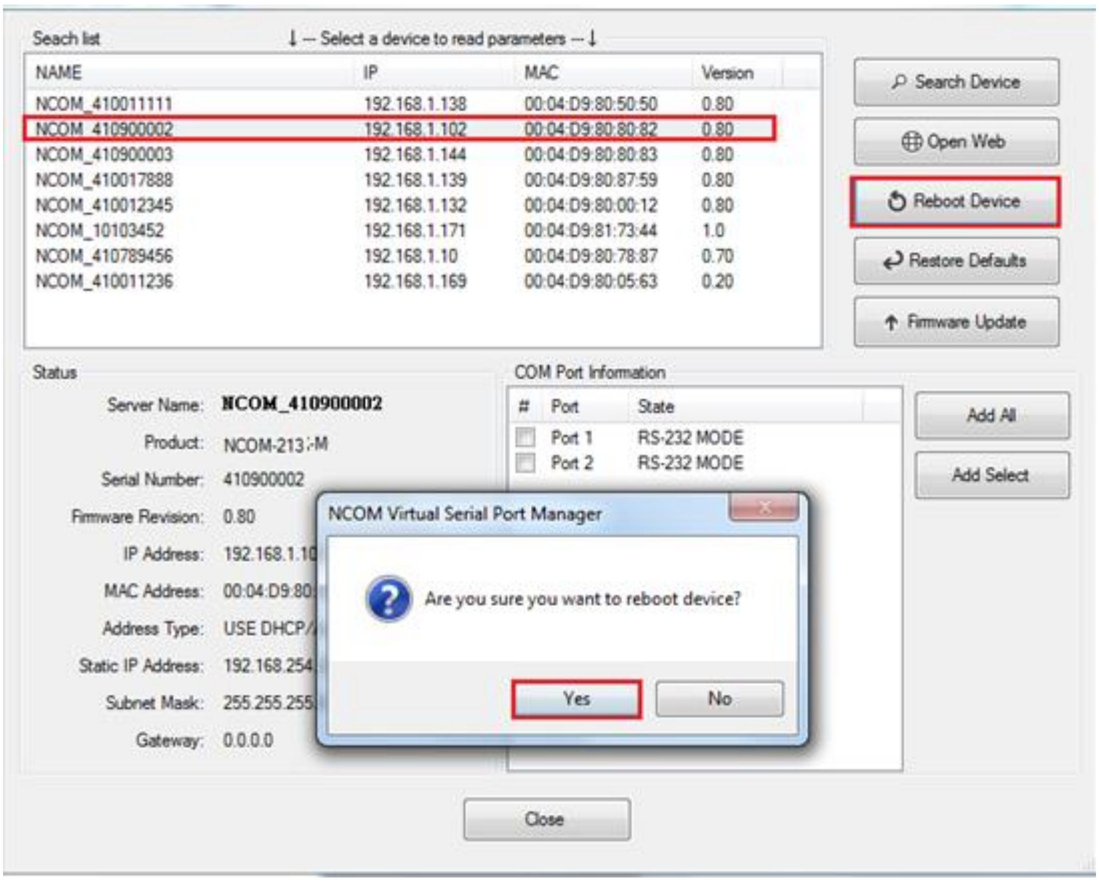
Server Name:	**CAN_20102601**
Product:	NCAN-1 series
Serial Number:	20102601
Firmware Revision:	1.20
IP Address:	192.168.31.151
MAC Address:	00:04:D9:80:B6:CA
Address Type:	USE DHCP/AutoIP
Static IP Address:	192.168.254.254
Subnet Mask:	255.255.255.0
Gateway:	0.0.0.0

COM Port Information

#	Port	State
□	Port 1	CAN

8.6.5 Rebooting NCAN CAN to Ethernet Gateway

The “**Reboot Device**” button reboots/resets your NCAN CAN to Ethernet Gateway. After selecting an attached NCAN CAN to Ethernet Gateway, click “Reboot Device” and a message will ask “Are you sure you want to reboot device?” Click “Yes” to reboot/reset your NCAN CAN to Ethernet Gateway.



Seach list ↓ -- Select a device to read parameters -- ↓

NAME	IP	MAC	Version
NCOM_410011111	192.168.1.138	00:04:D9:80:50:50	0.80
NCOM_410900002	192.168.1.102	00:04:D9:80:80:82	0.80
NCOM_410900003	192.168.1.144	00:04:D9:80:80:83	0.80
NCOM_410017888	192.168.1.139	00:04:D9:80:87:59	0.80
NCOM_410012345	192.168.1.132	00:04:D9:80:00:12	0.80
NCOM_10103452	192.168.1.171	00:04:D9:81:73:44	1.0
NCOM_410789456	192.168.1.10	00:04:D9:80:78:87	0.70
NCOM_410011236	192.168.1.169	00:04:D9:80:05:63	0.20

Status

Server Name: NCOM_410900002
Product: NCOM-213;-M
Serial Number: 410900002
Firmware Revision: 0.80
IP Address: 192.168.1.10
MAC Address: 00:04:D9:80
Address Type: USE DHCP/
Static IP Address: 192.168.254
Subnet Mask: 255.255.255
Gateway: 0.0.0.0

COM Port Information

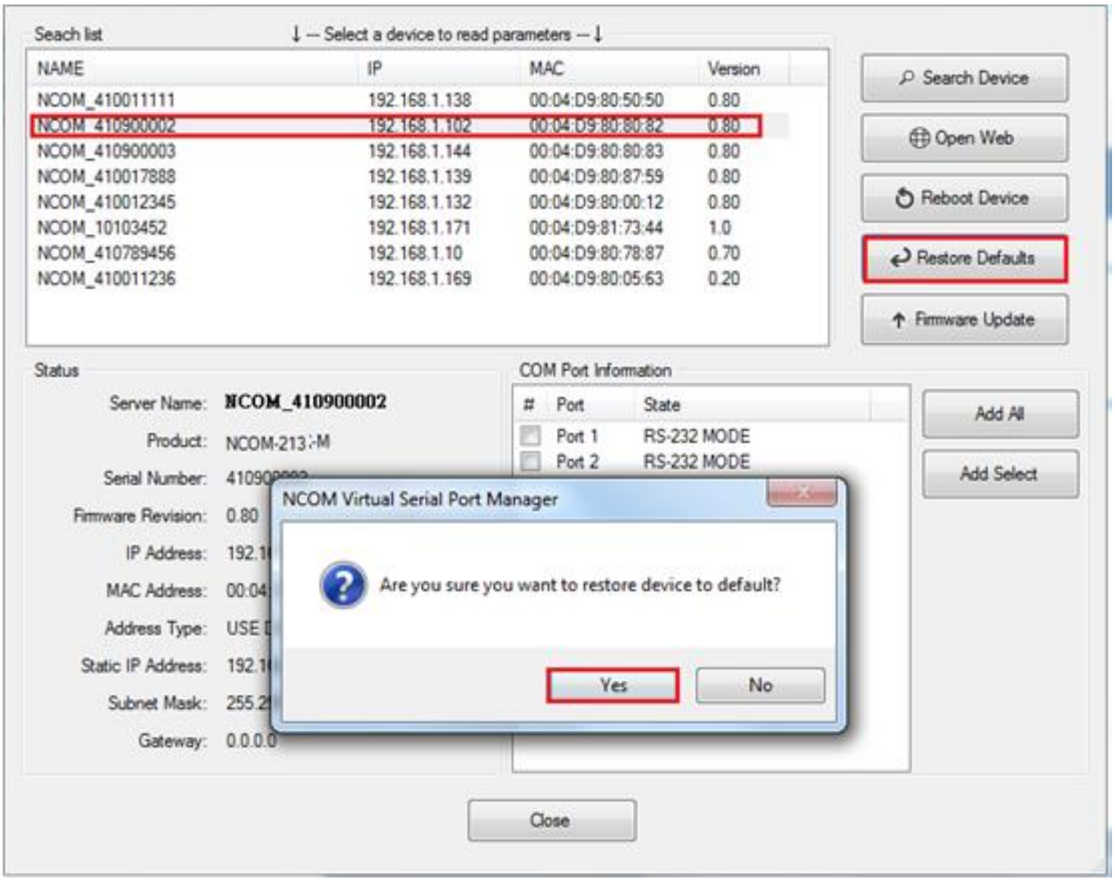
#	Port	State
□	Port 1	RS-232 MODE
□	Port 2	RS-232 MODE

NCOM Virtual Serial Port Manager

Are you sure you want to reboot device?

8.6.6 Restoring to Factory Defaults

The “**Restore Defaults**” button restores the firmware to factory defaults. When you select an attached NCAN CAN to Ethernet Gateway, you can restore all options to factory default states by clicking the “Restore Defaults” button; After clicking “Restore Defaults”, a message will ask “Are you sure you want to restore device to default?”. Confirm by clicking “Yes” and the NCAN CAN to Ethernet Gateway will restore all options to factory defaults.



Seach list ↓ -- Select a device to read parameters -- ↓

NAME	IP	MAC	Version
NCOM_410011111	192.168.1.138	00:04:D9:80:50:50	0.80
NCOM_410900002	192.168.1.102	00:04:D9:80:80:82	0.80
NCOM_410900003	192.168.1.144	00:04:D9:80:80:83	0.80
NCOM_410017888	192.168.1.139	00:04:D9:80:87:59	0.80
NCOM_410012345	192.168.1.132	00:04:D9:80:00:12	0.80
NCOM_10103452	192.168.1.171	00:04:D9:81:73:44	1.0
NCOM_410789456	192.168.1.10	00:04:D9:80:78:87	0.70
NCOM_410011236	192.168.1.169	00:04:D9:80:05:63	0.20

Status

Server Name: NCOM_410900002
Product: NCOM-213-M
Serial Number: 41090
Firmware Revision: 0.80
IP Address: 192.1
MAC Address: 00:04
Address Type: USE
Static IP Address: 192.1
Subnet Mask: 255.2
Gateway: 0.0.0.0

COM Port Information

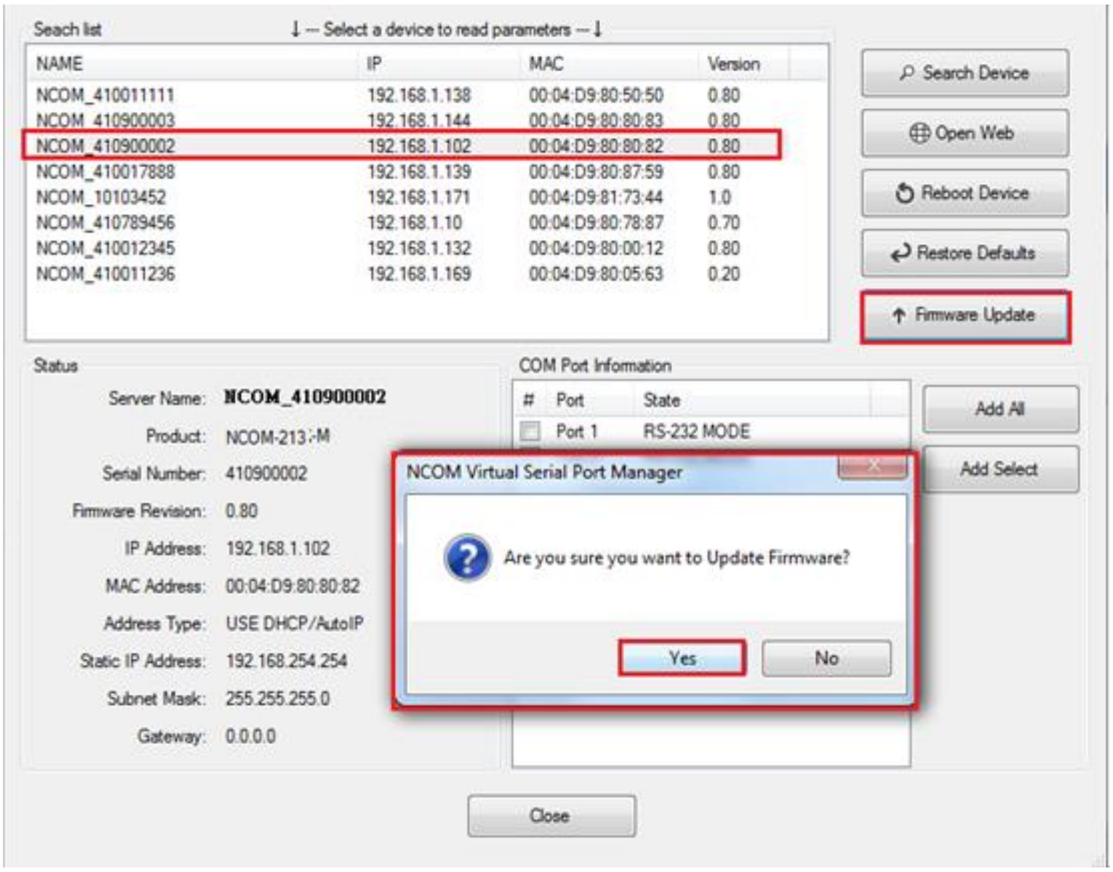
#	Port	State
□	Port 1	RS-232 MODE
□	Port 2	RS-232 MODE

NCOM Virtual Serial Port Manager

Are you sure you want to restore device to default?

8.6.7 Firmware Update Tool

The “**Firmware Update**” button opens the firmware update tool to upgrade NCAN-1 firmware contents via Ethernet port.



Seach list ↓ — Select a device to read parameters — ↓

NAME	IP	MAC	Version
NCOM_410011111	192.168.1.138	00:04:D9:80:50:50	0.80
NCOM_410900003	192.168.1.144	00:04:D9:80:80:83	0.80
NCOM_410900002	192.168.1.102	00:04:D9:80:80:82	0.80
NCOM_410017888	192.168.1.139	00:04:D9:80:87:59	0.80
NCOM_10103452	192.168.1.171	00:04:D9:81:73:44	1.0
NCOM_410789456	192.168.1.10	00:04:D9:80:78:87	0.70
NCOM_410012345	192.168.1.132	00:04:D9:80:00:12	0.80
NCOM_410011236	192.168.1.169	00:04:D9:80:05:63	0.20

Status

Server Name: NCOM_410900002
Product: NCOM-213-M
Serial Number: 410900002
Firmware Revision: 0.80
IP Address: 192.168.1.102
MAC Address: 00:04:D9:80:80:82
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

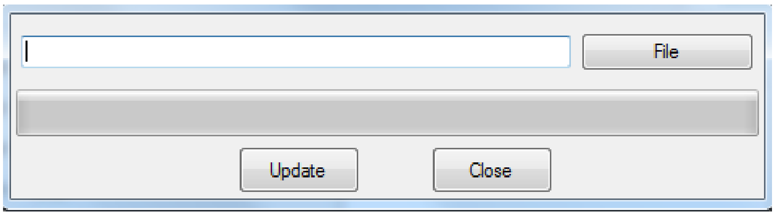
COM Port Information

#	Port	State
□	Port 1	RS-232 MODE

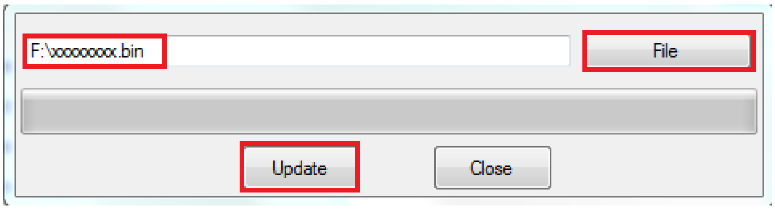
NCOM Virtual Serial Port Manager

Are you sure you want to Update Firmware?

When you click “Firmware Update”, a message will ask “Are you sure you want to update firmware?” Confirm by clicking “Yes” and the message “Input new firmware file” will appear.

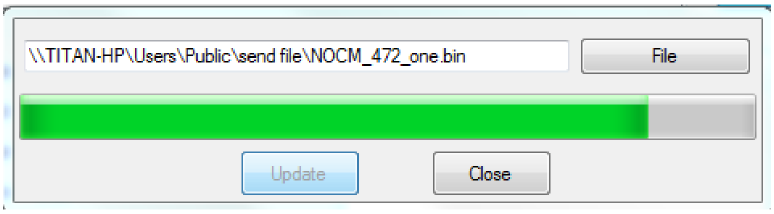


Use the “File” button to browse to the new firmware file and click on “Update” to start upgrading NCAN-1’s device firmware.



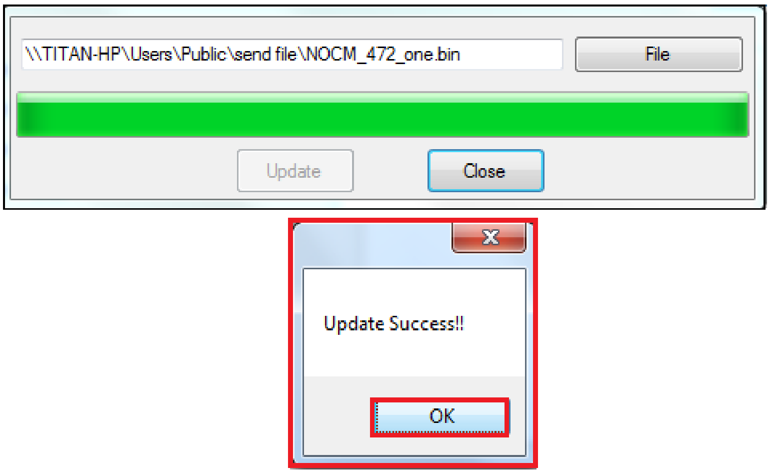
F:\xxxxxxxx.bin

While upgrading, you will find the following message.



\\TITAN-HP\Users\Public\send file\NOCM_472_one.bin

After successfully upgrading the firmware contents, there will be a message stating “Update Success!!”.



\\TITAN-HP\Users\Public\send file\NOCM_472_one.bin

Update Success!!

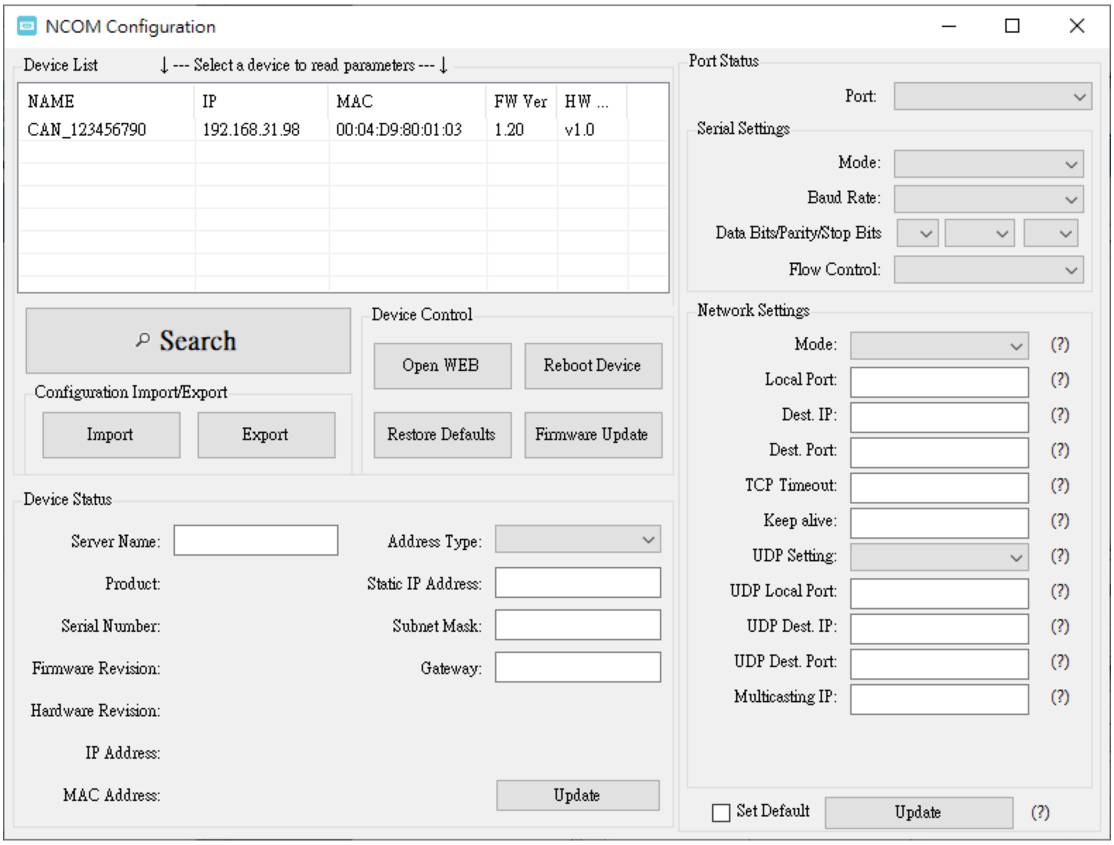
Click on “OK” to finish the firmware update procedure.

8.7 Configuring NCAN CAN to Ethernet Gateway

NCOM Virtual Serial Port Manager has a configuration function which can configure all attached NCAN CAN to Ethernet Gateway. It can also import/export configuration files for NCAN CAN to Ethernet Gateway, open web console interface to configure NCAN CAN to Ethernet Gateway, reboot NCAN CAN to Ethernet Gateway, restore factory defaults and execute firmware update.

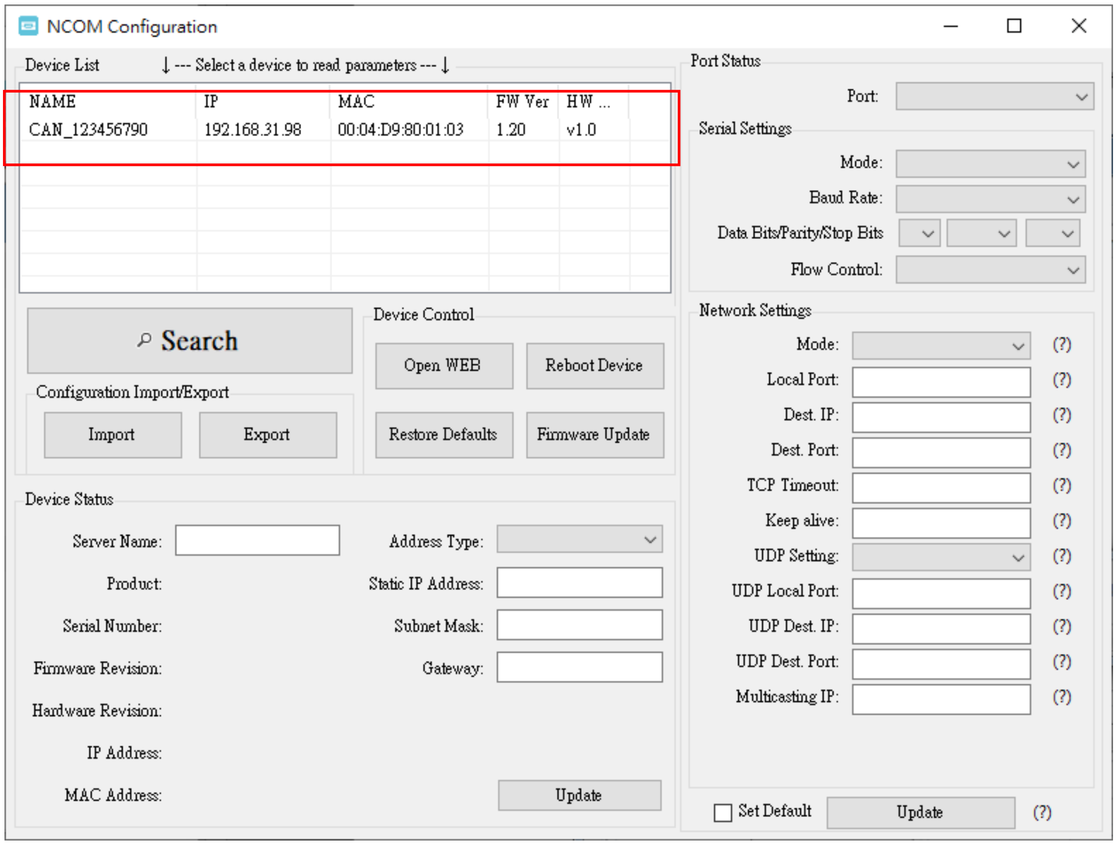
“**Configuration**” (configure all attached NCAN CAN to Ethernet Gateway).

Clicking on “Configuration Configuration ” takes you to the control menu page shown below:



NAME	IP	MAC	FW Ver	HW ...
CAN_123456790	192.168.31.98	00:04:D9:80:01:03	1.20	v1.0

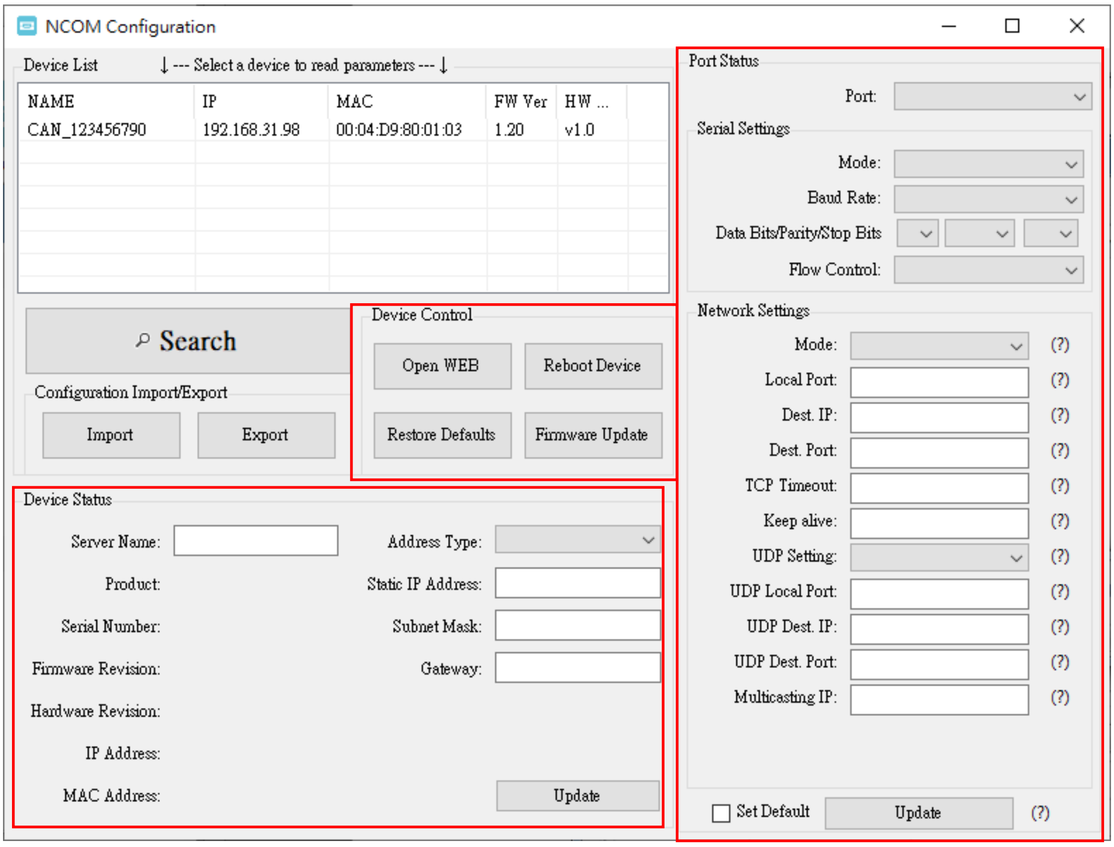
After a few seconds, NCOM Virtual Serial Port Manager will search all attached NCAN CAN to Ethernet Gateway automatically, and you will find “Device List” information for all NCAN CAN to Ethernet Gateway.



NAME	IP	MAC	FW Ver	HW ...
CAN_123456790	192.168.31.98	00:04:D9:80:01:03	1.20	v1.0

8.7.1 Selecting an NCAN CAN to Ethernet Gateway to Configure Parameters

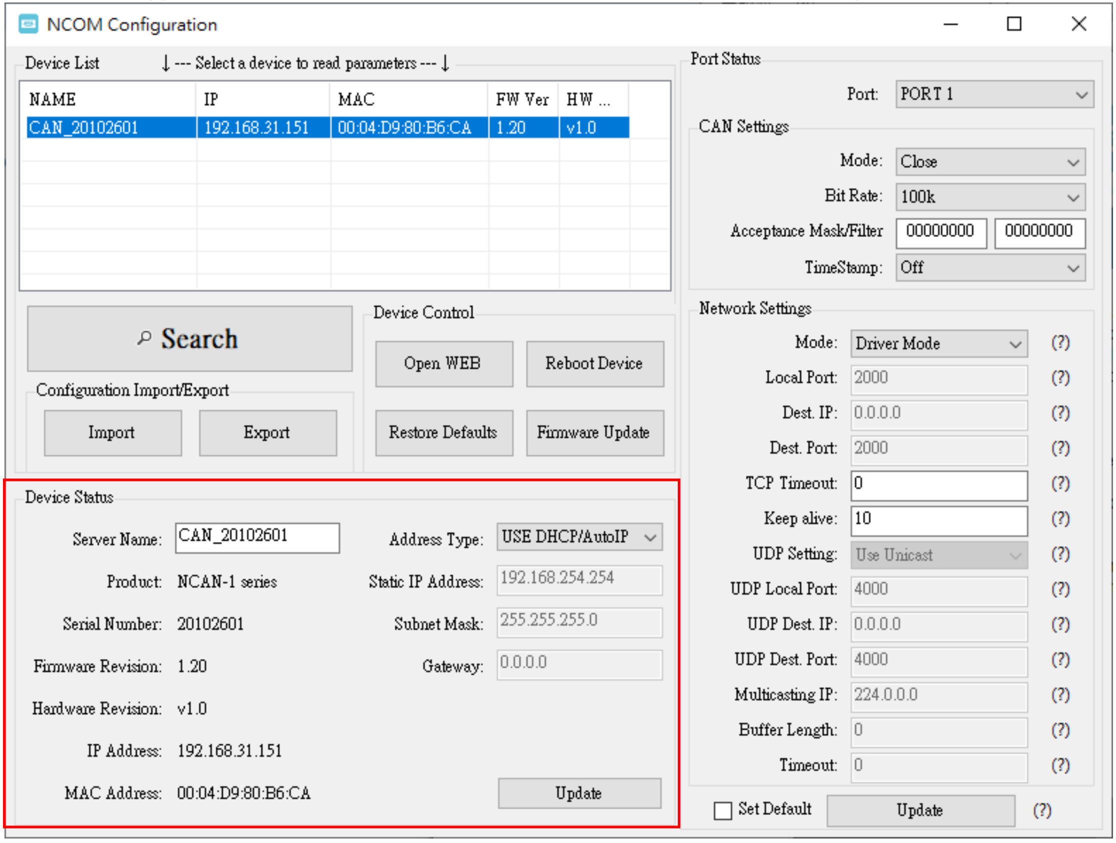
When you select an attached NCAN CAN to Ethernet Gateway to configure the virtual serial port parameters, you will find “Device Status”, “Port Status”, “Device Control” and “Configuration Import/Export” on the main window of NCOM Configuration.



NAME	IP	MAC	FW Ver	HW ...
CAN_123456790	192.168.31.98	00:04:D9:80:01:03	1.20	v1.0

8.7.2 Device Status

The “Device Status” section indicates the following information: “Server Name”, “Product”, “Serial Number”, “Firmware Revision”, “IP Address”, “MAC Address”, “Address Type”, “Static IP Address”, “Subnet Mask” and “Gateway”.



NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
Hardware Revision: v1.0
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

Port: PORT 1

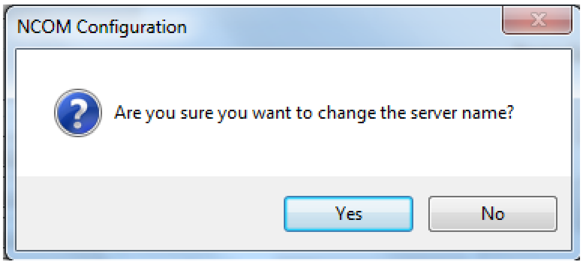
Mode: Close
Bit Rate: 100k
Acceptance Mask/Filter: 00000000 00000000
TimeStamp: Off

Mode: Driver Mode
Local Port: 2000
Dest. IP: 0.0.0.0
Dest. Port: 2000
TCP Timeout: 0
Keep alive: 10
UDP Setting: Use Unicast
UDP Local Port: 4000
UDP Dest. IP: 0.0.0.0
UDP Dest. Port: 4000
Multicasting IP: 224.0.0.0
Buffer Length: 0
Timeout: 0
□ Set Default

In “Device Status”, you can modify “Server Name”, “Address Type”, “Static IP Address”, “Subnet Mask” and “Gateway” depending on your application.

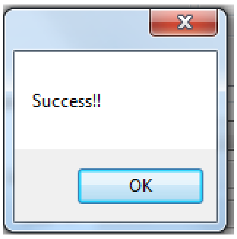
To change the CAN to Ethernet Gateway name, modify the “Server Name” under “Device Status”. You need to enter a new name (such as NCAN-1) and click “Update” to set your CAN to Ethernet Gateway to a new name.

After clicking “Update” a confirmation message will ask “Are you sure you want to change server name?” Confirm by clicking “Yes”.



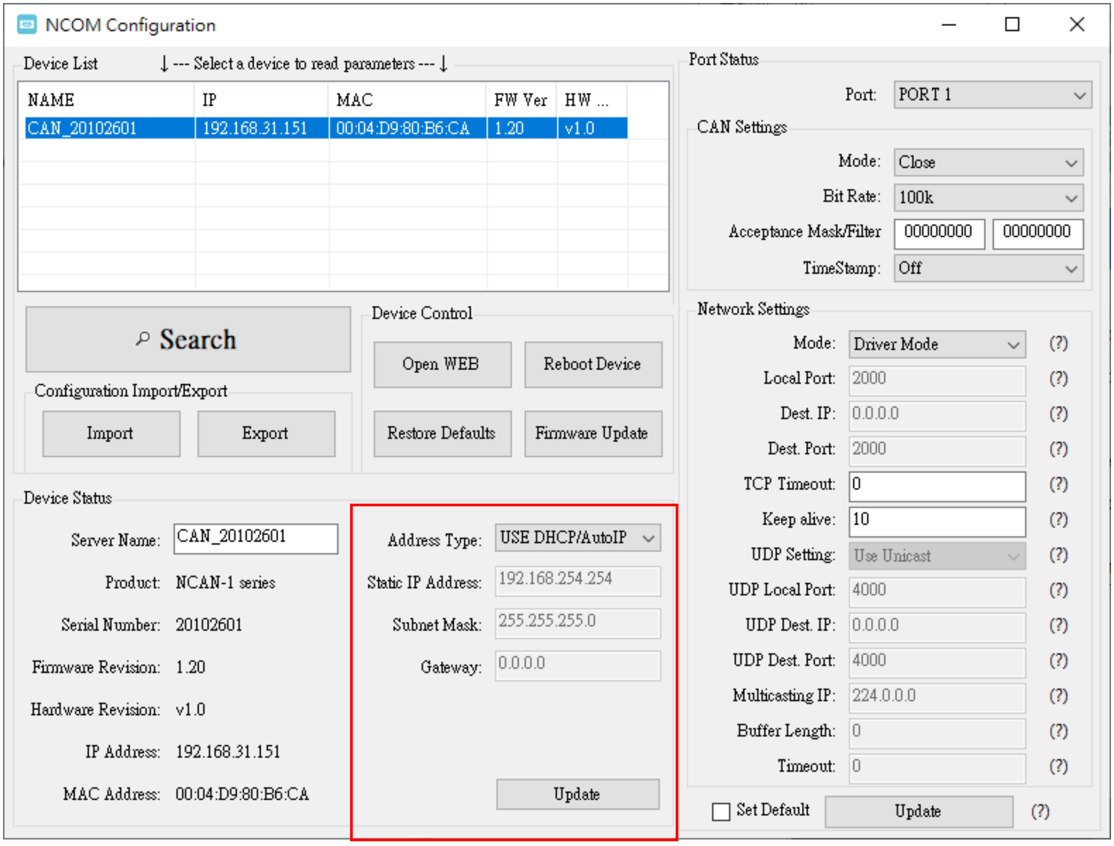
Are you sure you want to change the server name?

After NCAN-1 successfully changes to a new name, a message will indicate “Success!!”. Click on “OK” to finish the procedure.



Success!!

NCAN-1 CAN to Ethernet Gateway is configured with a default private IP address (static IP address): **192.168.254.254.**



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
Hardware Revision: v1.0
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close
Bit Rate: 100k
Acceptance Mask/Filter: 00000000 00000000
TimeStamp: Off

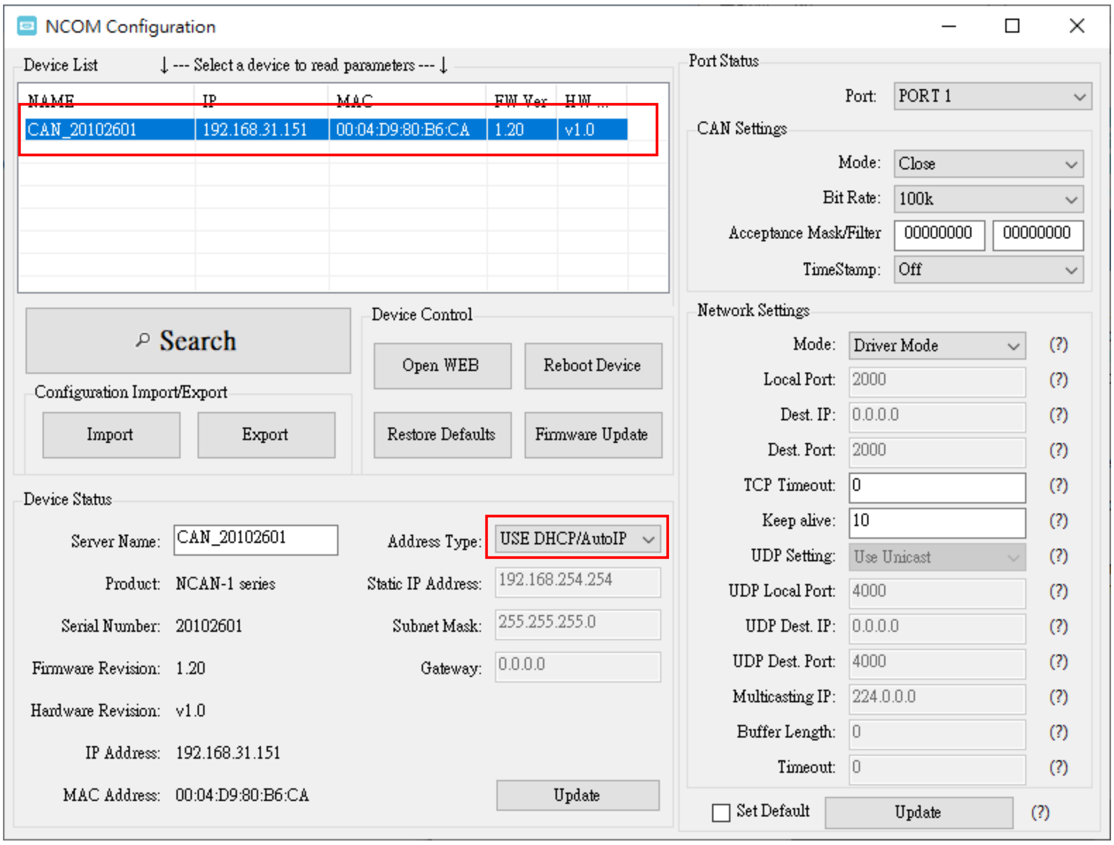
Network Settings

Mode: Driver Mode (?)
Local Port: 2000 (?)
Dest. IP: 0.0.0.0 (?)
Dest. Port: 2000 (?)
TCP Timeout: 0 (?)
Keep alive: 10 (?)
UDP Setting: Use Unicast (?)
UDP Local Port: 4000 (?)
UDP Dest. IP: 0.0.0.0 (?)
UDP Dest. Port: 4000 (?)
Multicasting IP: 224.0.0.0 (?)
Buffer Length: 0 (?)
Timeout: 0 (?)

□ Set Default

Many networks work in a DHCP network, which assigns IP addresses for client computers and NCAN-1 automatically. In this case, you need to set NCAN-1’s IP address to DHCP/AutoIP mode.

Under “Device Status” of NCOM Configuration, select “USE DHCP/AutoIP” under “Address Type:” and click “Update”. A message will ask “Are you sure you want to change Static IP to DHCP/AUTOIP?”, confirm by clicking “Yes” and NCAN-1 will be set to DHCP/AutoIP mode.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter: 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode

Local Port: 2000

Dest. IP: 0.0.0.0

Dest. Port: 2000

TCP Timeout: 0

Keep alive: 10

UDP Setting: Use Unicast

UDP Local Port: 4000

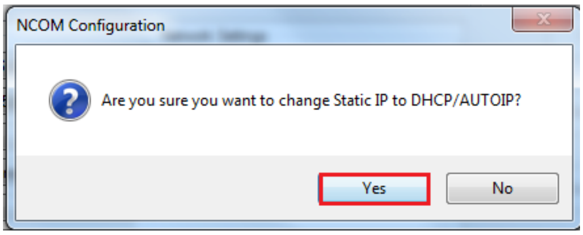
UDP Dest. IP: 0.0.0.0

UDP Dest. Port: 4000

Multicasting IP: 224.0.0.0

Buffer Length: 0

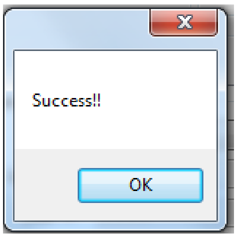
Timeout: 0



NCOM Configuration

Are you sure you want to change Static IP to DHCP/AUTOIP?

After successfully setting NCAN-1 to DHCP/AutoIP mode, a message will indicate "Success!!". Click on "OK" to finish changing the IP address type.



Success!!

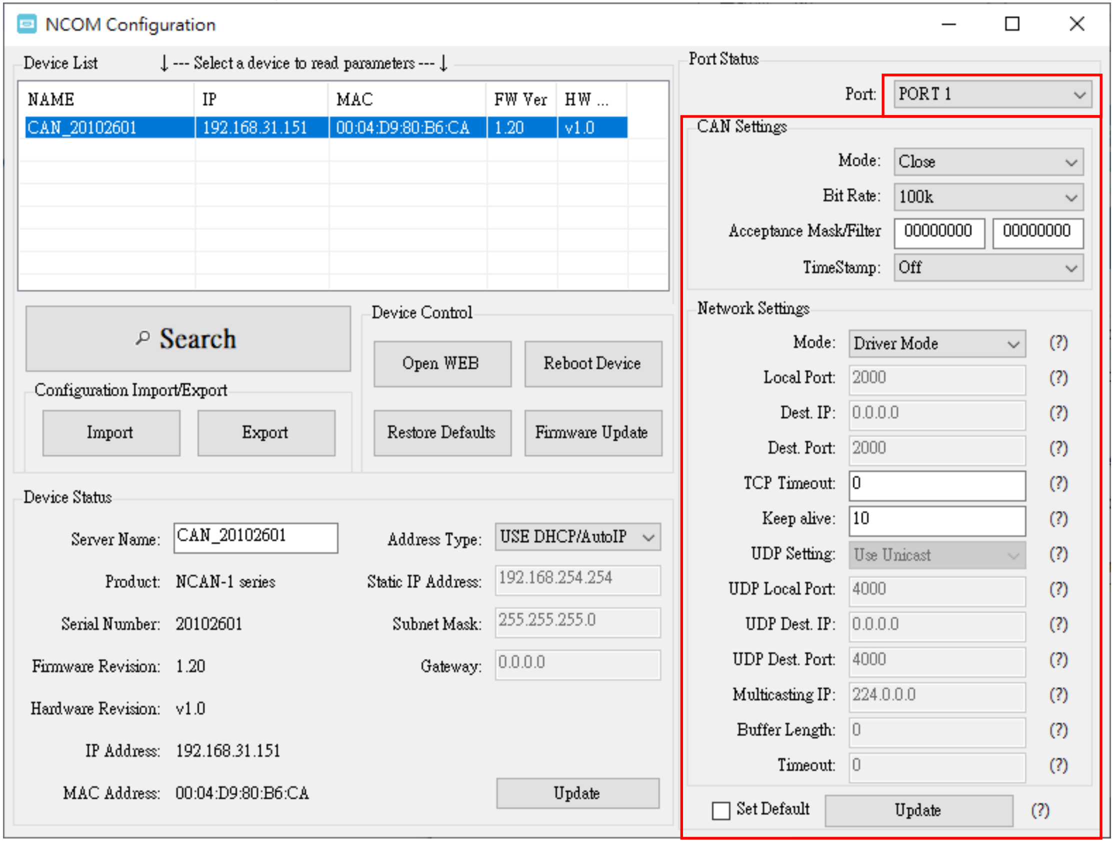
When NCAN-1 is working in a static network environment, you need to set NCAN-1 to a fixed IP address mode.

Under "Device Status" of NCOM Configuration, select "USE Static IP" under "Address Type:" and enter a new static IP address (such as 192.168.0.1), subnet mask (such as 255.255.255.0) and gateway (such as 0.0.0.0). Afterwards, click "Update" to set NCOM to a new static IP address for static network environments.

After clicking “Update”, a confirmation message saying “Are you sure you want to change new Static IP?” will appear. Confirm by clicking “Yes” and NCAN-1 will be set to a new static IP address.

8.7.3 COM Port Status

The “Port Status” section indicate the following information: “Port X”, “CAN Settings” and “Network Settings”.



NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode (?)

Local Port: 2000 (?)

Dest. IP: 0.0.0.0 (?)

Dest. Port: 2000 (?)

TCP Timeout: 0 (?)

Keep alive: 10 (?)

UDP Setting: Use Unicast (?)

UDP Local Port: 4000 (?)

UDP Dest. IP: 0.0.0.0 (?)

UDP Dest. Port: 4000 (?)

Multicasting IP: 224.0.0.0 (?)

Buffer Length: 0 (?)

Timeout: 0 (?)

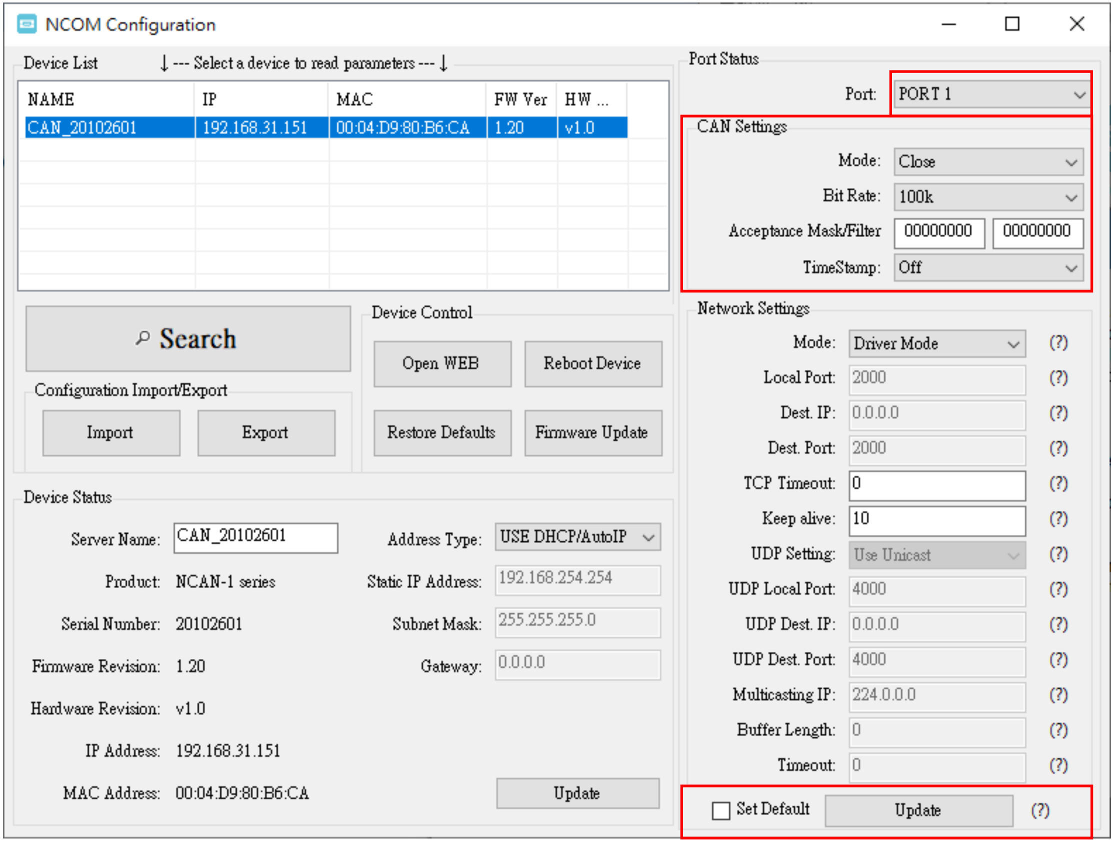
☐ Set Default

8.7.3.1 Changing CAN Parameters

To change serial parameters under “Serial Settings” for a virtual serial port, click “Port1/Port2” under “COM Port Status”. You can modify the following serial parameters:

CAN Parameter	Setting	Default Values
Mode	Close, Normal Mode, Listen Only, Loopback	Close
Bit Rate	10K to 1000K bit/s	100Kbit/s
Acceptance Mask	0x00000000~0x1FFFFFFF	0x00000000
Acceptance Filter	0x00000000~0x1FFFFFFF	0x00000000
TimeStamp	Off, On	Off

After changing the serial parameters, click “Update” to activate the new serial parameters. When the serial parameters are changed successfully, a message will indicate “Update Success!!”.



NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Server Name: CAN_20102601
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
Hardware Revision: v1.0
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

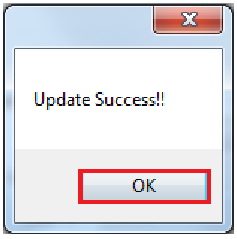
Port: PORT 1

Mode: Close
Bit Rate: 100k
Acceptance Mask/Filter 00000000 00000000
TimeStamp: Off

Mode: Driver Mode
Local Port: 2000
Dest. IP: 0.0.0.0
Dest. Port: 2000
TCP Timeout: 0
Keep alive: 10
UDP Setting: Use Unicast
UDP Local Port: 4000
UDP Dest. IP: 0.0.0.0
UDP Dest. Port: 4000
Multicasting IP: 224.0.0.0
Buffer Length: 0
Timeout: 0

Click on “OK” to finish changing the serial parameters.

If you want to save these CAN parameters as defaults, you need to check “Set Default” and click on “Update”. When the new serial parameters are saved, a message will indicate “Update Success!!”.

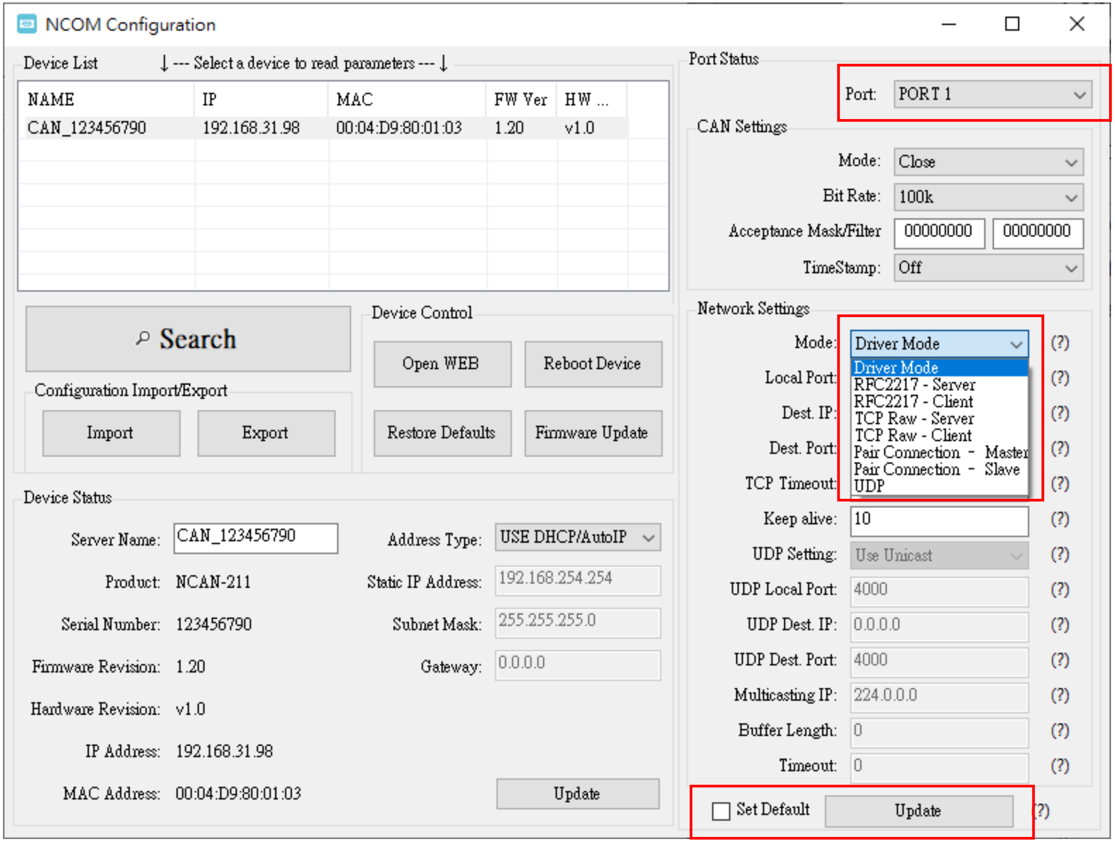

Update Success!!

Click on “OK” to finish modifying serial parameters and saving new serial parameters.

8.7.3.2 Changing Network Operation Mode

To change the network operation mode of a virtual serial port, click “Port 1” under “COM Port Status”. Under “Network Settings”, you may choose “Driver Mode”, “RFC2217 - Server”, “RFC2217 - Client”, “TCP Raw - Server”, “TCP Raw - Client”, “Pair Connection Master Mode”, “Pair Connection Slave Mode” and “UDP” depending on your application.

After selecting an operation mode, click “Update” to set your NCAN-1 into the proper operation mode.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_123456790	192.168.31.98	00:04:D9:80:01:03	1.20	v1.0

Device Status

Server Name: CAN_123456790

Product: NCAN-211

Serial Number: 123456790

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.98

MAC Address: 00:04:D9:80:01:03

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode

Keep alive: 10

UDP Setting: Use Unicast

UDP Local Port: 4000

UDP Dest. IP: 0.0.0.0

UDP Dest. Port: 4000

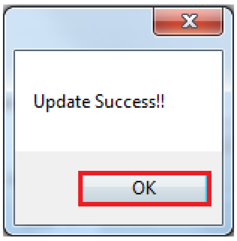
Multicasting IP: 224.0.0.0

Buffer Length: 0

Timeout: 0

□ Set Default

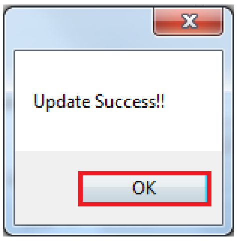
After clicking “Update” to set your NCAN-1’s operation mode, a message will indicate “Update Success!!”.



Update Success!!

Click on “OK” to finish change operation mode procedure.

If you want to save the new operation mode as defaults, you need to check on “Set Default” and click on “Update”. When the new operation mode is saved, a message will indicate “Update Success!!”.



Update Success!!

Click on “OK” to finish changing and saving a new operation mode.

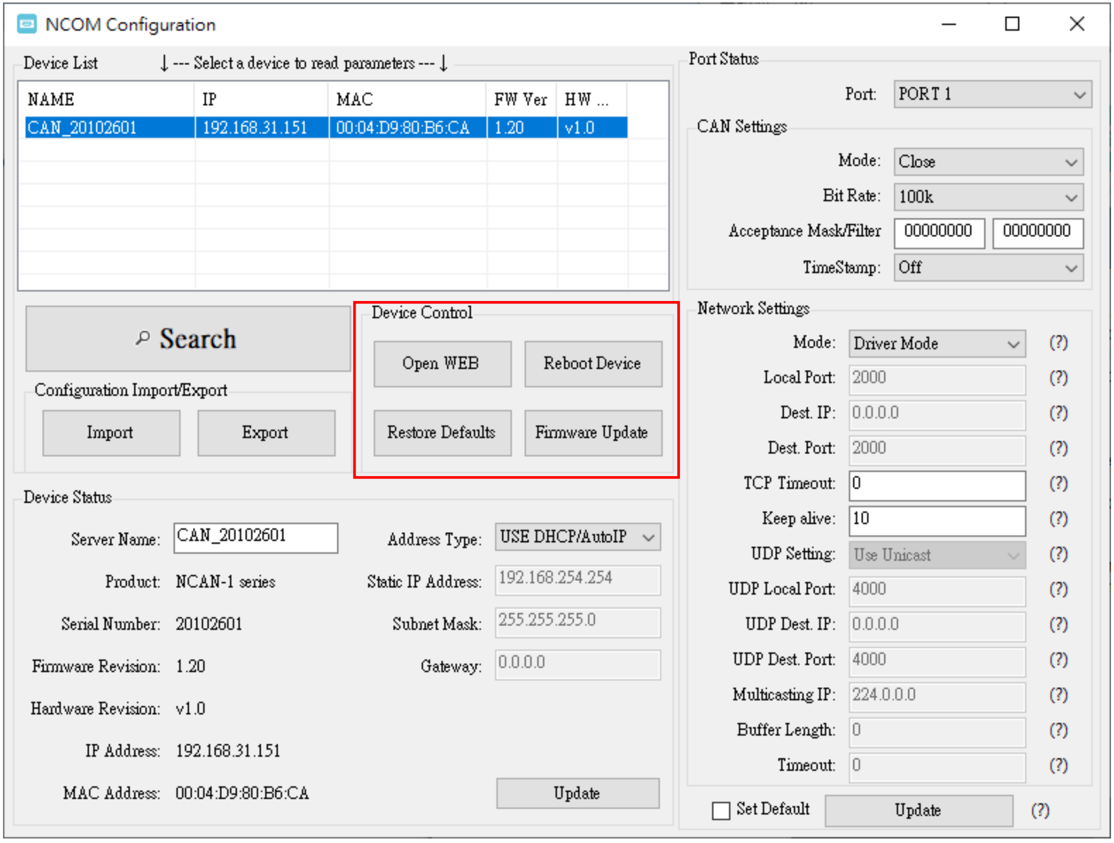
To modify the network settings for a chosen operation mode, please refer to Chapter 5 for detailed information. You can also modify the network parameter settings for your NCAN-1 CAN to Ethernet Gateway.

Following are the default values of network parameters:

Network Parameters	Default Values
Mode	Driver Mode
Timeout	0 seconds
Keep alive time	10 minutes
Address Type	Static IP
Static IP address	192.168.254.254
Subnet Mask	255.255.255.0

8.7.4 Device Control

The “Device Control” section contains the “Search Device”, “Open Web”, “Reboot Device”, “Restore Defaults” and “Firmware Update” functions.



NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter: 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode

Local Port: 2000

Dest. IP: 0.0.0.0

Dest. Port: 2000

TCP Timeout: 0

Keep alive: 10

UDP Setting: Use Unicast

UDP Local Port: 4000

UDP Dest. IP: 0.0.0.0

UDP Dest. Port: 4000

Multicasting IP: 224.0.0.0

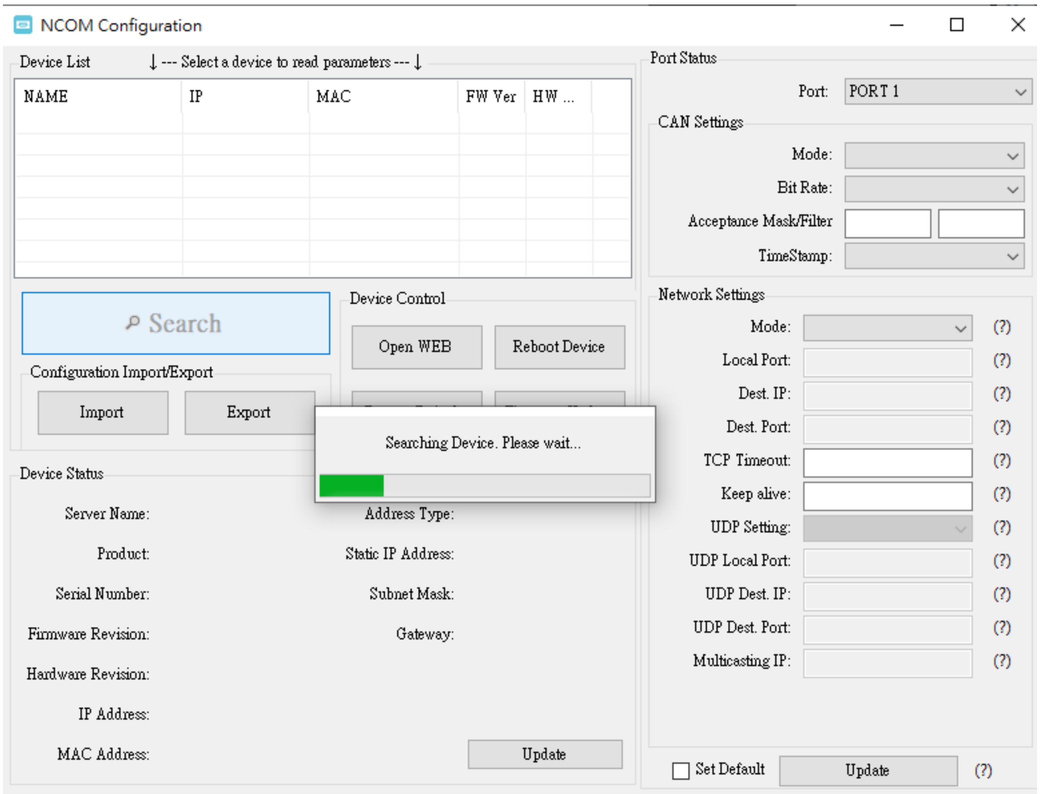
Buffer Length: 0

Timeout: 0

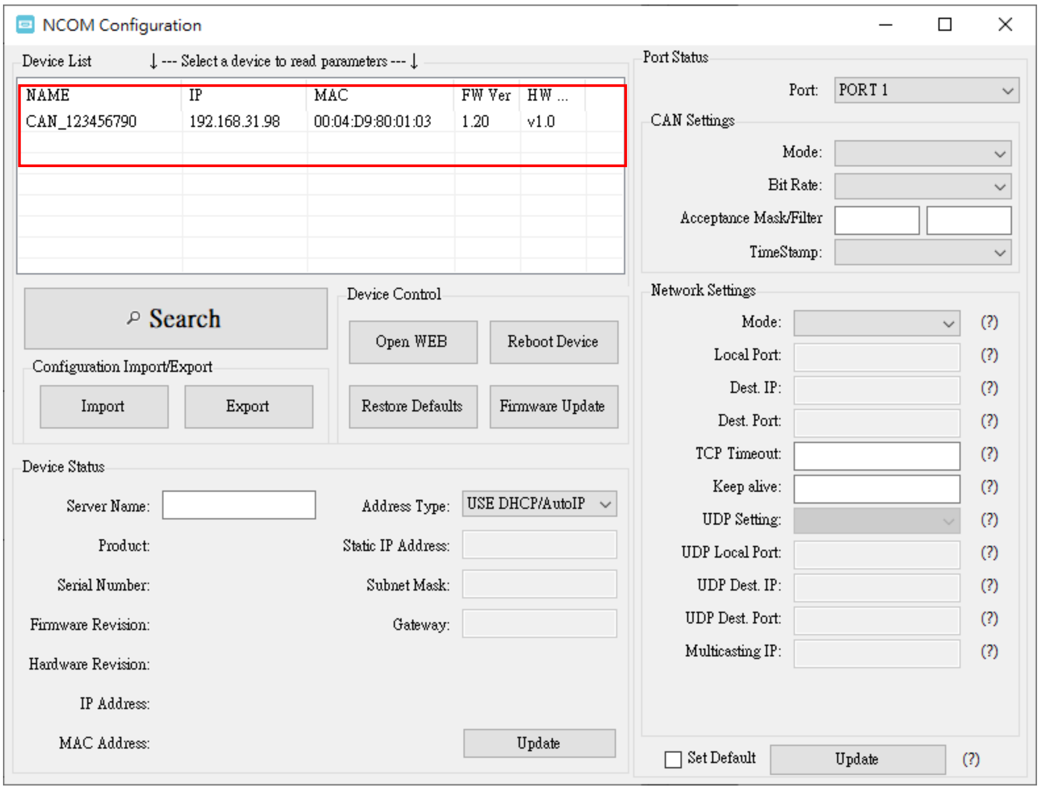
☐ Set Default

8.7.4.1 Manually Search for NCAN CAN to Ethernet Gateway

The “Search” button searches for all attached NCAN CAN to Ethernet Gateway. If a new NCOM device is attached to the network system, you can click “Search Device” to find new NCAN CAN to Ethernet Gateway.



Searching Device. Please wait...



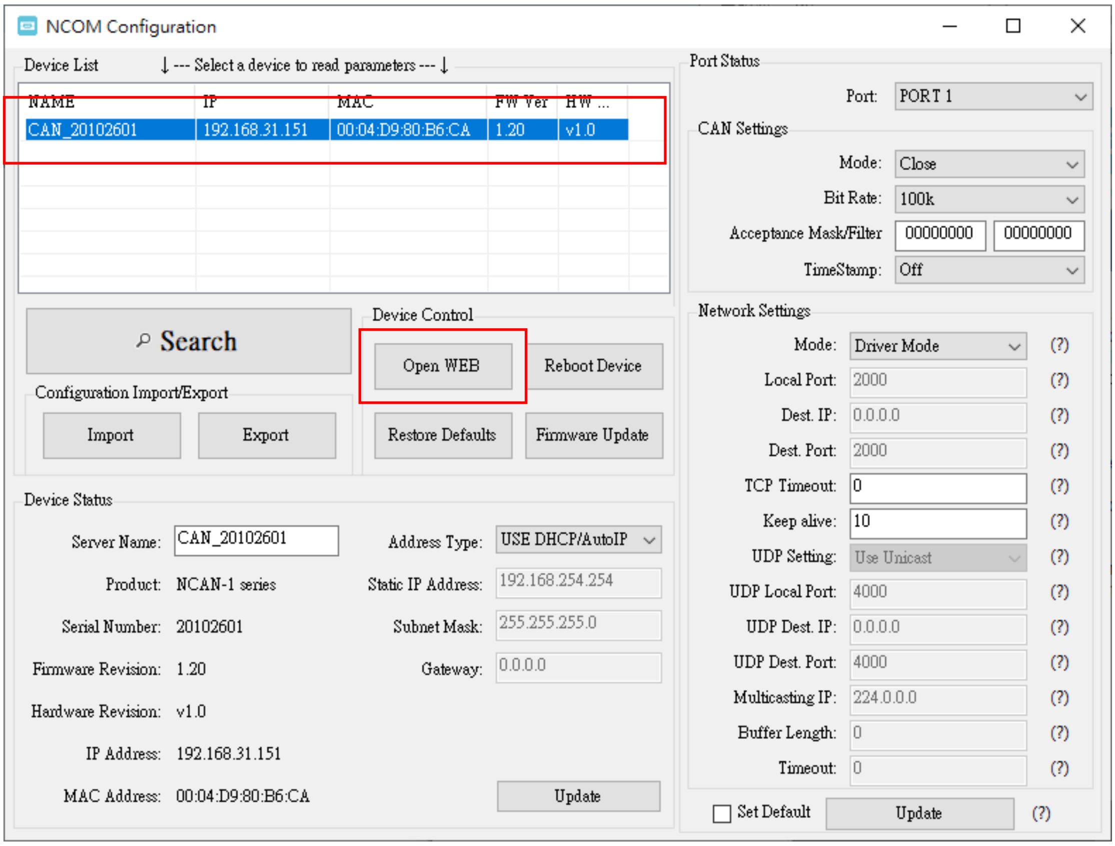
NAME	IP	MAC	FW Ver	HW ...
CAN_123456790	192.168.31.98	00:04:D9:80:01:03	1.20	v1.0

Address Type: USE DHCP/AutoIP

Port: PORT 1

8.7.4.2 *Opening the Web Console Interface*

The "Open Web" button can be used to open the web console interface to configure NCOM. After selecting an attached NCOM device, click "Open Web" to open web console interface for that particular NCOM device.



Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Control

Configuration Import/Export

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode

Local Port: 2000

Dest. IP: 0.0.0.0

Dest. Port: 2000

TCP Timeout: 0

Keep alive: 10

UDP Setting: Use Unicast

UDP Local Port: 4000

UDP Dest. IP: 0.0.0.0

UDP Dest. Port: 4000

Multicasting IP: 224.0.0.0

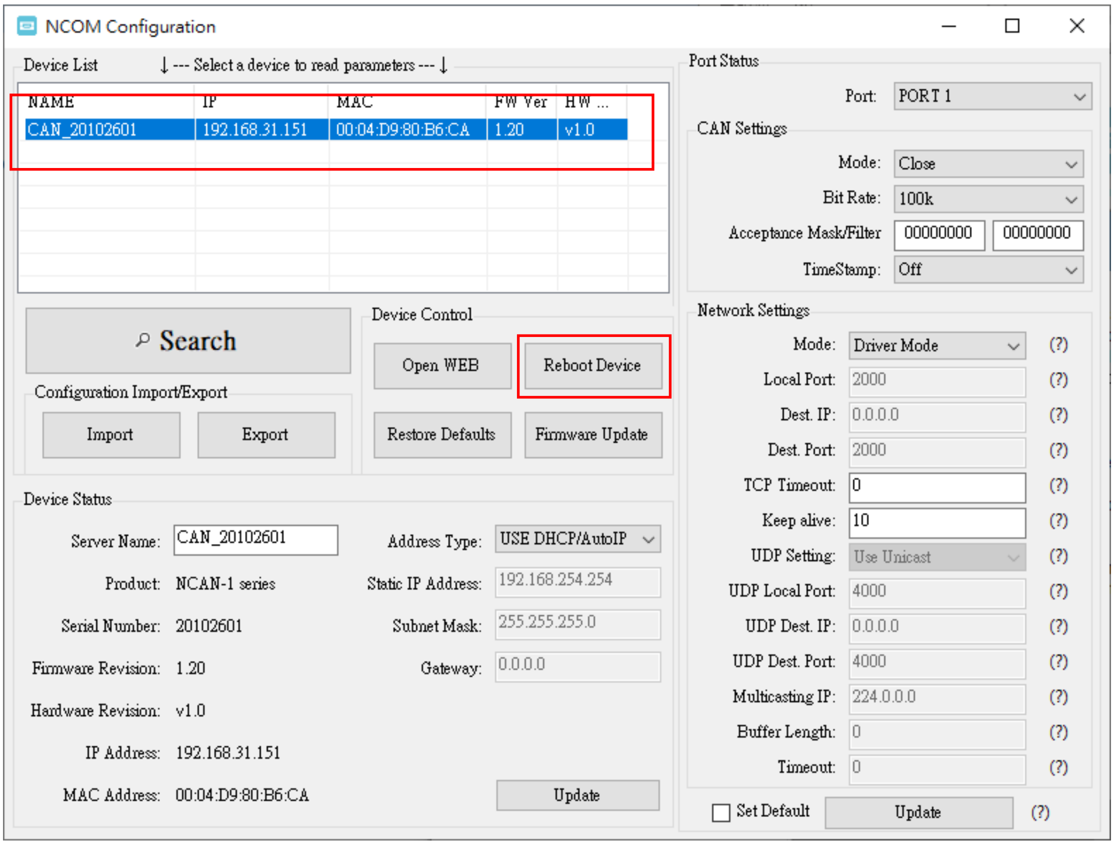
Buffer Length: 0

Timeout: 0

□ Set Default

8.7.4.3 Rebooting NCAN CAN to Ethernet Gateway

The “Reboot Device” button reboots/resets your NCOM device when you need to. After selecting an attached NCOM device, click “Reboot Device” and a message will ask “Are you sure you want to reboot device?”. Click “Yes” to reboot/reset your NCOM device.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode (?)

Local Port: 2000 (?)

Dest. IP: 0.0.0.0 (?)

Dest. Port: 2000 (?)

TCP Timeout: 0 (?)

Keep alive: 10 (?)

UDP Setting: Use Unicast (?)

UDP Local Port: 4000 (?)

UDP Dest. IP: 0.0.0.0 (?)

UDP Dest. Port: 4000 (?)

Multicasting IP: 224.0.0.0 (?)

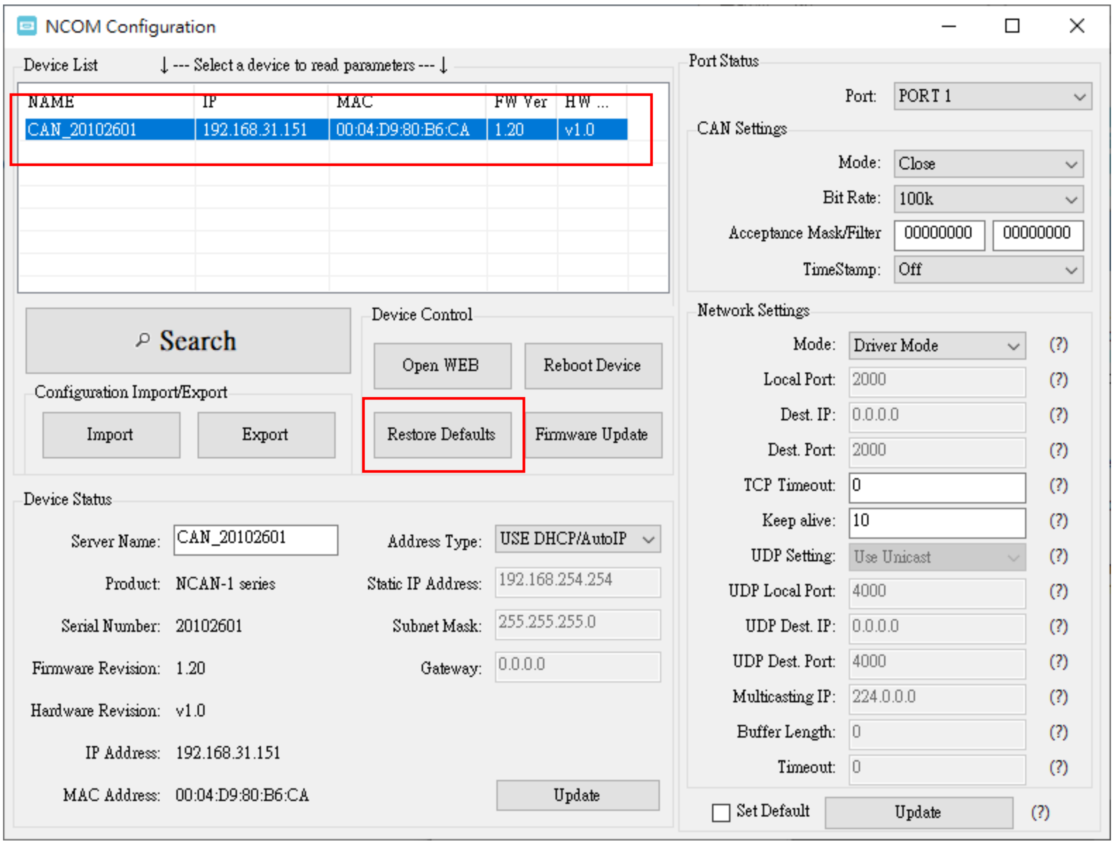
Buffer Length: 0 (?)

Timeout: 0 (?)

□ Set Default

8.7.4.4 Restoring to Factory Defaults

The “Restore Defaults” button restores the firmware to factory defaults. When you select an attached NCOM device, you can restore all options to factory default states by clicking the “Restore Defaults” button; After clicking “Restore Defaults”, a message will ask “Are you sure you want to restore device to default?”. Confirm by clicking “Yes” and the NCOM device will restore all options to factory defaults.


NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode (?)

Local Port: 2000 (?)

Dest. IP: 0.0.0.0 (?)

Dest. Port: 2000 (?)

TCP Timeout: 0 (?)

Keep alive: 10 (?)

UDP Setting: Use Unicast (?)

UDP Local Port: 4000 (?)

UDP Dest. IP: 0.0.0.0 (?)

UDP Dest. Port: 4000 (?)

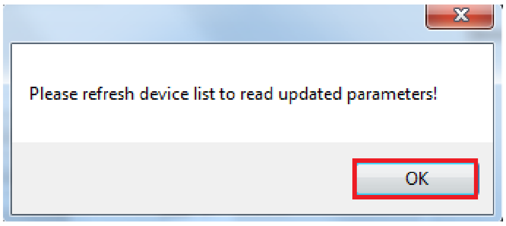
Multicasting IP: 224.0.0.0 (?)

Buffer Length: 0 (?)

Timeout: 0 (?)

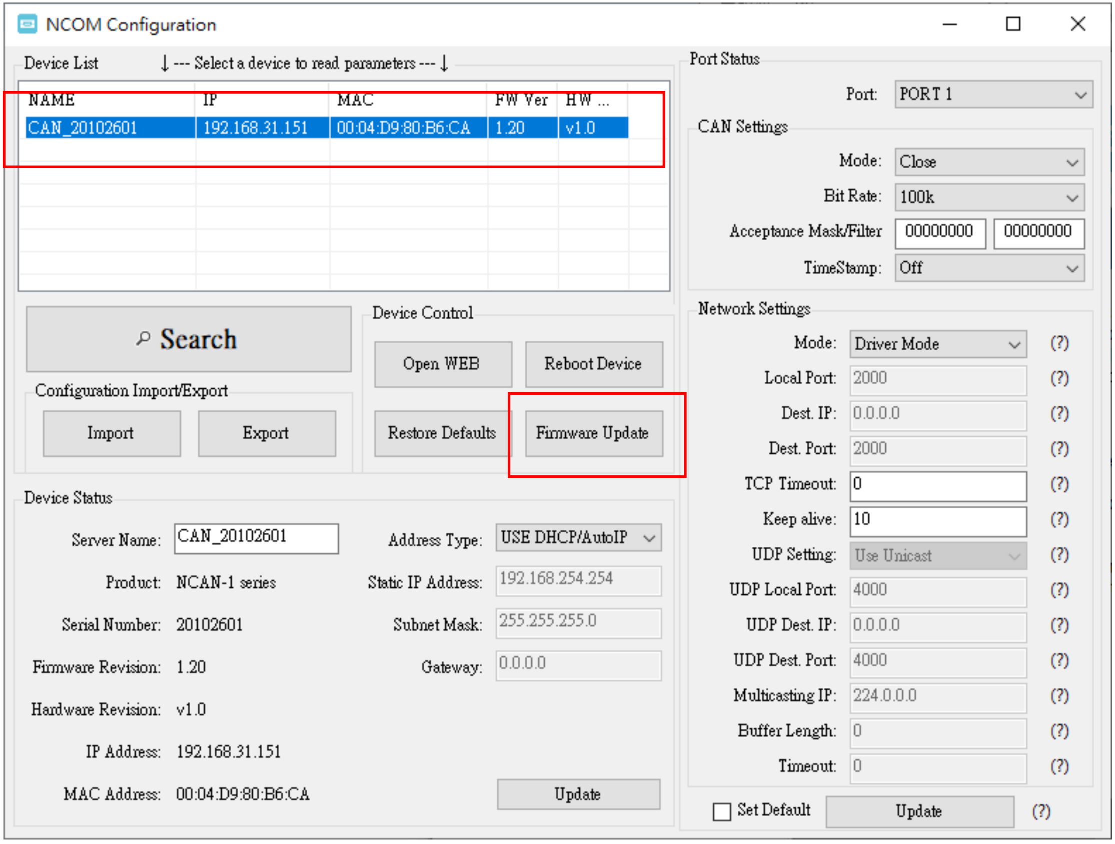
□ Set Default

After the NCOM device restores all options to factory default states, a message will indicate “Please refresh device list to read updated parameters!”. Click on “OK” to finish restoring device to factory defaults.


Please refresh device list to read updated parameters!

8.7.4.5 Firmware Update Tool

The “Firmware Update” button opens the firmware update tool to upgrade NCAN-1 firmware contents via Ethernet port. Before you click “Firmware Update”, please go to the web console interface of NCAN device firmware. Enable firmware update interface via Ethernet port to upgrade NCAN-1.


NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
Hardware Revision: v1.0
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

Port Status

Port: PORT 1

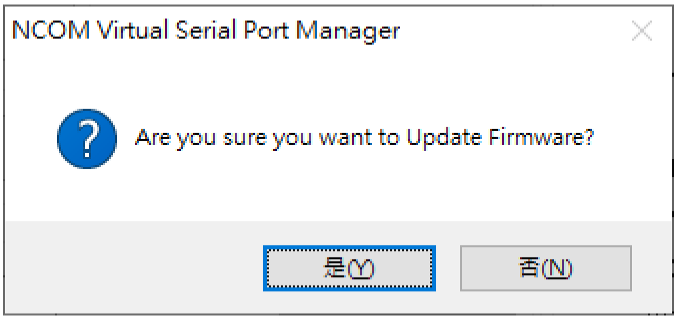
CAN Settings

Mode: Close
Bit Rate: 100k
Acceptance Mask/Filter: 00000000 00000000
TimeStamp: Off

Network Settings

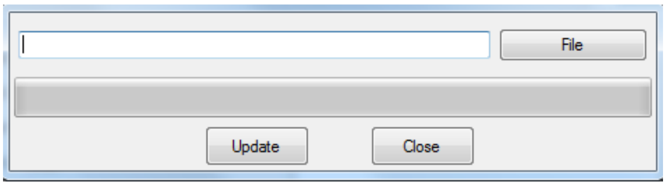
Mode: Driver Mode (?)
Local Port: 2000 (?)
Dest. IP: 0.0.0.0 (?)
Dest. Port: 2000 (?)
TCP Timeout: 0 (?)
Keep alive: 10 (?)
UDP Setting: Use Unicast (?)
UDP Local Port: 4000 (?)
UDP Dest. IP: 0.0.0.0 (?)
UDP Dest. Port: 4000 (?)
Multicasting IP: 224.0.0.0 (?)
Buffer Length: 0 (?)
Timeout: 0 (?)

☐ Set Default

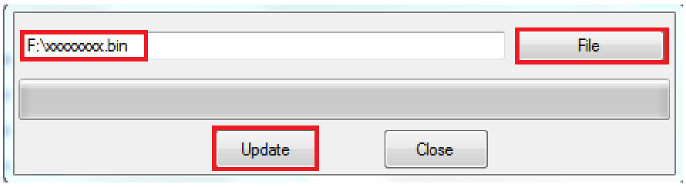

NCOM Virtual Serial Port Manager

Are you sure you want to Update Firmware?

When you click “Firmware Update”, a message will ask “Are you sure you want to update firmware?”. Confirm by clicking “Yes” and the message “Input new firmware file” will appear.

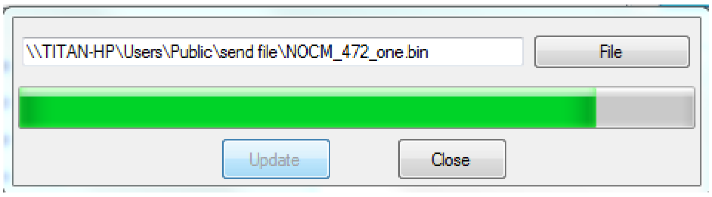


Use the “File” button to browse to the new firmware file and click on “Update” to start upgrading NCAN-1’s device firmware.



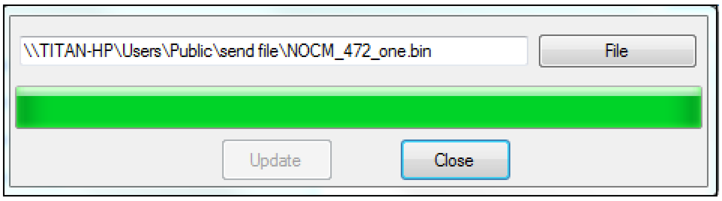
F:\xxxxxxxx.bin

While upgrading, you will find the following message.

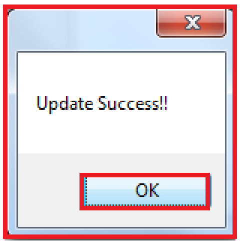


\\TITAN-HP\Users\Public\send file\NOCM_472_one.bin

After successfully upgrading the firmware contents, there will be a message stating “Update Success!!”.



\\TITAN-HP\Users\Public\send file\NOCM_472_one.bin



Update Success!!

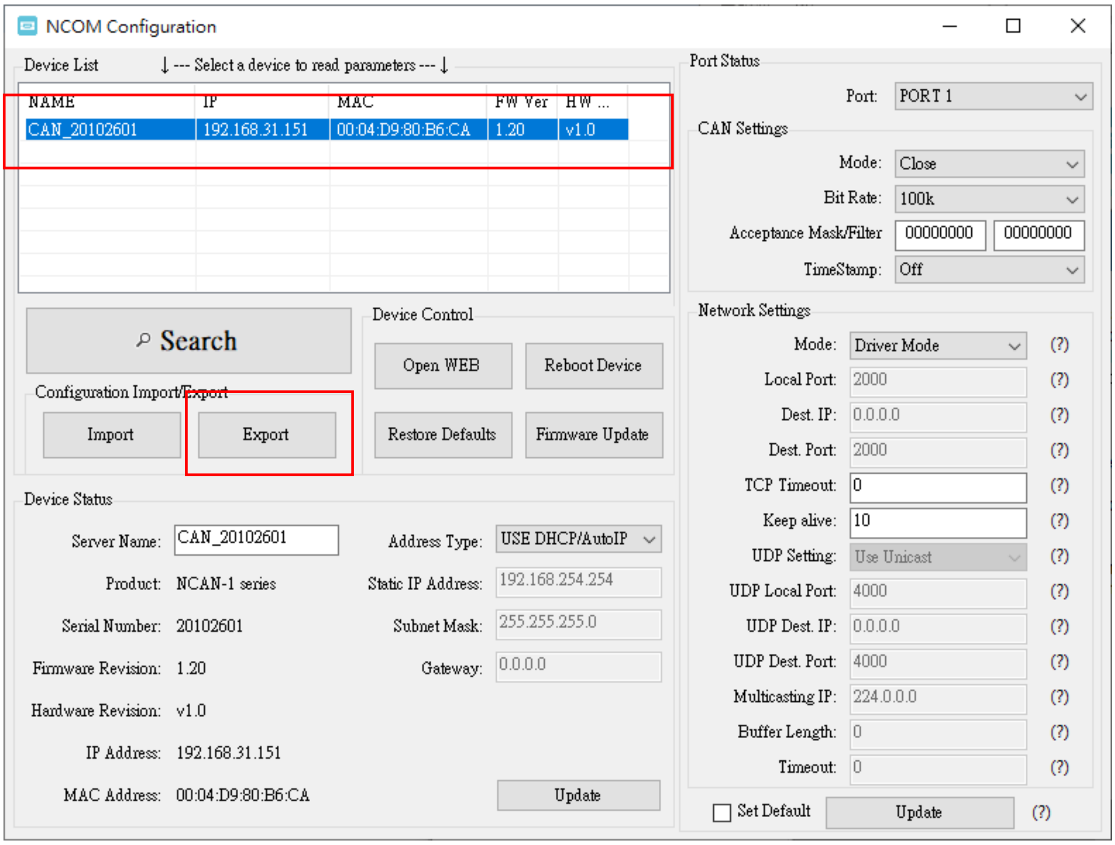
Click on “OK” to finish the firmware update procedure.

8.7.5 Importing/Exporting Configuration Settings

The “Configuration Import/Export” function allows you to back up and recover your NCOM device configuration settings.

8.7.5.1 Exporting Configuration Settings

Select an attached NCOM device then click the “Export” button.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601

Product: NCAN-1 series

Serial Number: 20102601

Firmware Revision: 1.20

Hardware Revision: v1.0

IP Address: 192.168.31.151

MAC Address: 00:04:D9:80:B6:CA

Address Type: USE DHCP/AutoIP

Static IP Address: 192.168.254.254

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Port Status

Port: PORT 1

CAN Settings

Mode: Close

Bit Rate: 100k

Acceptance Mask/Filter: 00000000 00000000

TimeStamp: Off

Network Settings

Mode: Driver Mode (?)

Local Port: 2000 (?)

Dest. IP: 0.0.0.0 (?)

Dest. Port: 2000 (?)

TCP Timeout: 0 (?)

Keep alive: 10 (?)

UDP Setting: Use Unicast (?)

UDP Local Port: 4000 (?)

UDP Dest. IP: 0.0.0.0 (?)

UDP Dest. Port: 4000 (?)

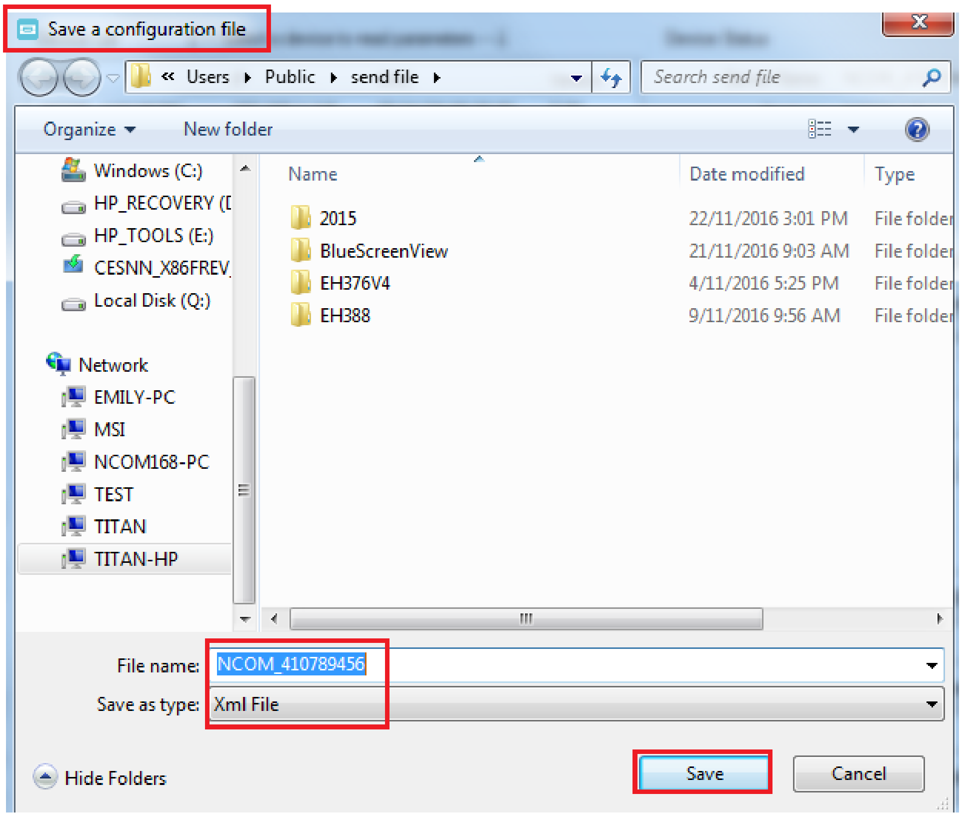
Multicasting IP: 224.0.0.0 (?)

Buffer Length: 0 (?)

Timeout: 0 (?)

□ Set Default

After you click “Export” you will find a “Save a configuration file” page. Click on “Save” to store the NCAN device configuration data to a NCAN_XXXXXXXXX.xml file.



Save a configuration file

« Users ▸ Public ▸ send file ▸

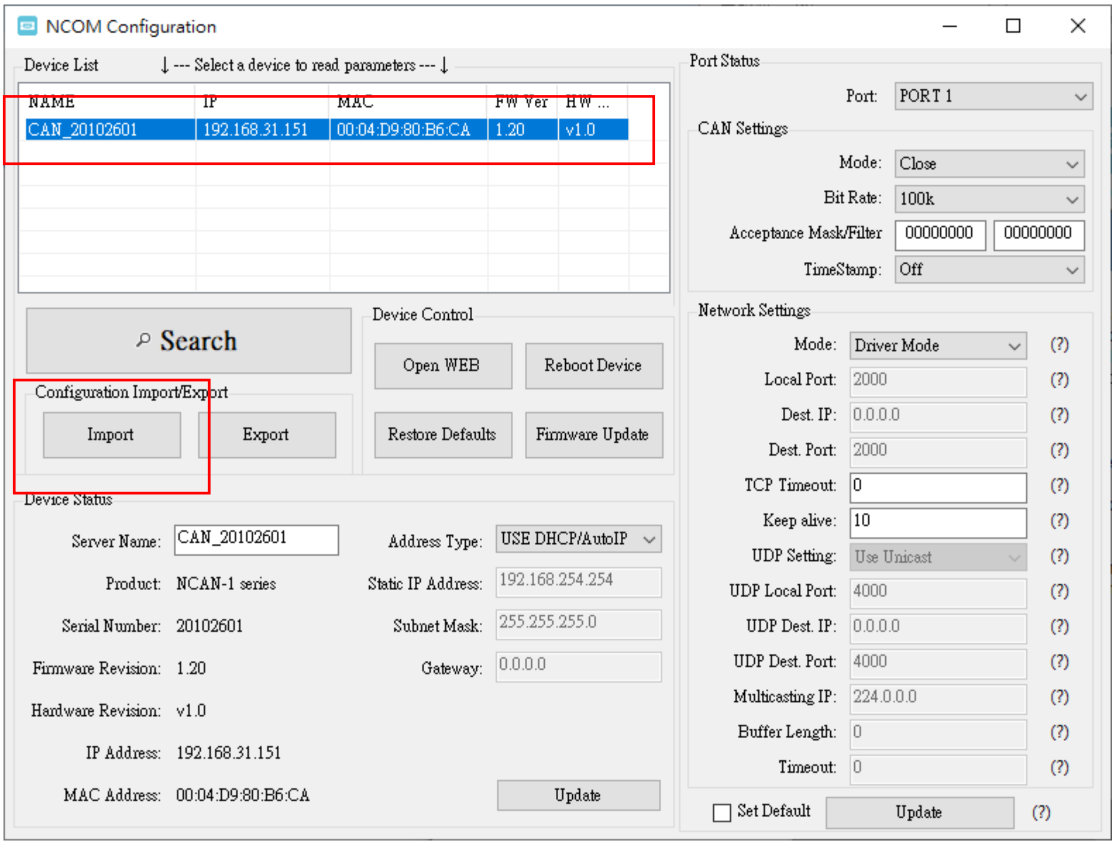
Name	Date modified	Type
2015	22/11/2016 3:01 PM	File folder
BlueScreenView	21/11/2016 9:03 AM	File folder
EH376V4	4/11/2016 5:25 PM	File folder
EH388	9/11/2016 9:56 AM	File folder

File name: NCOM_410789456

Save as type: Xml File

8.7.5.2 Importing Configuration Settings

Select an attached NCOM device then click the “Import” button.



NCOM Configuration

Device List ↓ --- Select a device to read parameters --- ↓

NAME	IP	MAC	FW Ver	HW ...
CAN_20102601	192.168.31.151	00:04:D9:80:B6:CA	1.20	v1.0

Device Status

Server Name: CAN_20102601
Product: NCAN-1 series
Serial Number: 20102601
Firmware Revision: 1.20
Hardware Revision: v1.0
IP Address: 192.168.31.151
MAC Address: 00:04:D9:80:B6:CA
Address Type: USE DHCP/AutoIP
Static IP Address: 192.168.254.254
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

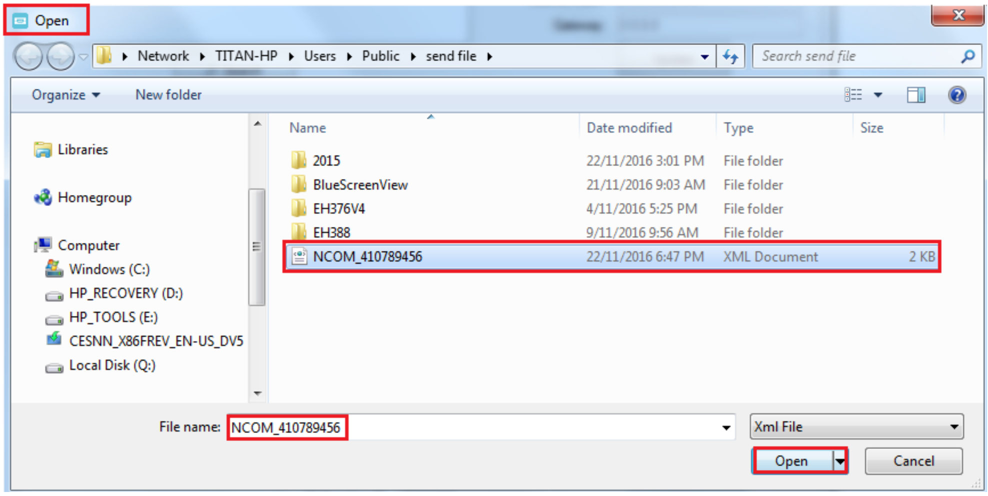
Port Status
Port: PORT 1

CAN Settings
Mode: Close
Bit Rate: 100k
Acceptance Mask/Filter: 00000000 00000000
TimeStamp: Off

Network Settings
Mode: Driver Mode (?)
Local Port: 2000 (?)
Dest. IP: 0.0.0.0 (?)
Dest. Port: 2000 (?)
TCP Timeout: 0 (?)
Keep alive: 10 (?)
UDP Setting: Use Unicast (?)
UDP Local Port: 4000 (?)
UDP Dest. IP: 0.0.0.0 (?)
UDP Dest. Port: 4000 (?)
Multicasting IP: 224.0.0.0 (?)
Buffer Length: 0 (?)
Timeout: 0 (?)

□ Set Default

After you click “Import” you will find an “Open” page, select a NCOM configuration file and click “Open” to start uploading configuration data into NCOM.



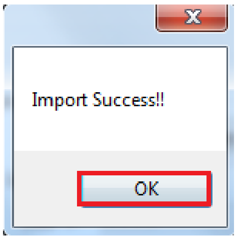
Open

Network ▸ TITAN-HP ▸ Users ▸ Public ▸ send file ▸

Name	Date modified	Type	Size
2015	22/11/2016 3:01 PM	File folder	
BlueScreenView	21/11/2016 9:03 AM	File folder	
EH376V4	4/11/2016 5:25 PM	File folder	
EH388	9/11/2016 9:56 AM	File folder	
NCOM_410789456	22/11/2016 6:47 PM	XML Document	2 KB

File name: NCOM_410789456
Xml File

After all configuration data is uploaded into NCOM device, a message will indicate “Import Success!!”. Click on “OK” to finish importing configuration data.

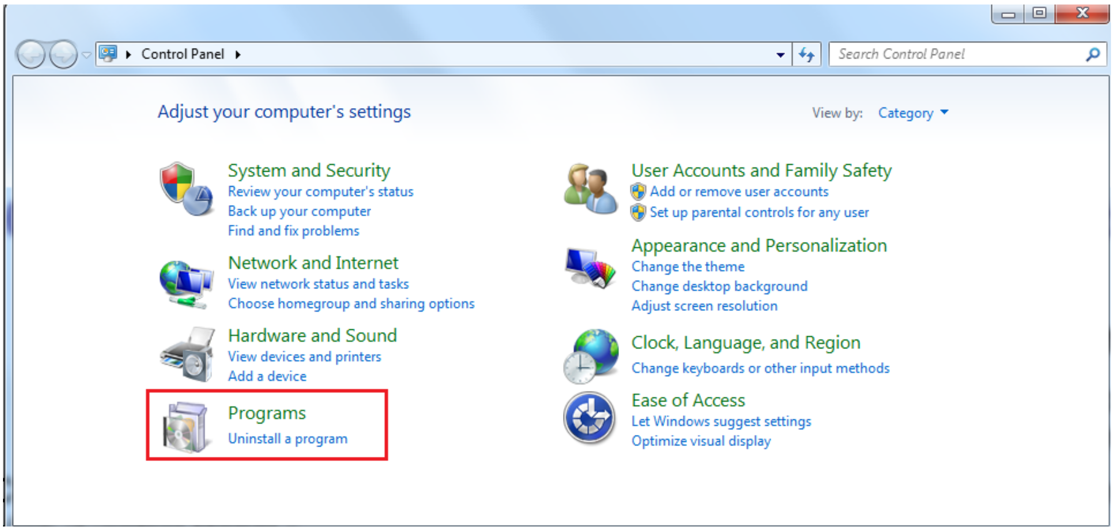


Import Success!!

9. NCOM VIRTUAL SERIAL PORT MANAGER AND DRIVER UNINSTALLATION

9.1 Uninstalling NCOM Virtual Serial Port Manager and Virtual COM Port Driver

To uninstall NCOM Virtual Serial Port Manager and virtual serial port driver, click the "Start" button and navigate to “Control Panel”. Choose "Uninstall a program" under “Programs”.



Control Panel

Search Control Panel

Adjust your computer's settings

View by: Category

System and Security
- Review your computer's status
- Back up your computer
- Find and fix problems

Network and Internet
- View network status and tasks
- Choose homegroup and sharing options

Hardware and Sound
- View devices and printers
- Add a device

Programs
- Uninstall a program

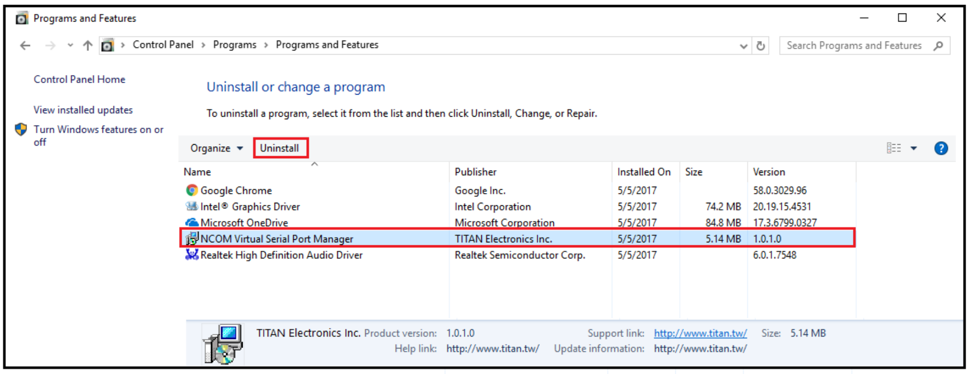
User Accounts and Family Safety
- Add or remove user accounts
- Set up parental controls for any user

Appearance and Personalization
- Change the theme
- Change desktop background
- Adjust screen resolution

Clock, Language, and Region
- Change keyboards or other input methods

Ease of Access
- Let Windows suggest settings
- Optimize visual display

After you click “Uninstall a program”, a page with a list of all your installed programs will be shown. Select “NCOM Virtual Serial Port Manager” and click on “Uninstall” to uninstall NCOM Virtual Serial Port Manager and virtual serial port driver.



Programs and Features

Control Panel › Programs › Programs and Features

Search Programs and Features

Control Panel Home

View installed updates

Turn Windows features on or off

Uninstall or change a program

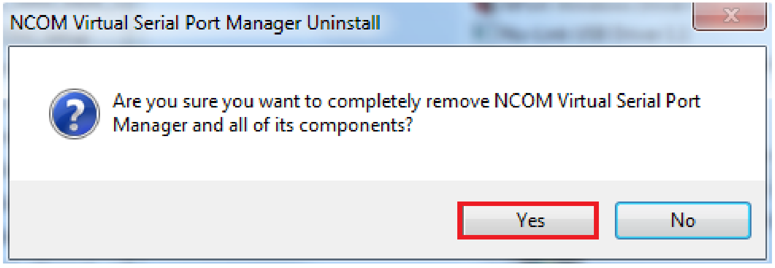
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.

Organize ▾ Uninstall

Name	Publisher	Installed On	Size	Version
Google Chrome	Google Inc.	5/5/2017		58.0.3029.96
Intel® Graphics Driver	Intel Corporation	5/5/2017	74.2 MB	20.19.15.4531
Microsoft OneDrive	Microsoft Corporation	5/5/2017	84.8 MB	17.3.6799.0327
NCOM Virtual Serial Port Manager	TITAN Electronics Inc.	5/5/2017	5.14 MB	1.0.1.0
Realtek High Definition Audio Driver	Realtek Semiconductor Corp.	5/5/2017		6.0.1.7548

TITAN Electronics Inc. Product version: 1.0.1.0 Support link: http://www.titan.tw/ Size: 5.14 MB
Help link: http://www.titan.tw/ Update information: http://www.titan.tw/

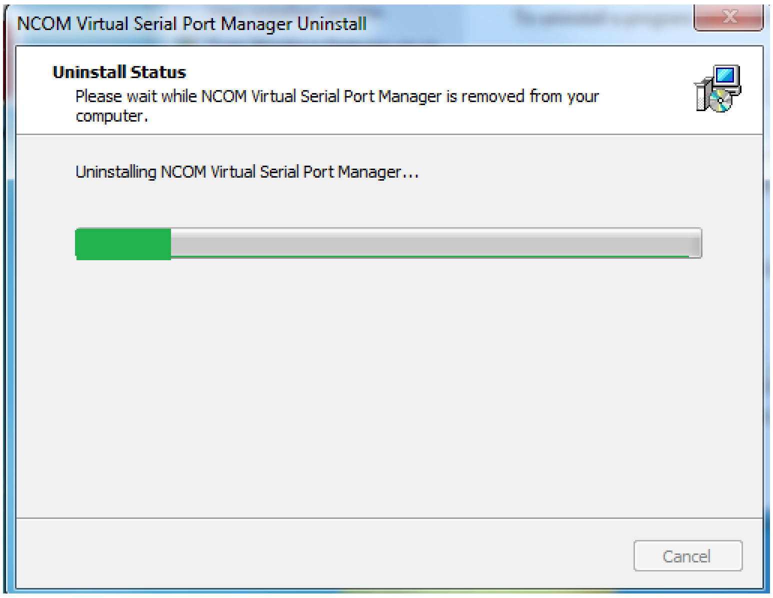
When you click on “Uninstall”, a message will ask “Are you sure you want to completely remove NCOM Virtual Serial Port Manager and all of its components?”. Confirm by click “Yes”.



NCOM Virtual Serial Port Manager Uninstall

Are you sure you want to completely remove NCOM Virtual Serial Port Manager and all of its components?

When uninstalling NCOM Virtual Serial Manager Port and virtual serial port driver in, you will find the following message.



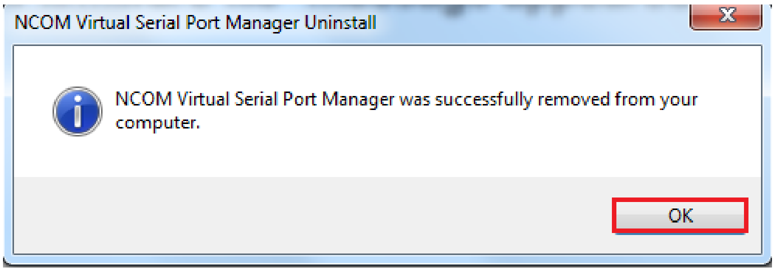
NCOM Virtual Serial Port Manager Uninstall

Uninstall Status

Please wait while NCOM Virtual Serial Port Manager is removed from your computer.

Uninstalling NCOM Virtual Serial Port Manager...

After successfully removing NCOM Virtual Serial Port Manager and virtual serial port driver, a message stating that “NCOM Virtual Serial Port Manager was successfully removed from your computer” will be shown.



NCOM Virtual Serial Port Manager Uninstall

NCOM Virtual Serial Port Manager was successfully removed from your computer.

Click on “OK” to finish removing NCOM Virtual Serial Port Manager and virtual serial port driver.

10. FUNCTION DESCRIPTION

10.1 LED Indicators

The ETHERNET to CAN adapter has two LEDs (green LED & red LED) to indicate CAN bus status for monitoring CAN bus channel status. The green LED indicates CAN bus data activity while the red LED indicates a CAN bus error. Following are the definition of different LED combinations:

A: CAN bus channel open/close
When CAN bus channel opens, the green LED will turn on to indicate that the CAN bus channel is open; When CAN bus channel closes, the green LED will turn off to indicate that the CAN bus channel is closed.

B: CAN Bus Data Activity
When CAN data frame is sent or received, the green LED flashes continuously to indicate CAN bus data I/O activity.

C: CAN Bus Error
When an error occurs on the CAN bus, the red LED flashes continuously to indicated CAN bus error.

10.2 ASCII Command Set

The USB CAN adapter can be registered as a virtual serial port on the host computer. With simple ASCII commands the USB CAN adapter can be controlled over this serial port. User can send/receive commands from any simple serial terminal program.

Example: Set bitrate to 500Kbps, open CAN channel, send CAN frame (ID = 002h, DLC = 3, Data = 11 22 33), close CAN:

Command	Response	Function
S6[CR]	[CR]	Set bitrate of USB CAN adapter to 500Kbps
O[CR]	[CR]	Open CAN channel
t0023112233[CR]	z[CR]	Send CAN message (ID = 002h, DLC = 3, Data = 11 22 33)
C[CR]	[CR]	Close CAN channel

10.2.1 Command list

The commands are line based and terminated with newline character CR (0xD). On error the response will be 0x7 (BELL).

The “help” command (**‘H’, ‘h’ or ‘?’)** will list supported commands.

Command	Response	Function
H[CR]	[CR]	List all supported commands
h[CR]	[CR]	
?[CR]	[CR]	

Example: H[CR]

Return Code
List of Supported Commands:
‘O’ – Open the channel in Normal mode
‘L’ – Open the channel in Listen Only mode
‘Y’ – Open the channel in Loopback mode
‘C’ – Close CAN Channel
‘S’ – Set standard CAN bitrate
‘s’ – Set non-standard CAN bitrate
‘t’ – Transmit a standard frame
‘T’ – Transmit an extended frame
‘r’ – Transmit a standard remote request frame
‘R’ – Transmit an extended remote request frame
‘Z’ – Set timestamp on/off
‘m’ – Set acceptance mask
‘M’ – Set acceptance filter
‘F’ – Read status flag
‘V’ – Check software version
‘N’ – Check serial number
‘m’ – Set acceptance mask
‘M’ – Set acceptance filter
‘RST’ – Reset USB CAN Adapter
‘H’, ‘h’ or ‘?’ – List supported commands

10.2.1.1 Opening the CAN Bus Channel

The CAN bus channel will be opened with the command O[CR], L[CR] or Y[CR]. The command O[CR] will open the CAN bus channel in normal operation mode, the command L[CR] will open the CAN bus channel in listen only mode, in which no bus interaction will be done from the controller. the command Y[CR] will open the CAN bus channel in a loop-back mode, in which the USB to CAN adapter will also receive the frames that it sends. Before you use one of the commands, you should set a bitrate with the commands S or s.

Command	Response	Function
O[CR]	[CR]	Open the channel in Normal mode
L[CR]	[CR]	Open the channel in Listen Only mode
Y[CR]	[CR]	Open the channel in Loopback mode

10.2.1.2 Closing the CAN Bus Channel

The CAN bus channel will be closed with the command C[CR]. The command can only be used if the CAN bus channel is open.

Command	Response	Function
C[CR]	[CR]	Close the CAN channel if it is opened

10.2.1.3 Setting CAN Bitrate (Standard)

The CAN bus bitrate can be set with the command SX[CR]. The command can only be used if the CAN bus channel is closed.

Command	Response	Function
S00[CR]	[CR]	Set the CAN bus bitrate to 5K
S0[CR]	[CR]	Set the CAN bus bitrate to 10K
S1[CR]	[CR]	Set the CAN bus bitrate to 20K
S2[CR]	[CR]	Set the CAN bus bitrate to 50K
S3[CR]	[CR]	Set the CAN bus bitrate to 100K
S4[CR]	[CR]	Set the CAN bus bitrate to 125K
S5[CR]	[CR]	Set the CAN bus bitrate to 250K
S6[CR]	[CR]	Set the CAN bus bitrate to 500K
S7[CR]	[CR]	Set the CAN bus bitrate to 800K
S8[CR]	[CR]	Set the CAN bus bitrate to 1M

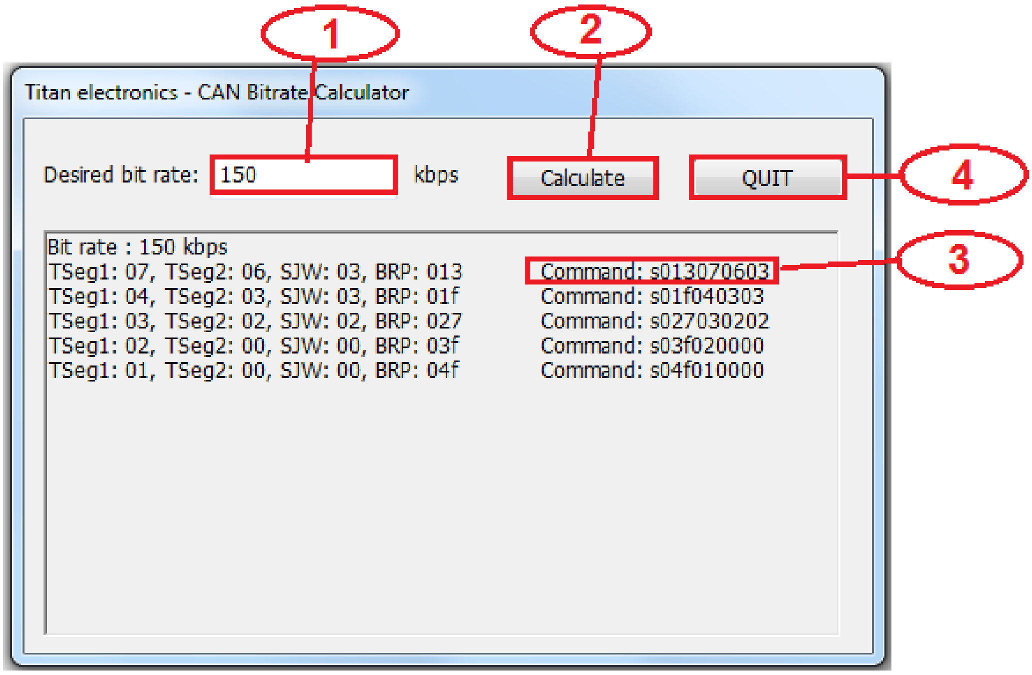
Example: S6[CR] will be set USB CAN adapter to 500K bps CAN Bitrates.

Note: The USB-CAN-SI-M only supports 20 K bits to 1 M bits.

10.2.1.4 Setting CAN Bitrate (Advanced)

A more user defined bus bitrate can be configured with the command sXXXXXXXXX[CR]. As with the standard bus timing command above, you can only use this command when the CAN bus channel is closed.
sXXXXXXXXX [CR] sets the bitrate registers of the CAN controller. Users can set **non-standard bitrates** which are not supported by the "SX" command.
The USB to CAN adapter provides a CAN Bitrate Calculator program to calculate the value of CAN bitrate registers for setting **non-standard bitrates**. Follow these steps to calculate and set **non-standard bitrates** for the USB to CAN adapter:

1. Open the CAN Bitrate Calculator program.
2. Enter CAN Bitrate (“150” for 150Kbps CAN Bitrate) in the field “Desired bitrate:”.
3. Click “Calculate” to calculate the value of CAN bitrate registers.
4. Remember the topmost value of CAN bitrate registers.
5. **e.g. Command: s013070603** for 150 kbps CAN Bitrate.
6. Click “Quit” to exit the CAN Bitrate Calculator program.



```
Bit rate : 150 kbps
TSeg1: 07, TSeg2: 06, SJW: 03, BRP: 013      Command: s013070603
TSeg1: 04, TSeg2: 03, SJW: 03, BRP: 01f      Command: s01f040303
TSeg1: 03, TSeg2: 02, SJW: 02, BRP: 027      Command: s027030202
TSeg1: 02, TSeg2: 00, SJW: 00, BRP: 03f      Command: s03f020000
TSeg1: 01, TSeg2: 00, SJW: 00, BRP: 04f      Command: s04f010000
```

Example: s013070603[CR] will be set the bitrate to 150Kbps.

10.2.1.5 Transmitting a Standard CAN Frame

Transmitting a standard CAN frame (ID: 11 bit) over a CAN bus can be done with the command tiiildddd...dd[CR]. The return value will be z[CR] or the normal error byte (BELL). The command is only available when the CAN bus channel is open.

Command	Response	Function
tiiildddd...dd[CR]	z[CR]	Transmits a standard CAN message (11 bit) over the CAN bus

iii: Standard CAN frame (11 bit) identifier in hexadecimal format (000-7FF).
l: CAN data length (0-8) DLC, with the maximum value being 8 (8 bytes).
dd: Data byte value in hexadecimal format (00-FF). The number of bytes must be equal to the data length field.
Example: t00231199FF[CR] will send a standard CAN frame with ID = 002h, DLC = 3, Data = 11 99 FF.

10.2.1.6 Transmitting a Standard Remote Request CAN Frame

Transmitting a standard remote request CAN frame (ID: 11 bit) over a CAN bus can be done with the command riiil[CR]. The return value will be z[CR] or the normal error byte (BELL). The command is only available when the CAN bus channel is open.

Command	Response	Function
riiil[CR]	z[CR]	Transmits a standard remote request (11 bit) over the CAN bus

iii: Standard remote request CAN frame (11 bit) identifier in hexadecimal format (000-7FF).
l: CAN data length to request (0-8) DLC, with the maximum value being 8 (8 bytes).
Example: r0023[CR] will send a standard remote request CAN frame with ID = 002h, DLC = 3 and request 3 data bytes.

10.2.1.7 Transmitting an Extended CAN Frame

Transmitting an extended CAN frame (ID: 29 bit) over a CAN bus can be done with the command Tiiiiiiiildddd...dd[CR]. The return value will be Z[CR] or the normal error byte (BELL). The command is only available when the CAN bus channel is open.

Command	Response	Function
Tiiiiiiiildddd...dd[CR]	Z[CR]	Transmits an extended CAN frame (11 bit) over the CAN bus

iiiiiiii: Extended CAN frame (29 bit) identifier in hexadecimal format (00000000-1FFFFFFF).
l: CAN data length (0-8) DLC, with the maximum value being 8 (8 bytes).
dd: Data byte value in hexadecimal format (00-FF). The number of bytes must be equal to the data length field.
Example: T1FFFFFFF3112233[CR] will send an extended CAN frame with ID = 1FFFFFFFh, DLC = 3, data = 11 22 33.

10.2.2 Transmitting an Extended Remote Request CAN Frame

Transmitting an extended remote request CAN frame (ID: 29 bit) over a CAN bus can be done with the command Riiiiiiiil[CR]. The return value will be Z[CR] or the normal error byte (BELL). The command is only available when the CAN bus channel is open.

Command	Response	Function
Riiiiiiiil[CR]	Z[CR]	Transmits an extended remote request (29 bit) over the CAN bus

iiiiiiii: Extended remote request CAN frame (29 bit) identifier in hexadecimal format (00000000-1FFFFFFF).
l: CAN data length to request (0-8) DLC, with the DLC maximum value being 8 (8 bytes).
Example: R100000023[CR] will send an extended remote request CAN frame with ID = 10000002h, DLC = 3 and request 3 data bytes.

10.2.2.1 Setting Timestamps ON/OFF

The timestamp command will set the timestamp functionality of received frames ON or OFF. This command is only available when the CAN channel is closed.

Command	Response	Function
Z1[CR]	[CR]	Set the timestamp functionality on received frames ON
Z0[CR]	[CR]	Set the timestamp functionality on received frames OFF

10.2.2.2 *Setting Acceptance Mask*

The acceptance mask, in conjunction with the acceptance code (M), defines which CAN message frames (i.e. of a specific ID or range of CAN IDs) will be passed to the serial interface. The acceptance mask value corresponds to bits within a range of valid CAN IDs for either standard or extended CAN frames. This command is only active if the CAN channel is initiated and not opened.

Set Acceptance Mask (m) command should be executed *prior* to Set Acceptance Code (M).

Note**:** The CAN channel will revert to its prior state after execution. For example, if the channel is open when this command is executed, the channel will update the setting and return to the open state.

Command	Response	Function
miii[CR]	[CR]	Set acceptance mask for standard CAN frame (11 bit) identifier
miiiiiiii[CR]	[CR]	Set acceptance mask for extended CAN frame (29 bit) identifier

iii = standard 11-bit CAN mask (0x000 through 0x7FF)
iiiiiii = extended 29-bit CAN mask (0x00000000 through 0x1FFFFFFF)

A value of "0" in a bit location indicates that the bit location ID value is to be *ignored* when filtering messages.
Default is to pass all frames (acceptance mask = 0x000 for standard messages and 0x00000000 for extended messages)

Example: m700[CR] set acceptance mask to check bits 10, 9 and 8 against the filter. Bits 7 through 0 are ignored as "don't care". Use the acceptance mask in conjunction with the acceptance code, which is explained next.

10.2.2.3 Setting Acceptance Code

The acceptance code/filter, in conjunction with the acceptance mask (m), defines which CAN message frames (i.e. of a specific ID or range of CAN IDs) will be passed to the serial interface. The acceptance code value corresponds to a valid CAN IDs for either standard or extended CAN frames. This command is only active if the CAN channel is initiated and not opened.

The Set Acceptance Mask (m) command should be executed *prior* to the Set Acceptance Code (M) command.

Note**:** The CAN channel will revert to its prior state after execution. For example, if the channel is open when this command is executed, the channel will update the setting and return to the open state.

Command	Response	Function
Miii[CR]	[CR]	Set acceptance code for standard CAN frame (11 bit) identifier
Miiiiiiii[CR]	[CR]	Set acceptance code for extended CAN frame (29 bit) identifier

iii = standard 11-bit CAN mask (0x000 through 0x7FF)
iiiiiiii = extended 29-bit CAN mask (0x00000000 through 0x1FFFFFFF)

Default is to pass all frames (acceptance code = 0x7FF for standard messages and 0x1FFFFFF for extended messages)

Example: m1FF[CR] sets acceptance code to receive standard messages with the CAN ID of 0x1FF. If used in conjunction with the acceptance mask example above, frames of the range 0x100 through 0x1FF will be passed, and all other CAN IDs will be blocked.

10.2.2.4 Getting Status Flags

User can use the command F[CR] to get the status bits when an error occurs. A two-byte BCD number is returned to correspond to the 8-bits of the internal register of the CAN controller.

Command	Response	Function
F[CR]	XX[CR]	Get CAN bus status

Return Codes
XX[CR]
XX = CAN bus status (A bit set to “1” indicates a true condition):

Bits 2, 1, 0**:** Last Error Code(LEC), The LEC field holds a code, which indicates the type of the last error to occur on the CAN bus.

LEC Bits 2, 1, 0	Meaning
Error Code 0 0, 0, 0	No error.
Error Code 1 0, 0, 1	Stuff error: more than 5 equal bits in a sequence have occurred in a part of a received message where this is not allowed.
Error Code 2 0, 1, 0	Form error: a fixed format part of a received frame has the wrong format.
Error Code 3 0, 1, 1	ACK Error: the message this CAN core transmitted was not acknowledged by another node.
Error Code 4 1, 0, 0	Bit 1 error: during the transmission of a message (with the exception of the arbitration field), the device wanted to send a recessive level (bit of logical value “1”), but the monitored bus value was dominant.
Error Code 5 1, 0, 1	Bit 0 error: Bit 1 error: during the transmission of a message (or acknowledged bit, or active error flag, or overload flag), the device wanted to send a dominant level (bit of logical value “0”), but the monitored bus value was recessive. During the bus-off recovery, this status is set each time a sequence of 11 recessive bits have been monitored. This enables the CPU to monitor the proceedings of the bus-off recovery sequence (indicating the bus is not stuck at dominant or continuously disturbed).
Error Code 6 1, 1, 0	CRC error: the CRC checksum was incorrect in the message received, the CRC received for an incoming message does not match with the calculated CRC for the received data.
Error Code 7 1, 1, 1	Unused: no CAN bus event was detected since the CPU wrote this value to the LEC.

Bit 3: Transmitted a message successfully
1 = Since this bit was last reset by CPU, a message has been successfully (error-free and acknowledged by at least one other node) transmitted.
0 = Since this bit was last reset by CPU, no message has been transmitted.

Bit 4: Received a message successfully
1 = A message has been successfully received since this bit was last reset by CPU (independent of the result of acceptance filtering).
0 = No message has been successfully received since this bit was last reset by CPU

Bit 5: Error Passive (Read only)
1 = The CAN core is in the error passive state as defined in the CAN specification.
0 = The CAN core is in the error active.

Bit 6: Error Warning Status (Read only)
1 = At least one of the error counters in the EML (Error Management Logic) has reached the error warning limit of 96.
= Both error counters are below the error warning limit of 96.

Bit 7: Bus-off Status (Read only)
1 = The CAN Module is in bus-off state.
0 = The CAN Module is not in bus-off state.

<BELL> = ERROR

Bit 0 ~ Bit 7 returned to correspond to the 8-bits of the internal register of the CAN controller.

10.2.2.5 Getting Version Information

The command V[CR] to retrieve the current firmware version of the USB CAN adapter.

Command	Response	Function
V[CR]	VXXXX[CR]	Get the current firmware version of the USB CAN adapter

This command is always available and will return the version information formatted like this: VXXXX[CR].

10.2.2.6 Getting Serial Number

The command N[CR] will retrieve the serial number of the USB CAN adapter.

Command	Response	Function
N[CR]	TXXXXXXXX[CR]	Get the serial number of the USB CAN adapter

This command is always available and will return the decimal serial number like this: TXXXXXXX[CR].

10.2.2.7 Resetting the USB CAN adapter

The command RST[CR] will reset the USB CAN adapter.

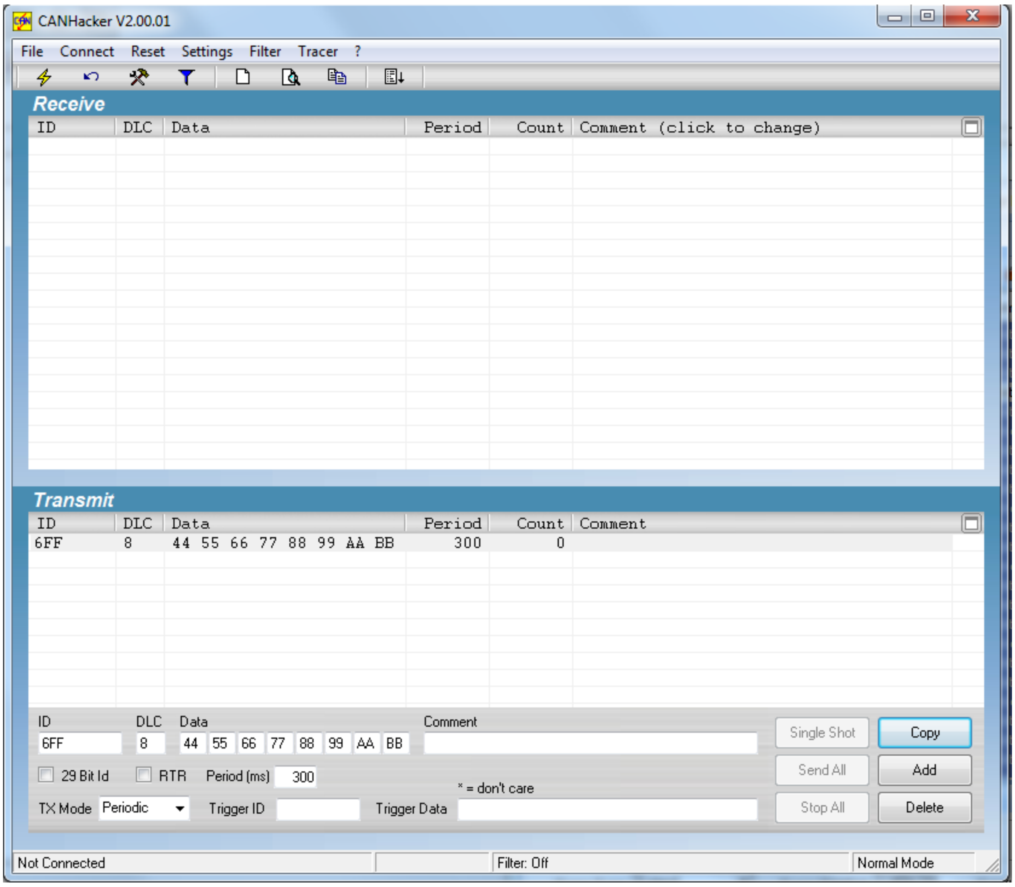
Command	Response	Function
RST[CR]	-	Reset the USB CAN adapter

This command is always available.

11. TOOLS

11.1 CANHacker

CANHacker is a Windows application software for analyzing and transmitting/receiving CAN frames. The CANHacker software has a friendly interface and is easy to use. Through the software user can easily test and analyze the CAN frames. Following shows its main panel:



Receive

ID	DLC	Data	Period	Count	Comment (click to change)

Transmit

ID	DLC	Data	Period	Count	Comment
6FF	8	44 55 66 77 88 99 AA BB	300	0	

ID: 6FF DLC: 8 Data: 44 55 66 77 88 99 AA BB Comment:

□ 29 Bit Id □ RTR Period (ms) 300

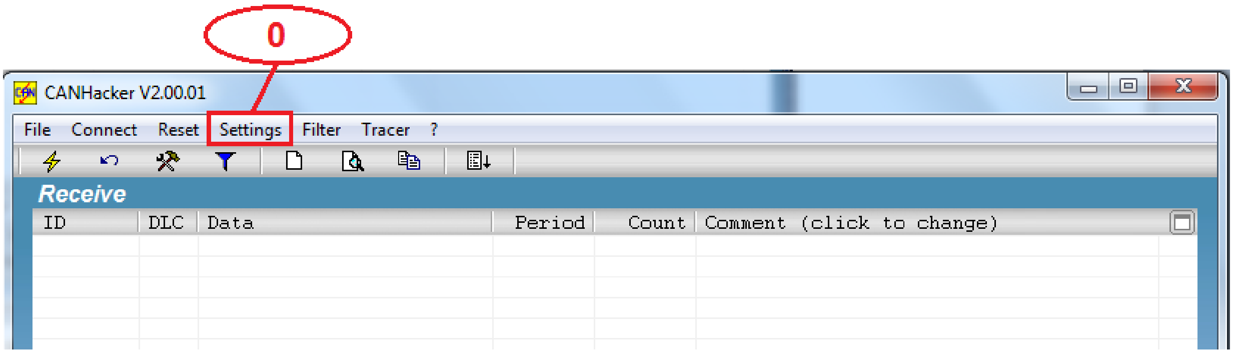
TX Mode Periodic Trigger ID Trigger Data

Not Connected | Filter: Off | Normal Mode

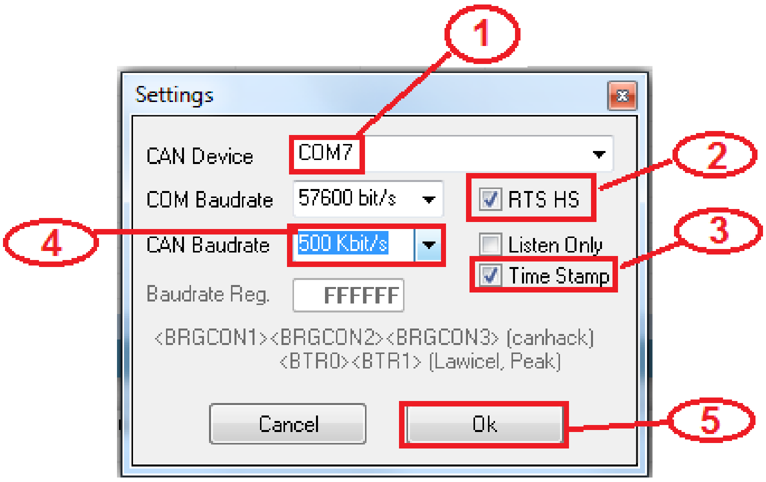
The following sections will briefly introduce the necessary steps on how to use the software.

Settings procedure for selecting and configuring the USB to CAN adapter

1. Open CANHacker and click “Settings” under the menu.



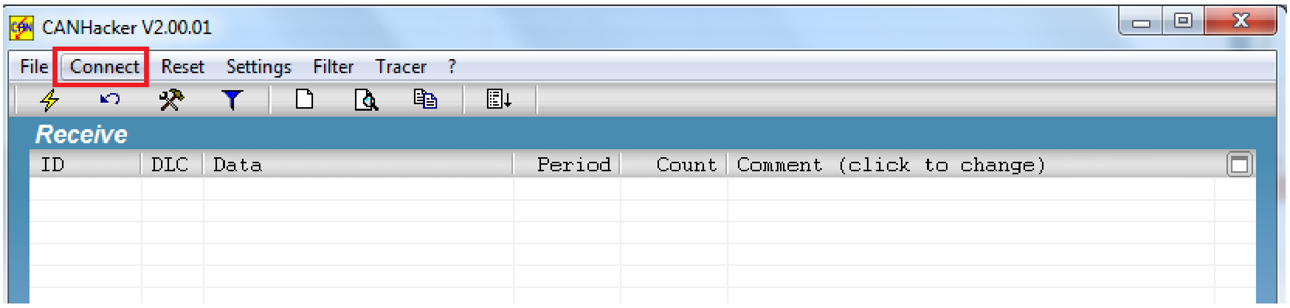
2. Select COM port of the USB to CAN adapter.
3. Check “RTS HS” to enable RTS handshake function.
4. Check “Time Stamp” to enable timestamp function.
5. Select CAN Baudrate for the CAN bus operating speed.
6. Finally, click “OK” to finish the settings and return to the main panel.


Settings

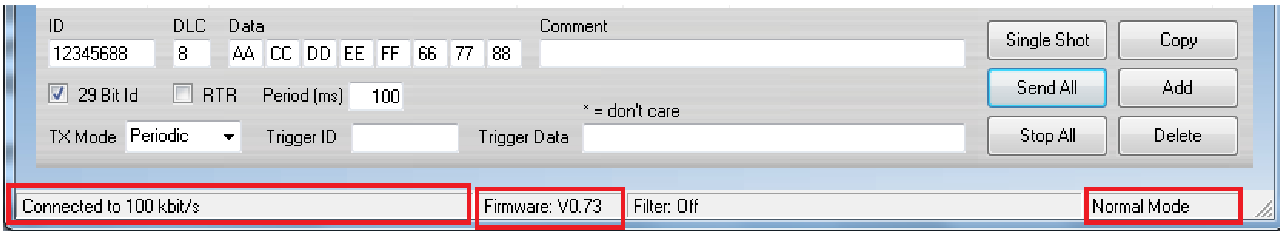
CAN Device: COM7
COM Baudrate: 57600 bit/s
☑ RTS HS
CAN Baudrate: 500 Kbit/s
□ Listen Only
☑ Time Stamp
Baudrate Reg.: FFFFFF

<BRGCON1><BRGCON2><BRGCON3> (canhack)
<BTR0><BTR1> (Lawicel, Peak)

You may connect the USB to CAN adapter after configuration. Click “Connect”, as shown in the figure, to start the CANHacker software operation.



When USB to CAN adapter successfully connects, you will find the message “Connected to XXX kbits/s”, firmware version VXXXX and operation mode at the bottom of the main panel.



ID 12345688

DLC 8

Data AA CC DD EE FF 66 77 88

Comment

☑ 29 Bit Id □ RTR Period (ms) 100

* = don't care

TX Mode Periodic

Trigger ID

Trigger Data

Connected to 100 kbit/s

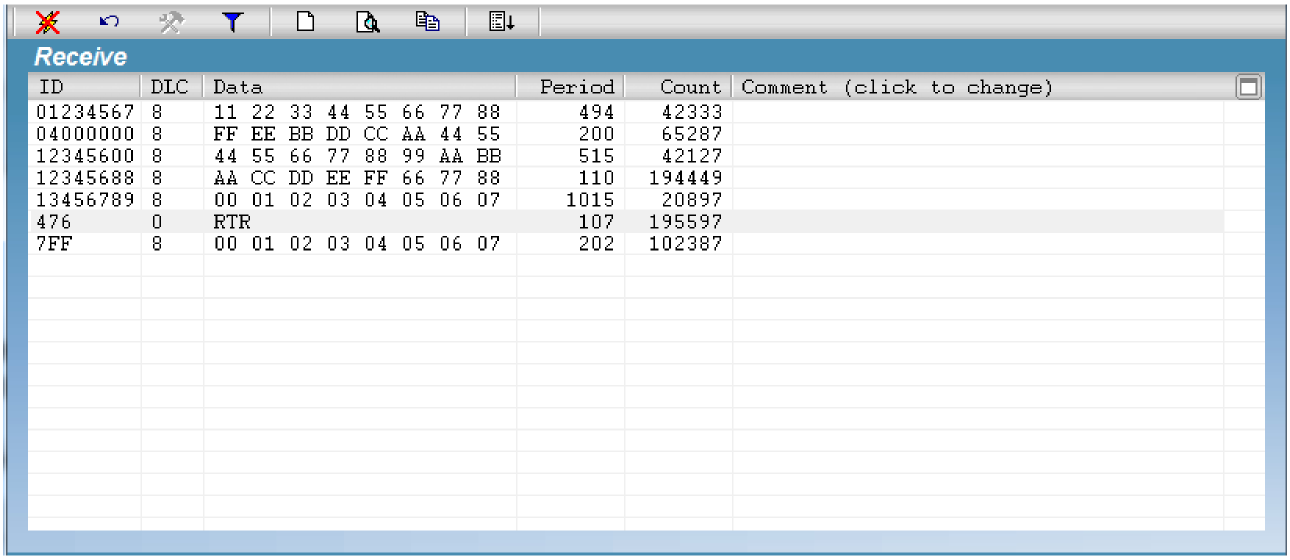
Firmware: V0.73

Filter: Off

Normal Mode

Receiving CAN frames

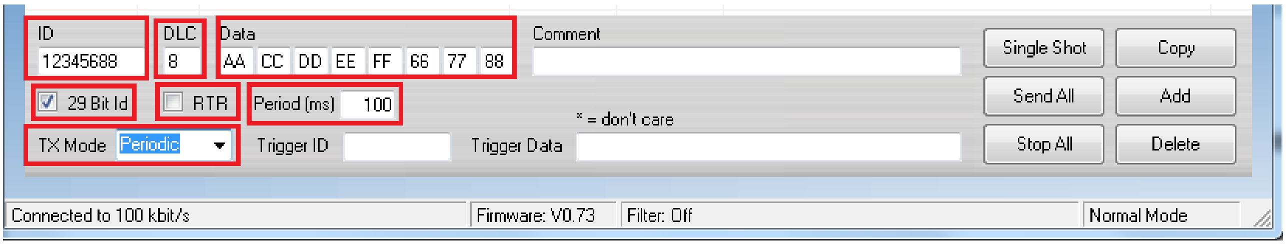
When CANHacker receives CAN frames from another CAN node, it will show all CAN frame messages in the middle of main panel. The CAN frame messages includes ID, DLC, Data, Period, Count.



ID	DLC	Data	Period	Count	Comment (click to change)
01234567	8	11 22 33 44 55 66 77 88	494	42333	
04000000	8	FF EE BB DD CC AA 44 55	200	65287	
12345600	8	44 55 66 77 88 99 AA BB	515	42127	
12345688	8	AA CC DD EE FF 66 77 88	110	194449	
13456789	8	00 01 02 03 04 05 06 07	1015	20897	
476	0	RTR	107	195597	
7FF	8	00 01 02 03 04 05 06 07	202	102387	

Sending CAN frames

CANHacker provides many parameters for sending CAN frames to another CAN node, you can set the following parameters on the bottom of the main panel for CAN data transmission:



ID 12345688
DLC 8
Data AA CC DD EE FF 66 77 88
Comment
☑ 29 Bit Id
□ RTR
Period (ms) 100
* = don't care
TX Mode Periodic
Trigger ID
Trigger Data

Connected to 100 kbit/s | Firmware: V0.73 | Filter: Off | Normal Mode

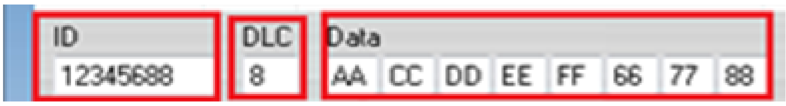
Select transmit an extended CAN Frame (29 bits ID) or a standard CAN frame (11 bits ID).

Check “29 Bit Id” ☑ 29 Bit Id to transmit an extended CAN Frame (29 bits ID) and uncheck “29 Bit Id” □ 29 Bit Id to transmit a standard CAN frame (11 bits ID).

Select remote request frame mode or transmit CAN frame mode.

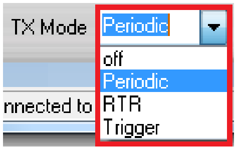
Check “RTR” ☑ RTR for a remote request frame mode or uncheck “RTR” □ RTR for transmit CAN frame mode.

Enter CAN frame messages in the respective fields, including ID, DLC, Data.



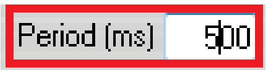
ID	DLC	Data							
12345688	8	AA	CC	DD	EE	FF	66	77	88

In “TX Mode” dialog box, you can select “off”, “Periodic”, “RTR”, “Trigger” modes.



TX Mode Periodic

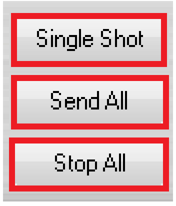
When “Periodic” mode is selected, you can enter “Period(ms)” to send CAN frames message repeatedly (enter “500” to send CAN messages every 500ms).



Period (ms) 500

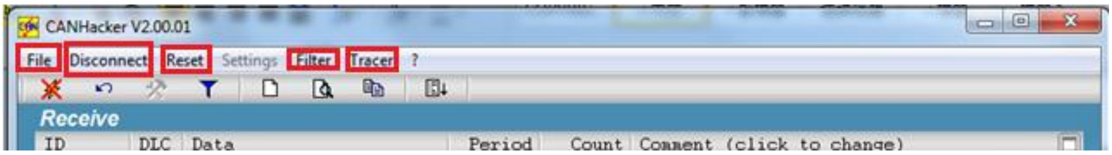
To send a single CAN frame message, click “Single Shot”. Click “Send All” to send CAN frames message repeatedly.

To stop sending CAN frame messages, click “Stop All”.



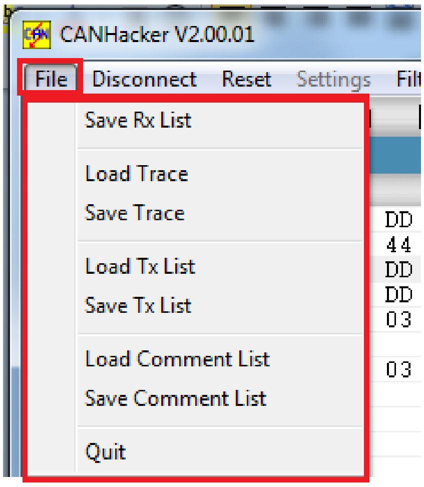
Assistant features

There are many assistant features included in CANHacker, as shown in the figure below:

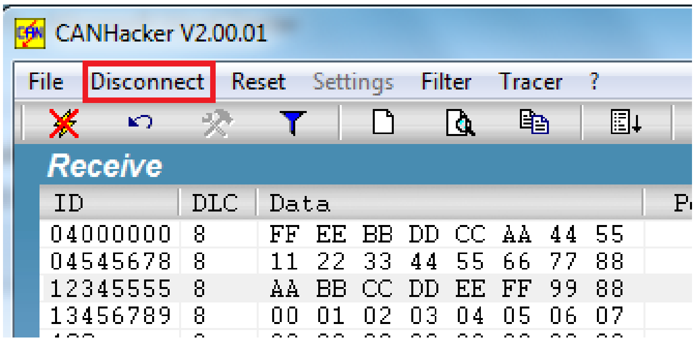


Saving data to file or loading data from file:

Select “File” option to save Rx List, Trace, Tx List, Command List and Load Trace, Tx List, Command List.

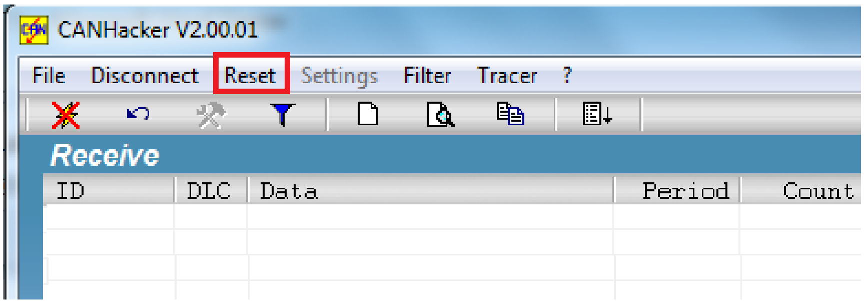


Click “Disconnect” to stop CANHacker.

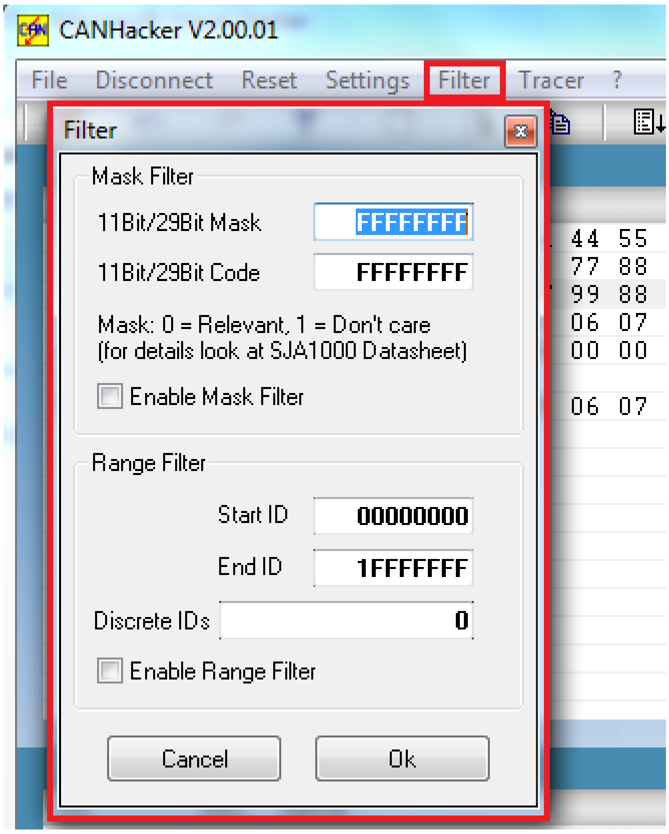


ID	DLC	Data	P
04000000	8	FF EE BB DD CC AA 44 55	
04545678	8	11 22 33 44 55 66 77 88	
12345555	8	AA BB CC DD EE FF 99 88	
13456789	8	00 01 02 03 04 05 06 07	

Click “Reset” to renew the received CAN frame messages and reset the transmission (received) count.



Select “Filter” to set mask filter and range filter.



Mask Filter

11Bit/29Bit Mask: FFFFFFFF

11Bit/29Bit Code: FFFFFFFF

Mask: 0 = Relevant, 1 = Don't care
(for details look at SJA1000 Datasheet)

□ Enable Mask Filter

Range Filter

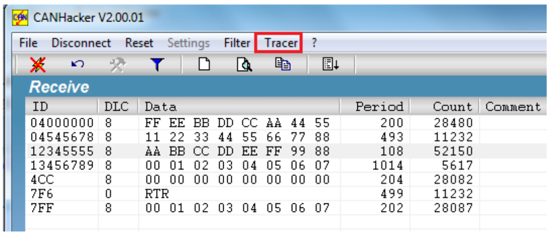
Start ID: 00000000

End ID: 1FFFFFFF

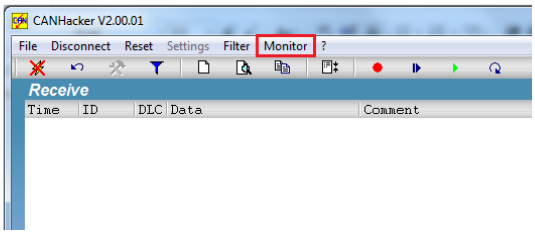
Discrete IDs: 0

□ Enable Range Filter

Select “Tracer” or “Monitor” to trace or monitor the CAN frame messages.



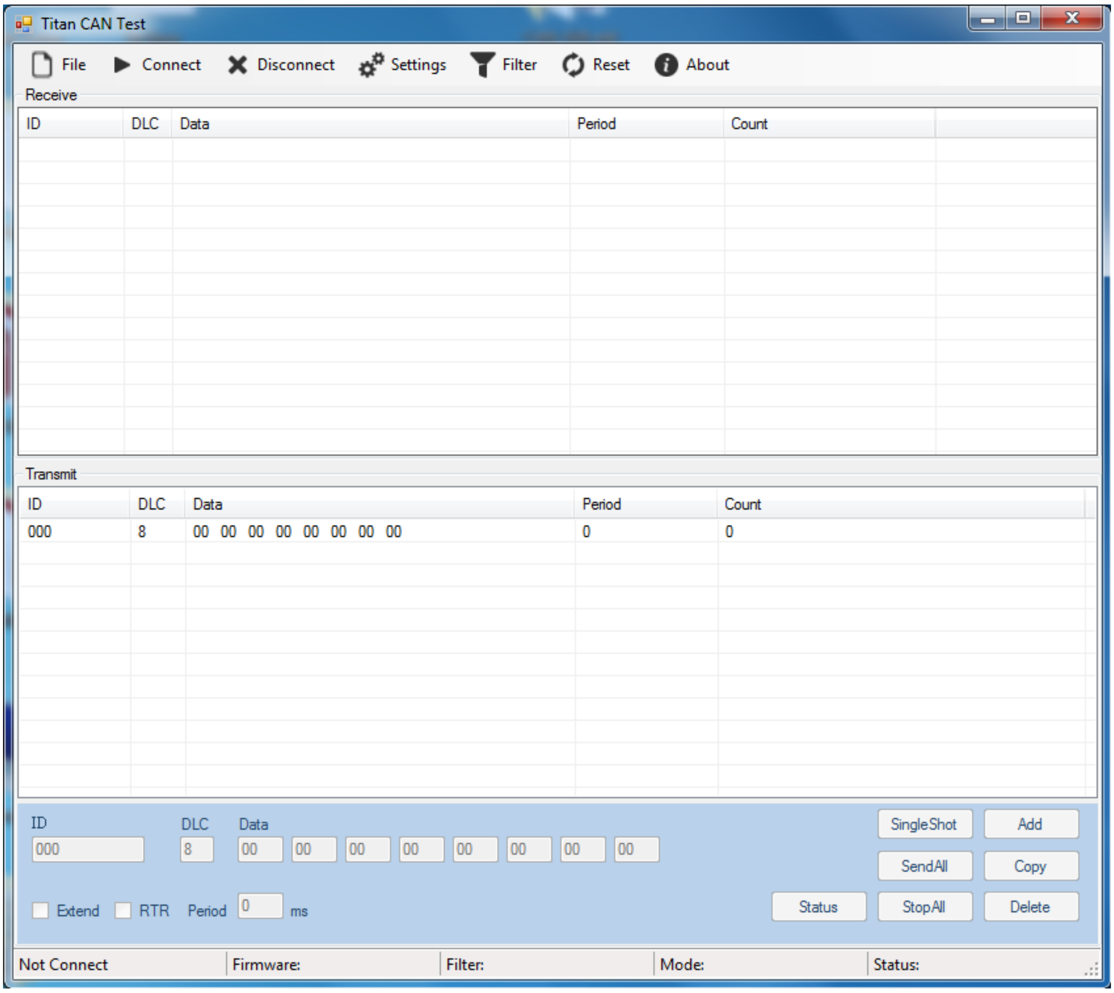
ID	DLC	Data	Period	Count	Comment
04000000	8	FF EE BB DD CC AA 44 55	200	28480	
04545678	8	11 22 33 44 55 66 77 88	493	11232	
12345555	8	AA BB CC DD EE FF 99 88	108	52150	
13456789	8	00 01 02 03 04 05 06 07	1014	5617	
4CC	8	00 00 00 00 00 00 00 00	204	28082	
7F6	0	RTR	499	11232	
7FF	8	00 01 02 03 04 05 06 07	202	28087	



11.2 Titan CAN Test Program

Titan CAN test program is a Windows application software for testing and transmitting/receiving CAN frames. The Titan CAN test program is an easy to use software. Through the software users can easily test and analyze the CAN frames.

Following shows its main panel:



Receive

ID	DLC	Data	Period	Count

Transmit

ID	DLC	Data	Period	Count
000	8	00 00 00 00 00 00 00 00	0	0

ID: 000 DLC: 8 Data: 00 00 00 00 00 00 00 00

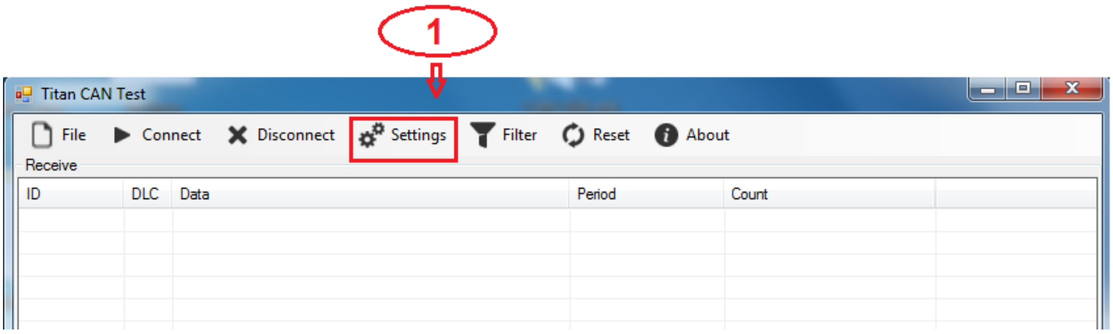
□ Extend □ RTR Period: 0 ms

Not Connect	Firmware:	Filter:	Mode:	Status:

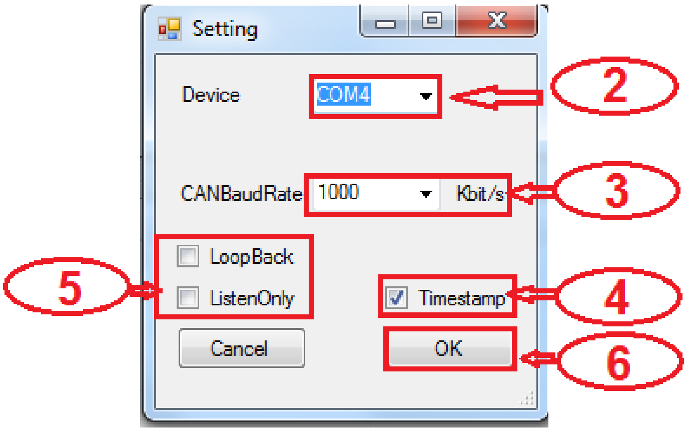
The following section will briefly introduce the necessary steps on how to use the Titan CAN test program.

Settings procedure for selecting and configuring the USB to CAN adapter

1. Open Titan CAN test program and click “**Settings**” under the menu.



2. Select COM port of the USB to CAN adapter.
3. Select CAN Baudrate for the CAN bus operating speed.
4. Check “Time Stamp” to enable timestamp function.
5. Check “LoopBack” or “ListenOnly” to open the CAN bus adapter in loopback or listen only operation mode, otherwise the CAN bus adapter will open in normal operation mode.
6. Finally, click “OK” to finish the settings and return to the main panel.



Device COM4

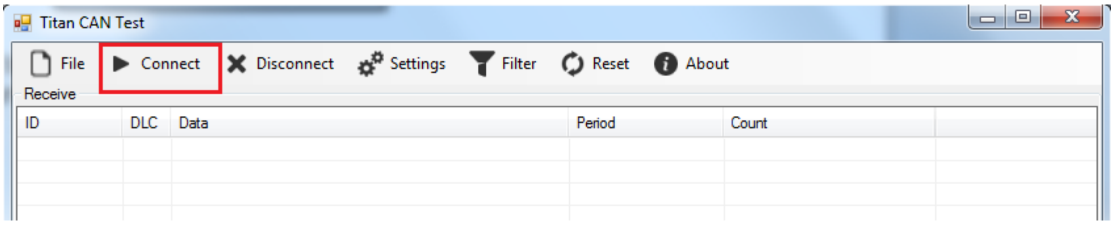
CANBaudRate 1000 Kbit/s

□ LoopBack

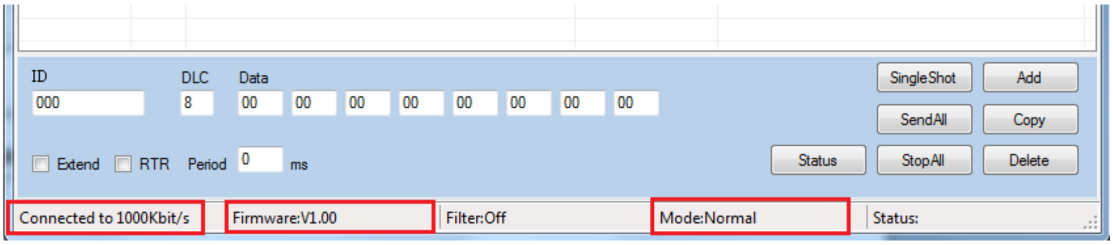
□ ListenOnly

☑ Timestamp

You may connect the USB to CAN adapter after configuration. Click “**Connect**”, as shown in the figure, to start the Titan CAN test program operation.



When USB to CAN adapter successfully connects, you will find the message “Connected to XXX kbits/s”, firmware version VXXXX and operation mode at the bottom of the main panel.



ID 000

DLC 8

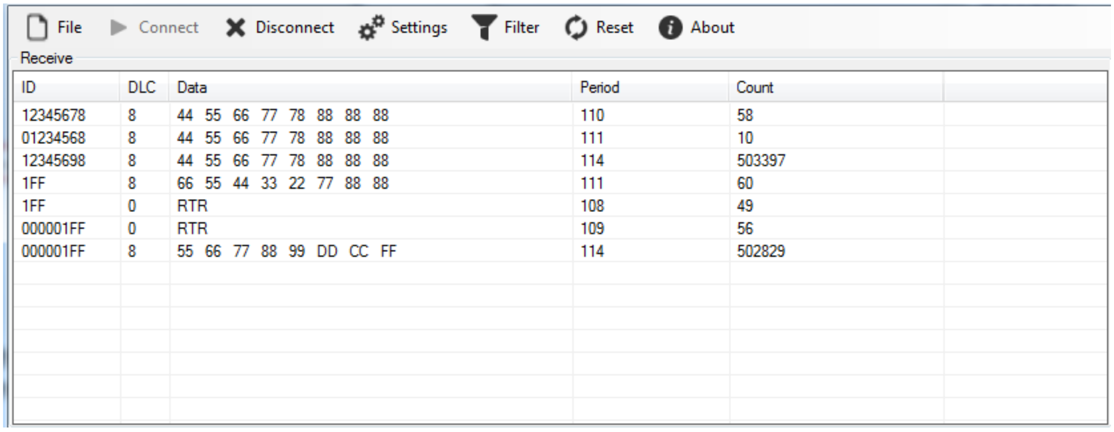
Data 00 00 00 00 00 00 00 00

□ Extend □ RTR Period 0 ms

Connected to 1000Kbit/s | Firmware:V1.00 | Filter:Off | Mode:Normal | Status:

Receiving CAN frames

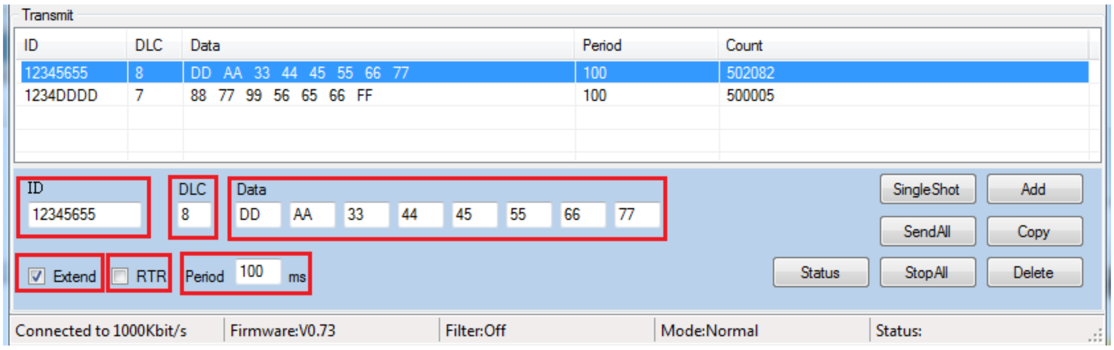
When Titan CAN test program receives CAN frames from another CAN node, it will show all CAN frame messages in middle of main panel. The CAN frame messages includes ID, DLC, Data, Period, Count.



ID	DLC	Data	Period	Count
12345678	8	44 55 66 77 78 88 88 88	110	58
01234568	8	44 55 66 77 78 88 88 88	111	10
12345698	8	44 55 66 77 78 88 88 88	114	503397
1FF	8	66 55 44 33 22 77 88 88	111	60
1FF	0	RTR	108	49
000001FF	0	RTR	109	56
000001FF	8	55 66 77 88 99 DD CC FF	114	502829

Sending CAN frames

Titan CAN test program provides many parameters for sending CAN frames to another CAN node, you can set the following parameters on the bottom of the main panel for CAN data transmission:



ID	DLC	Data	Period	Count
12345655	8	DD AA 33 44 45 55 66 77	100	502082
1234DDDD	7	88 77 99 56 65 66 FF	100	500005

ID: 12345655 DLC: 8 Data: DD AA 33 44 45 55 66 77

☑ Extend □ RTR Period 100 ms

Connected to 1000Kbit/s | Firmware:V0.73 | Filter:Off | Mode:Normal | Status:

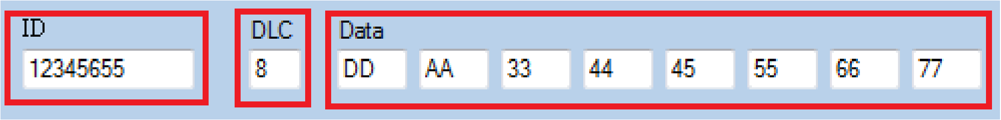
Select transmit an extended CAN frame (29 bits ID) or a standard CAN frame (11 bits ID).

Check “Extend” ☑ Extend to transmit an extended CAN Frame (29 bits ID) and uncheck “Extend” □ Extend to transmit a standard CAN frame (11 bits ID).

Select remote request frame mode or transmit CAN frame mode.

Check “RTR” ☑ RTR for a remote request frame mode or uncheck “RTR” □ RTR for transmit CAN frame mode.

Enter CAN frame messages in the respective fields, including ID, DLC, Data.

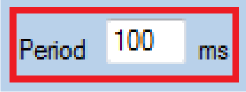


ID: 12345655

DLC: 8

Data: DD AA 33 44 45 55 66 77

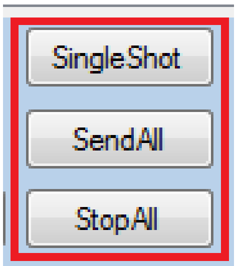
When “Periodic” mode is selected, you can enter “Period(ms)” to send CAN frames message repeatedly (enter “100” to send CAN messages every 100ms).



Period 100 ms

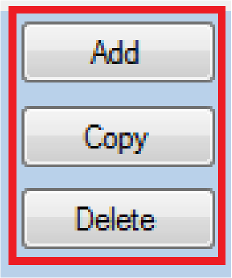
To send a single CAN frame message, click “Single Shot”. Click “Send All” to send CAN frames message repeatedly.

To stop sending CAN frame messages, click “Stop All”.



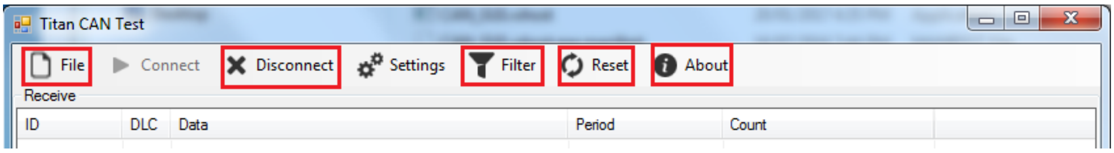
To add a new send CAN frame message, click “Add” to add new send CAN frame message and click “Copy” to copy a send CAN frame message repeatedly.

To delete a send CAN frame message, click “Delete” to delete send CAN frame message.

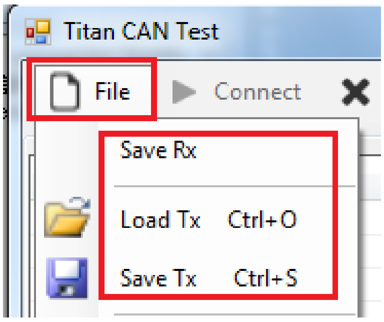


Assistant features

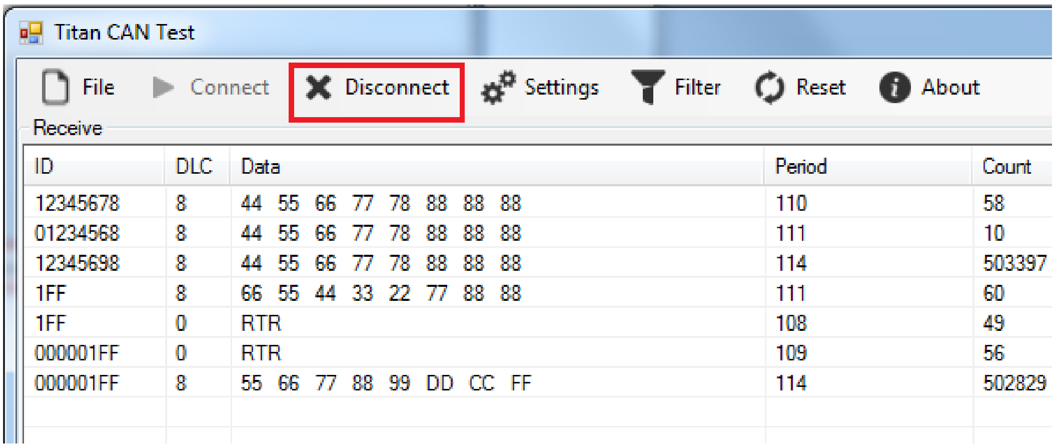
There are many assistant features included in Titan CAN test program, as shown in the figure below:



Select “**File**” option to save Rx List, Tx List and Load Tx List.

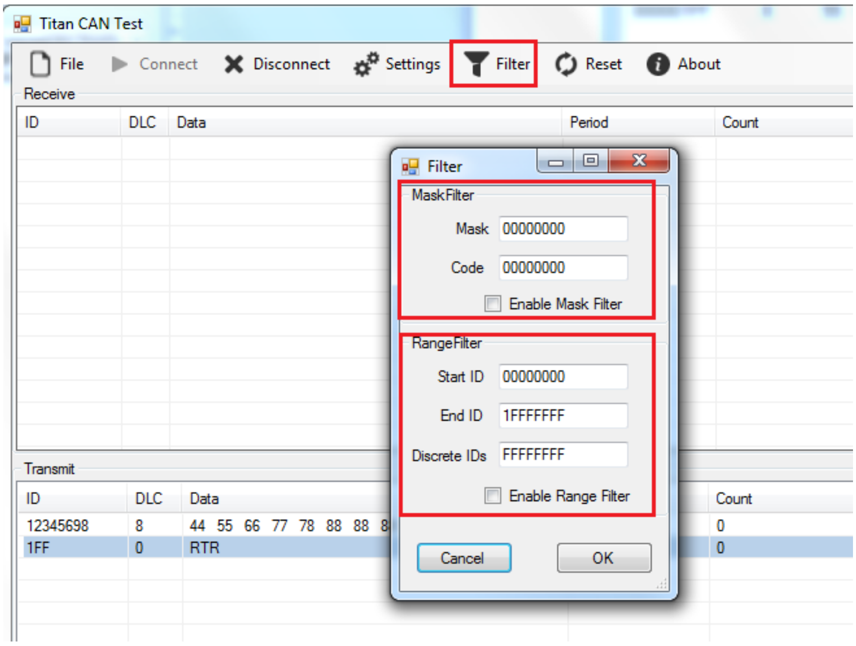


Click “**Disconnect**” to stop Titan CAN test program.



ID	DLC	Data	Period	Count
12345678	8	44 55 66 77 78 88 88 88	110	58
01234568	8	44 55 66 77 78 88 88 88	111	10
12345698	8	44 55 66 77 78 88 88 88	114	503397
1FF	8	66 55 44 33 22 77 88 88	111	60
1FF	0	RTR	108	49
000001FF	0	RTR	109	56
000001FF	8	55 66 77 88 99 DD CC FF	114	502829

Select “**Filter**” to set mask filter and range filter.



ID	DLC	Data	Period	Count

ID	DLC	Data	Count
12345698	8	44 55 66 77 78 88 88 8	0
1FF	0	RTR	0

Filter

MaskFilter

Mask 00000000

Code 00000000

□ Enable Mask Filter

RangeFilter

Start ID 00000000

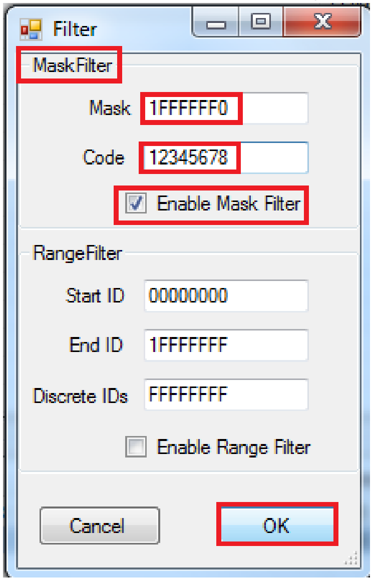
End ID 1FFFFFFF

Discrete IDs FFFFFFFF

□ Enable Range Filter

Mask Filter: Set "Acceptance Code Register" and "Acceptance Mask Register" for CAN bus controller to specify the CAN IDs that are passed or blocked; after setting "Mask" and "Code", check "Enable Mask Filter" then click "OK" to finish the Mask Filter settings and return to the main panel.

Note: Before you set the "Mask Filter" function, you need to disconnect the USB adapter. After setting the value of "Mask" + "Code", connect the USB adapter again to enable the "Mask Filter" function, because the "Mask Filter" function is only available if the CAN adapter is initiated and not opened.



MaskFilter

Mask 1FFFFFF0

Code 12345678

☑ Enable Mask Filter

RangeFilter

Start ID 00000000

End ID 1FFFFFFF

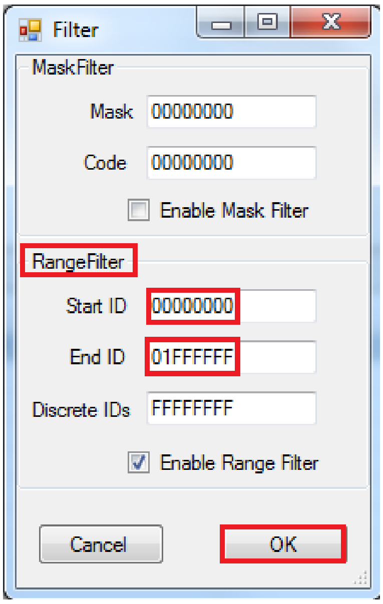
Discrete IDs FFFFFFFF

□ Enable Range Filter

Mask Filter example: After setting "Mask" to 1FFFFFF0 and "Code" to 12345678, CAN message frames of the range 0x12345670 through 0x1234567F will be passed and all other CAN IDs will be blocked.

Range Filter: Set "Start ID" and "Stop ID" for USB CAN adapter to specify a range of

CAN IDs that are to be passed; after setting "Start ID" and "Stop ID", check "Enable Range Filter" then click "OK" to finish the Ranger Filter settings and return to the main panel.



Mask 00000000

Code 00000000

☐ Enable Mask Filter

Start ID 00000000

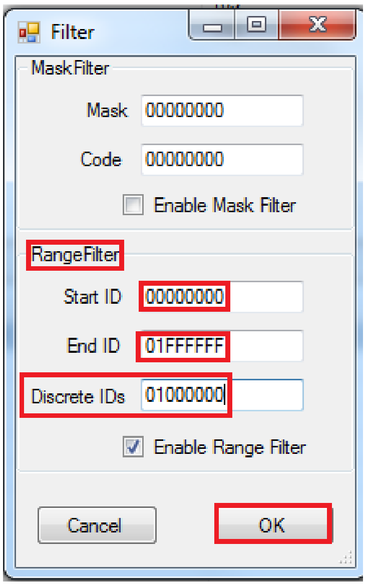
End ID 01FFFFFF

Discrete IDs FFFFFFFF

☑ Enable Range Filter

Range Filter example: After setting "Start ID" to 00000000 and "End ID" to 01FFFFFF, The CAN message frames of the range 0x00000000 through 0x01FFFFFF will be passed and all other CAN IDs will be blocked.

The Range Filter can also set "Discrete IDs" to block a unique CAN ID.



Mask 00000000

Code 00000000

☐ Enable Mask Filter

Start ID 00000000

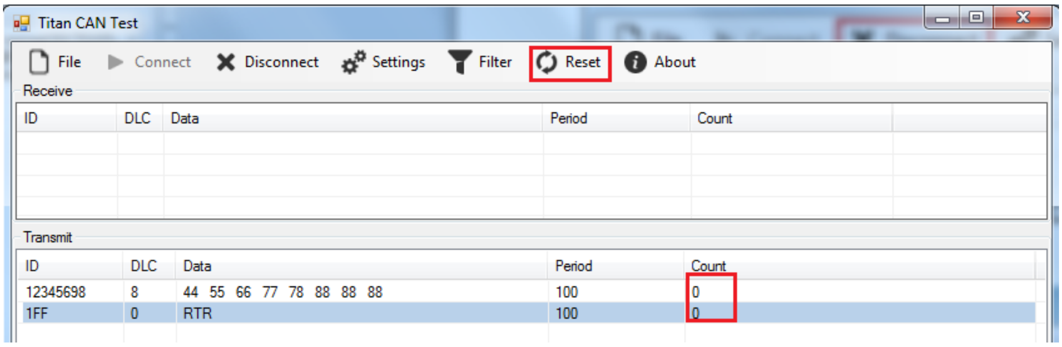
End ID 01FFFFFF

Discrete IDs 01000000

☑ Enable Range Filter

Discrete IDs Filter example: After setting "Start ID" to 00000000, "End ID" to 01FFFFFF and setting "Discrete IDs" to 01000000; The CAN ID range 0x00000000 through 0x01FFFFFF will be passed but only CAN ID 0x01000000 will be blocked.

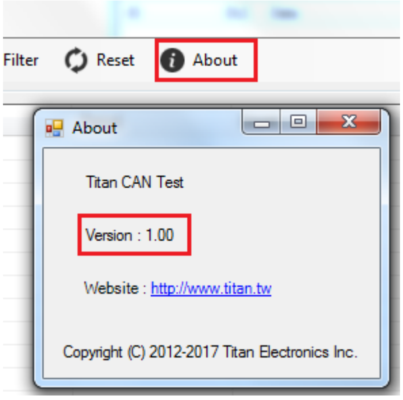
Click "**Reset**" option to renew the received CAN frame message and reset the transmitted (received) count.



ID	DLC	Data	Period	Count

ID	DLC	Data	Period	Count
12345698	8	44 55 66 77 78 88 88 88	100	0
1FF	0	RTR	100	0

Click “**About**” option to show the version information of Titan CAN test program.



Titan CAN Test

Version : 1.00

Website : http://www.titan.tw

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11.3 CANopen

CANopen is a CAN-based communication system. It comprises higher-layer protocols and profile specifications. CANopen has been developed as a standardized embedded network with highly flexible configuration capabilities. It was designed originally for motion-oriented machine control systems, such as handling systems. Today it is used in various application fields, such as medical equipment, off-road vehicles, maritime electronics, railway applications, or building automation.

CanFestival project is an open source CANopen multi-platform framework. (http://www.canfestival.org/) CanFestival focuses on providing an ANSI-C platform independent CANopen stack that can be implemented as master or slave nodes on PCs, Real-time IPCs, and Microcontrollers.

For detailed information about using CanFestival in your project see the "The CanFestival CANopen stack manual".

How to get CanFestival

You can get the CanFestival source code from repository. Then get TITAN CAN driver for CanFestival. Or you can download the code with TITAN driver from TITAN web site.

Linux Compilation and installation

Linux target is default configure target.
Call./configure -help to see all available compile time options.
After invoking ./configure with your platform specific switches, just type make.

```
./configure –can=titan
make
make install
```

Windows Compilation

CanFestival can be compiled and run on Windows platform. It is possible to use both Cygwin and win32 native runtime environment.

Minimal Cygwin installation is required at configuration time to create specific header files (config.h and cancfg.h). Once these files created, Cygwin is not necessary anymore. Project and solution files have been created and tested with Visual Studio Express 2005. Be sure to have installed Microsoft Platform SDK, as recommended at the end of Visual Studio installation.

Cygwin must be installed with those packages:

1. gcc
2. unzip
3. wget
4. make

Extract CanFestival source code into your Cygwin home. Then configure CanFestival.

```
cd CanFestival
./configure --can=titan
Make
```

Compilation with Visual Studio

You can either load independent “*.vcproj” project’ files along your own pro jects in your own solution or load the provided “CanFestival-3.vc8.sln” solution files directly. Build CanFestival-3 project first.

The “examples” directory contains some test program you can use as example you’re your own developments.

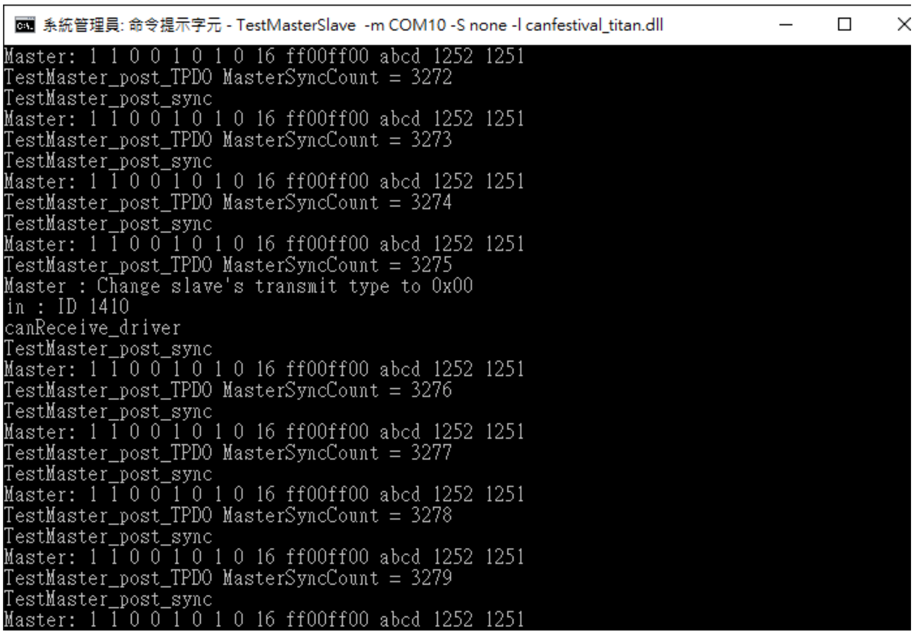
You'll find an example on the supplied CD showing the communication between master and slave nodes. Following baudrates are supported: 20K, 50K, 100K, 125K, 250K, 500K and 1M.

- CanFestival_example_win_x86.zip For Windows 32 bit
- CanFestival_example_win_x64.zip For Windows 64 bit
- CanFestival_example_linux_x86.tar.gz For Linux 32 bit
- CanFestival_example_linux_x64.tar.gz For Linux 64 bit

Under Windows connect two CAN devices, installed as COM3 and COM4. Open two command windows and change to the directory where examples were extracted to and execute
TestMasterSlave -s COM3 -S 125K -M none -l canfestival_titan.dll
in the first command window and
TestMasterSlave -m COM4 -M 125K -S none -l canfestival_titan.dll
in the second.

Following pictures shows the output messages of both nodes.

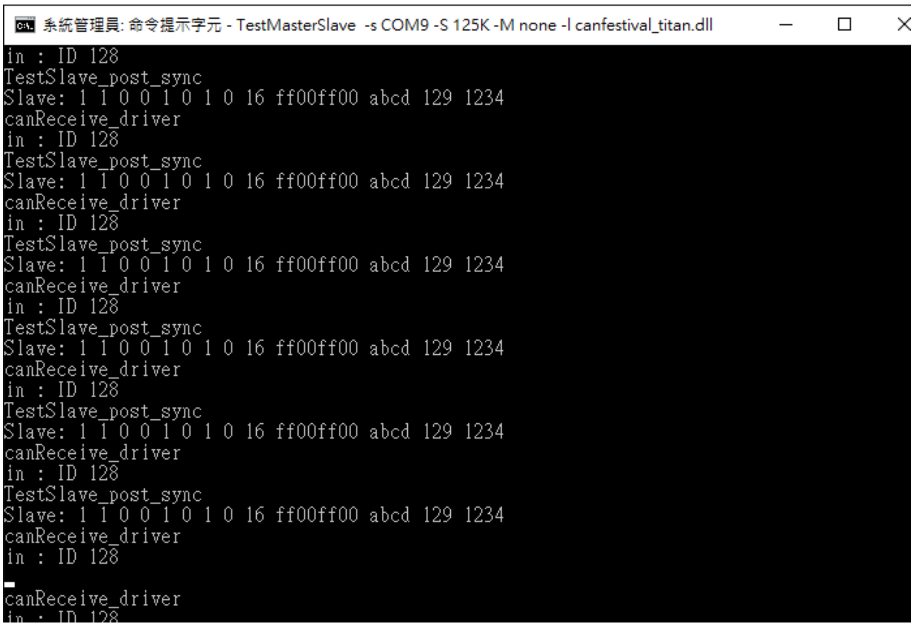
Master:



系統管理員: 命令提示字元 - TestMasterSlave -m COM10 -S none -l canfestival_titan.dll

```
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3272
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3273
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3274
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3275
Master : Change slave's transmit type to 0x00
in : ID 1410
canReceive_driver
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3276
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3277
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3278
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
TestMaster_post_TPDO MasterSyncCount = 3279
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 1252 1251
```

Slave:



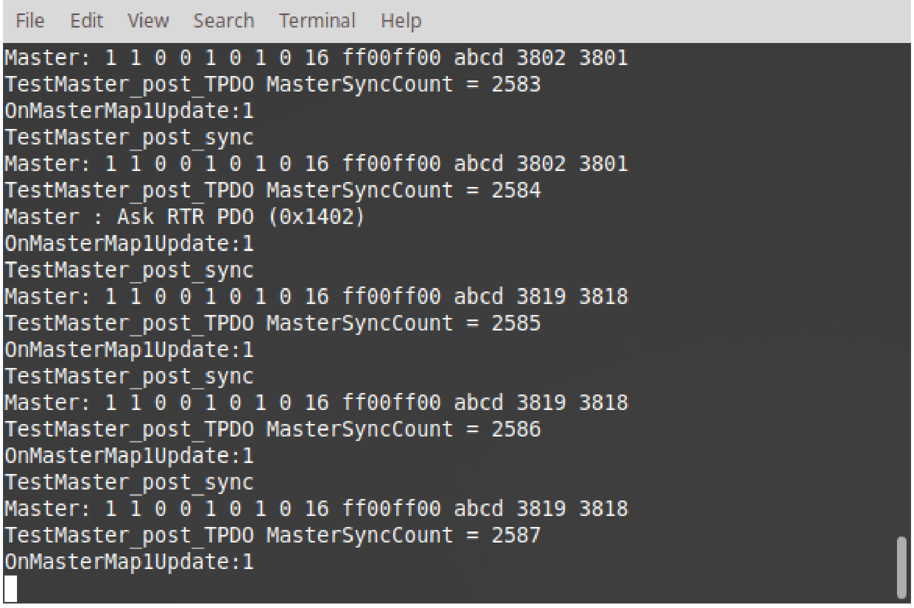
系統管理員: 命令提示字元 - TestMasterSlave -s COM9 -S 125K -M none -l canfestival_titan.dll

```
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 1234
canReceive_driver
in : ID 128

canReceive_driver
in : ID 128
```

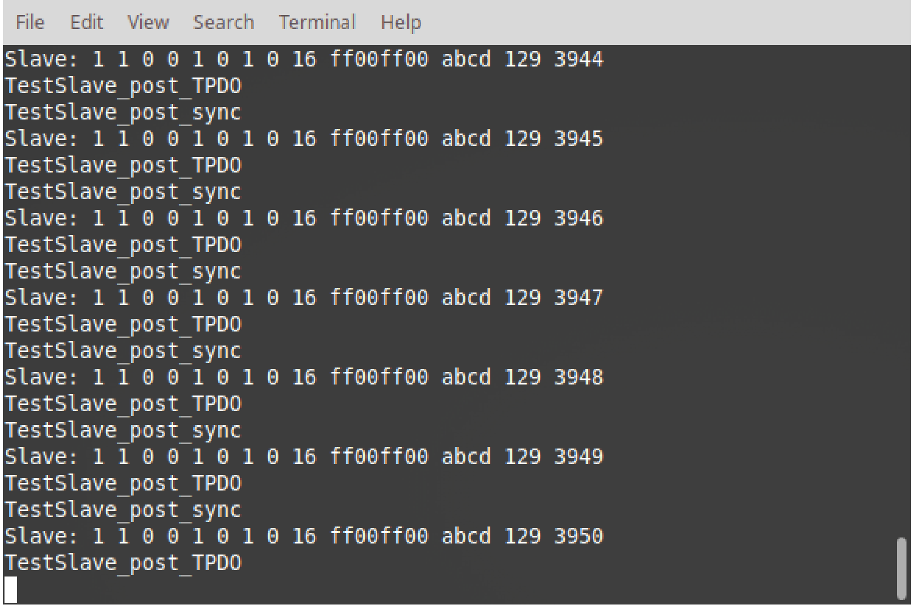
Under Linux connect two CAN devices, installed as /dev/ttyUSB0 and /dev/ttyUSB1. Open two terminal windows and change to the directory where examples were extracted to and execute
export LD_LIBRARY_PATH=.
./TestMasterSlave -s “/dev/ttyUSB0” -S 125K -M none -l ./libcanfestival_can_titan.so
in the first terminal window and
export LD_LIBRARY_PATH=.
./TestMasterSlave -m “/dev/ttyUSB1” -M 125K -S none- ./libcanfestival_can_titan.so
in the second.

Following pictures shows the output messages of both nodes.
Master:



```
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 3802 3801
TestMaster_post_TPDO MasterSyncCount = 2583
OnMasterMap1Update:1
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 3802 3801
TestMaster_post_TPDO MasterSyncCount = 2584
Master : Ask RTR PDO (0x1402)
OnMasterMap1Update:1
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 3819 3818
TestMaster_post_TPDO MasterSyncCount = 2585
OnMasterMap1Update:1
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 3819 3818
TestMaster_post_TPDO MasterSyncCount = 2586
OnMasterMap1Update:1
TestMaster_post_sync
Master: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 3819 3818
TestMaster_post_TPDO MasterSyncCount = 2587
OnMasterMap1Update:1
```

Slave:



```
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3944
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3945
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3946
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3947
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3948
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3949
TestSlave_post_TPDO
TestSlave_post_sync
Slave: 1 1 0 0 1 0 1 0 16 ff00ff00 abcd 129 3950
TestSlave_post_TPDO
```

11.4 python-can

The python-can library provides Controller Area Network support for Python, providing common abstractions to different hardware devices, and a suite of utilities for sending and receiving messages on a CAN bus.

More information you can find in:
https://python-can.readthedocs.io/en/master/

USB-2CAN-M is compatible to slcan-interfaces (slcan ASCII protocol)
https://python-can.readthedocs.io/en/master/interfaces/slcan.html

11.5 APPLICATION PROGRAMMING INTERFACE

The Application Programming Interface (API) gives the user tools to use all of the functions that the CAN adapter provides. It will make it much easier for users to build their own CAN controlling software with these functions, than to implement their application command by command on the ASCII protocol.

Users can use Windows-based API for use with high-level languages. Please refer to the following website for our GUI, sample codes and updates:

https://www.titan.tw/drivers/can-api.html

11.5.1 CAN_Open

CAN_Open(ComPort, szBitrate, acceptance_code, acceptance_mask, flags, Mode)

Function:
Opens a channel to the device.

Parameters:

- ComPort
  - Type: String
  - The COM port to be opened.
  - Format: “COMXXX”
  - Example: “COM1, “COM57”, “COM118”

- szBitrate
  - Type: String
  - The bitrate to operate at. Can be one of the standard bitrates or a user-defined non-standard bitrate.
  - Format:
    - 10 = 10Kbps
    - 20 = 20Kbps
    - 50 = 50Kbps
    - 100 = 100Kbps
    - 125 = 125Kbps
    - 250 = 250Kbps
    - 500 = 500Kbps
    - 800 = 800Kbps
    - 1000 = 1000Kbps
    - XXXXXXXXX, non-standard bitrate
  - Example: “50”, “1000”, “000000150”

- acceptance_code
  - Type: String
  - Used in conjunction with the acceptance mask to filter CAN messages. Set to “00000000” for NULL to allow all messages. Also referred to as acceptance filter in other parts of the manual.
  - Format: “XXXXXXXX”
  - Example: “00000700”

- acceptance_mask
  - Type: String
  - Used in conjunction with the acceptance code to filter CAN messages. Set to “00000000” for NULL to allow all messages.
  - Format: “XXXXXXXX”
  - Example: “000001FF”

- flags
  - Type: IntPtr

  - Determines whether or not the timestamp function should be enabled.
  - Format:
    - 1 = Timestamp will be enabled
    - 0 = Timestamp will be disabled
  - Example: 1

- Mode
  - Type: Integer
  - Determines the mode the USB CAN should operate at.
  - Format:
    - 0 = Normal, the device will operate under normal circumstances
    - 1 = Listen only, the device will passively receive CAN messages
    - 2 = Loopback, the device will also receive messages it transmits
  - Example: 2

- Return value:
  - Type: Integer
  - Handle to the device.
  - Result:
    - > 0, CAN_Open is successful
    - -1, error communicating with COM port
    - -2, error in opening channel, COM port may be already in use
    - -3, error in parameter settings
  - Example: 2508

Sample Command:
CAN_Open("COM3", "50", "00000000", "00000000", 1, 2)
Opens a channel to COM3 at 50kbps, with all messages allowed, timestamp enabled and operating in loopback mode.

11.5.2 CAN_Close

CAN_Close(Handle)

Function:
Closes the channel with the specified handle.

Parameters:

- Handle
    - Type: Integer
    - The handle of the CAN channel to be closed.
    - Format: A numeric value provided by the return value of CAN_Open
    - Example: 2508

- Return value:
    - Type: Integer
    - Code indicating result of CAN_Close.
    - Result:
        - 1, CAN_Close is successful
        - -1, error communicating with COM port
        - -4, error: CAN channel is not open

Sample Command:
CAN_Close(2508)
Closes device connected to channel with the handle 2508.

11.5.3 CAN_Write

CAN_Write(Handle, Buf)

Function:
Writes a message to the channel with the specified handle.

Parameters:

- Handle
  - Type: Integer
  - The handle of the CAN channel to write to.
  - Format: A numeric value provided by the return value of CAN_Open
  - Example: 2508

- Buf[1]
  - Type: CAN_MSG structure
  - The standard structure of CAN frame messages.
  - Format: Name of an instance of the CAN_MSG structure
  - Example: myCANMsg

- Return value:
  - Type: Integer
  - Code indicating result of CAN_Write.
  - Result:
    - 1, CAN_Write is successful
    - -1, error communicating with COM port
    - -4, error: CAN channel is not open

Sample Command:
CAN_Write(2508, myCANMsg)
Writes the message contained in myCANMsg to device connected to channel with the handle 2508.

[1] Refer to the "CAN_MSG Structure" section for more information

11.5.4 CAN_Read

CAN_Read(Handle, Buf)

Function:
Reads a message from the channel with the specified handle.

Parameters:

- Handle
  - Type: Integer
  - The handle of the CAN channel to read from.
  - Format: A numeric value provided by the return value of CAN_Open
  - Example: 2508

- Buf[2]
  - Type: CAN_MSG structure
  - The standard structure of CAN frame messages.
  - Format: Name of an instance of the CAN_MSG structure
  - Example: myCANMsg

- Return value:
  - Type: Integer
  - Code indicating result of CAN_Read.
  - Result:
    - 1, CAN_Read is successful
    - -1, error communicating with COM port
    - -4, error: CAN channel is not open
    - -5, error: there are no messages

Sample Command:
CAN_Read(2508, myCANMsg)
Reads the message from device connected to channel with the handle 2508 and stores it into myCANMsg.

[2] Refer to the "CAN_MSG Structure" section for more information

11.5.5 CAN_Flush

CAN_Flush(Handle)

Function:
Clears the buffers of the channel with the specified handle.

Parameters:

- Handle
  - Type: Integer
  - The handle of the CAN channel whose buffers are to be cleared.
  - Format: A numeric value provided by the return value of CAN_Open
  - Example: 2508

- Return value:
  - Type: Integer
  - Code indicating result of CAN_Flush.
  - Result:
    - 1, CAN_Flush is successful
    - -1, error communicating with COM port
    - -4, error: CAN channel is not open

Sample Command:
CAN_Flush(2508)
Clears the buffers of device connected to channel with the handle 2508.

11.5.6 CAN_Status

CAN_Status(Handle)

Function:
Checks the status bits for more specific details when an error occurs.

Parameters:

- Handle
    - Type: Integer
    - The handle of the CAN channel whose status bits are to be inquired.
    - Format: A numeric value provided by the return value of CAN_Open
    - Example: 2508

- Return value:
    - Type: Integer
    - Code indicating result of CAN_Status.
    - Result:
        - Bit [2, 1, 0]
            - 0, 0, 0: no error
            - 0, 0, 1: stuff error
            - 0, 1, 0: form error
            - 0, 1, 1: ACK error
            - 1, 0, 0: Bit1Error
            - 1, 0, 1: Bit0Error
            - 1, 1, 0: CRCError
            - 1, 1, 1: unused
        - Bit [3]
            - 1: message successfully transmitted
            - 0: no message has been transmitted
        - Bit [4]
            - 1: message successfully received
            - 0: no message has been received
        - Bit [5]
            - 1: CAN core is in error passive state
            - 0: CAN core is in error active state
        - Bit [6]
            - 1: at least one error counter in EML has reached the warning limit of 96
            - 0: both error counters are below the warning limit of 96
        - Bit [7]
            - 1: CAN module is in bus-off state
            - 0: CAN module is not in bus-off state
        - <BELL> = ERROR

Sample Command:
CAN_Status(2508)

Checks the status bits of device connected to channel with the handle 2508.

11.5.7 CAN_Version

CAN_Version(Handle, buf)

Function:
Retrieves the firmware version of the device connected to channel with the specified handle.

Parameters:

- Handle
  - Type: Integer
  - The handle of the CAN channel whose version information is to be inquired.
  - Format: A numeric value provided by the return value of CAN_Open
  - Example: 2508

- buf
  - Type: Character array/string
  - Information about the firmware version will be stored into this array.
  - Format: Name of a character array
  - Example: myVersion

- Return value:
  - Type: Integer
  - Code indicating result of CAN_Version.
  - Result:
    - 1, CAN_Version is successful
    - -1, error communicating with COM port
    - -4, error: CAN channel is not open

Sample Command:
CAN_Version(2508)
Retrieves the firmware version of device connected to channel with the handle 2508.

CAN_MSG Structure

- Members:
  - Id
    - Type: Unsigned Integer
    - Message ID.
    - Format: XXX (standard), XXXXXXXX (extended)
    - Example: 1FF
  - Size
    - Type: Byte
    - Message size.
    - Format: A numeric value from 0~8
    - Example: 8
  - Data
    - Type: Byte array with 8 elements
    - Content of the data to be sent/received.
    - Format: XX
    - Example: 11
  - Flags
    - Type: Byte
    - Determines the message ID type and timestamp settings.
    - Format:
      - 1, timestamp off, standard
      - 2, timestamp off, extended
      - 9, timestamp on, standard
      - 10, timestamp on, extended
    - Example: 9
  - Timestamp
    - Type: Unsigned Short
    - Value of the timestamp.
    - Format: No input from the user is required
    - Example: 0

- Sample Message:
  - With a CAN_MSG structure instance declared as myCANMSG:
    - myCANMsg.ID = 1FF
    - myCANMsg.Size = 3
    - myCANMsg.Data(0) = 11
    - myCANMsg.Data(1) = 22
    - myCANMsg.Data(2) = 33
    - myCANMsg.Flags = 10

Example Code for C

```
#include <stdio.h>
#include <stdlib.h>
#include "CAN_API.h"

int main() {
   TCAN_HANDLE Handle;
   TCAN_STATUS Status;
   CHAR *ComPort = "COM23";
   CHAR *szBitrate = "800";
   CHAR *acceptance_code = "1FFFFFFF";
   CHAR *acceptance_mask = "00000000";
   VOID *flags = CAN_TIMESTAMP_OFF;
   DWORD Mode = LoopBack;

   char version[10];
   CAN_MSG SendMSG;
   CAN_MSG RecvMSG;
   Handle = -1;
   Status = 0;

   SendMSG.Flags = CAN_FLAGS_EXTENDED;
   SendMSG.Id = 0x12345678;
   SendMSG.Size = 8;
   SendMSG.Data[0] = 0x11;
   SendMSG.Data[1] = 0x22;
   SendMSG.Data[2] = 0x33;
   SendMSG.Data[3] = 0x44;
   SendMSG.Data[4] = 0x55;
   SendMSG.Data[5] = 0x66;
   SendMSG.Data[6] = 0x77;
   SendMSG.Data[7] = 0x88;

   Handle = CAN_Open ( ComPort, szBitrate, acceptance_code,
acceptance_mask, flags, Mode );

   printf ( "handle= %d\n", Handle );
   if ( Handle < 0 ) {
      return 0;
   }

   memset ( version, 0, sizeof ( char ) * 10 );
   Status = CAN_Flush ( Handle );
   Status = CAN_Version ( Handle, version );

   if ( Status == CAN_ERR_OK ) {
      printf ( "Version : %s\n", version );
   }
   Status = CAN_Write ( Handle, &SendMSG );
   if ( Status == CAN_ERR_OK ) {
      printf ( "Write Success\n" );
   }

   while ( 1 ) {
      Status = CAN_Read ( Handle, &RecvMSG );
      if ( Status == CAN_ERR_OK ) {
         printf ( "Read ID=0x%X, Type=%s, DLC=%d, FrameType=%s,
Data=",
         RecvMSG.Id,( RecvMSG.Flags & CAN_FLAGS_STANDARD ) ?
"STD" : "EXT",
         RecvMSG.Size,( RecvMSG.Flags & CAN_FLAGS_REMOTE ) ?
"REMOTE" : "DATA"  );

            for ( int i = 0; i < RecvMSG.Size; i++ ) {
            printf ( "%X,", RecvMSG.Data[i] );
         }
         break;
      }
   }

   Status = CAN_Close ( Handle );
   printf ( "Test finish\n" );
   return 0;
}
```

11.6 Using the API in C#

1. Ensure that the DLL file is placed in the same folder as your application executable.

2. Import the functions you need from the DLL into your source code with the Declare statement:

```
[DllImport("can_api.dll", EntryPoint = "CAN_Open", CallingConvention =
CallingConvention.Cdecl)]
    static extern Int32 CAN_Open(string SerialNrORComPortORNet, string szBitrate,
string acceptance_code, string acceptance_mask, Int32 flags, UInt32 Mode);
```

3. Create a definition of the CAN_MSG structure for the CAN_Write and CAN_Read functions, if needed.

```
public struct CAN_MSG
  {
public UInt32 Id;
public byte Size;
[MarshalAs(UnmanagedType.ByValArray, SizeConst = 8)]
public byte[] Data;
public byte Flags;
public UInt16 TimeStamp;
}
```

The keyword MarshalAs is used for all structure members to ensure that the structure size corresponds to what the DLL expects.

4. In order to communicate with the channel with other functions after opening it with CAN_Open, you need to create a variable to store the handle value.

```
Int myHandle;
myHandle = CAN_Open(("COM3", "50", "00000000", "00000000", 1, 2);
```

5. This concludes the basic setup process of using the DLL in C#. Imported functions can then be easily called from the DLL with the parameters created above.

11.7 Using the API in Visual Basic .NET

6. Ensure that the DLL file is placed in the same folder as your application executable.

7. Import the functions you need from the DLL into your source code with the Declare statement:

```
Private Declare Function CAN_Open Lib "CANDLL_STDCALL.dll" (ByVal ComPort As String, ByVal szBitrate As String, ByVal acceptance_code As String, ByVal acceptance_mask As String, ByRef Flags As IntPtr, ByVal Mode As Integer) As Integer
```

8. Create a definition of the CAN_MSG structure for the CAN_Write and CAN_Read functions, if needed.

```
Imports System.Runtime.InteropServices

Public Structure CAN_MSG
  <MarshalAs(UnmanagedType.U4)>
  Public Id As UInteger
  <MarshalAs(UnmanagedType.U1)>
  Public Size As Byte
  <MarshalAs(UnmanagedType.ByValArray, SizeConst:=8, ArraySubType:=UnmanagedType.U1)>
  Public Data As Byte()
  <MarshalAs(UnmanagedType.U1)>
  Public Flags As Byte
  <MarshalAs(UnmanagedType.U2)>
  Public Timestamp As UShort
End Structure
```

The keyword MarshalAs is used for all structure members to ensure that the structure size corresponds to what the DLL expects.

To use the CAN_MSG structure, you will need to create an instance of the structure you just defined.

```
Private myCANMSG As CAN_MSG
```

Before accessing this instance you just created for the first time, set the size for the Data member to avoid “array out of bounds” error. This can be done in your program’s constructor.

```
ReDim myCANMSG(7)
```

9. In order to communicate with the channel with other functions after opening it with CAN_Open, you need to create a variable to store the handle value.

```
Private myHandle As Integer
myHandle = CAN_Open(("COM3", "50", "00000000", "00000000", 1, 2)
```

10. This concludes the basic setup process of using the DLL in Visual Basic .NET. Imported functions can then be easily called from the DLL with the parameters created above.

11.8 Using the API in Visual Basic 6.0

1. Ensure that the DLL file is placed in the same folder as your application executable.

2. Import the functions you need from the DLL into your source code with the Declare statement:

```
Private Declare Function CAN_Open Lib "CANDLL_STDCALL.dll" (ByVal ComPort As
String, ByVal szBitrate As String, ByVal acceptance_code As String, ByVal
acceptance_mask As String, ByRef Flags As Long, ByVal Mode As Long) As Long
```

3. Create a definition of the CAN_MSG structure for the CAN_Write and CAN_Read functions, if needed.

```
Private Type CAN_MSG
  Id As Long
  Size As Byte
  Data(0 To 7) As Byte
  Flags As Byte
  Timestamp As Integer
End Type
```

To use the CAN_MSG structure, you will need to create an instance of the structure you just defined.

```
Private myCANMSG As CAN_MSG
```

4. In order to communicate with the channel with other functions after opening it with CAN_Open, you need to create a variable to store the handle value.

```
Private myHandle As Long
myHandle = CAN_Open(("COM3", "50", "00000000", "00000000", 1, 2)
```

5. This concludes the basic setup process of using the DLL in Visual Basic 6.0. Imported functions can then be easily called form the DLL with the parameters created above.

11.9 Using the API in Python

6. Ensure that the DLL file is placed in the same folder as your application executable.

7. Import the DLL using the ctypes library function LoadLibrary.

```
from ctypes import windll

DLL = windll.LoadLibrary("CANDLL_STDCALL.dll")
```

8. Create a definition of the CAN_MSG structure for the CAN_Write and CAN_Read functions, if needed.

```
from ctypes import Structure, c_uint, c_ubyte, c_ushort

class CAN_MSG(Structure):
   _fields_ =  [("Id", c_uint),
              ("Size", c_ubyte),
              ("Data", c_ubyte * 8 ),
              ("Flags", c_ubyte),
              ("Timestamp", c_ushort)]
```

To use the CAN_MSG structure, you will need to create an instance of the structure you just defined.

```
myCANMSG = CAN_MSG()
```

9. In order to communicate with the channel with other functions after opening it with CAN_Open, you need to create a variable to store the handle value.

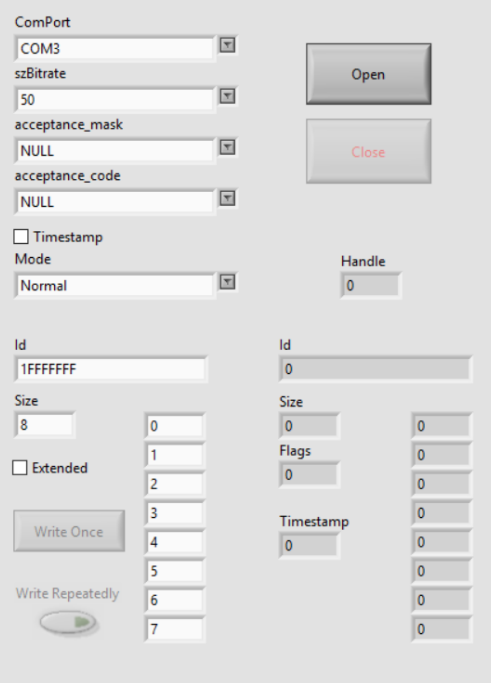
```
myHandle = DLL.CAN_Open(b"COM3", b"50", b"00000000", b"00000000", 1, 2)
```

10. This concludes the basic setup process of using the DLL in Python. Imported functions can then be easily called form the DLL with the parameters created above.

11.10 Using the API in LabVIEW

11.10.1 CAN_Main.vi

The main panel is a simple, easy-to-use example program which contains most of the important functions available for use in the CAN API. Different functions can be tested by changing the settings on the leftmost side, which are restricted to legal parameters to prevent an error in operation. For example, the user can choose from Normal, Listen Only, or Loopback mode to suit their purposes.



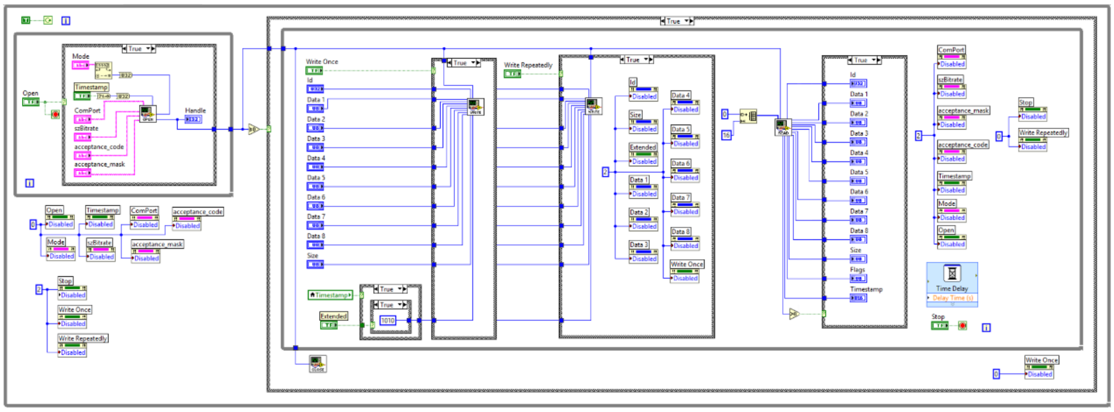
ComPort: COM3
szBitrate: 50
acceptance_mask: NULL
acceptance_code: NULL
□ Timestamp
Mode: Normal
Handle: 0

Id: 1FFFFFFF
Size: 8
□ Extended
0
1
2
3
4
5
6
7

Id: 0
Size: 0
Flags: 0
Timestamp: 0
0
0
0
0
0
0
0
0

Once the channel is opened, the user can use either “Write Once” or the “Write Repeatedly” button to send messages as configured in the fields. Messages received will appear on the fields on the rightmost side, if they are available.

All subVI icons have been customized, with the terminals wired to be user-friendly, increase readability and allow for cleanliness in larger projects, as seen in the block diagram for the main panel.



11.10.2 CAN_Open.vi

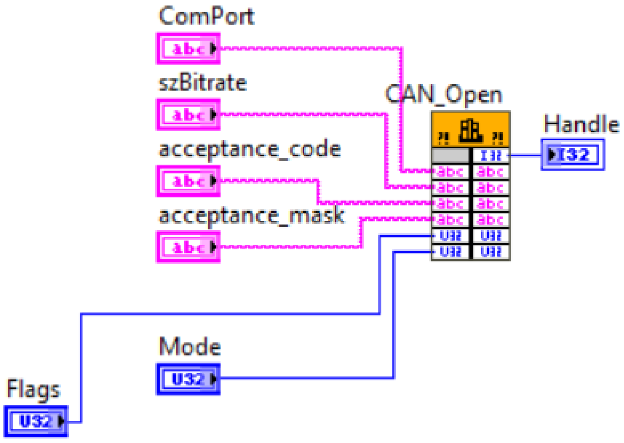
Description
Opens a channel to the device.

Input

- ComPort: The COM port to establish a connection with.
- szBitrate: The speed at which the connection is to be made, with preset values of 10, 20, 50, 100, 125, 250, 500, 800, 100
- acceptance_code: Used for filtering CAN messages. To be used with the acceptance mask.
- acceptance_mask: Used for filtering CAN messages. To be used with the acceptance code.
- Flags: Whether or not the timestamp function should be enabled.
- Mode: The mode at which the device should operate at, with choices being Normal, Listen Only and Loopback

Output

- Return: Handle to the device. A positive value indicates success in opening the channel, while -2 represents error when opening channel and -3 represents error in input parameters



11.10.3 CAN_Close.vi

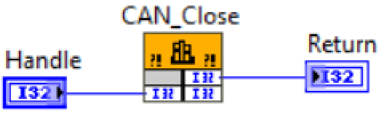
Description
Closes the CAN channel with the specified handle.

Input

- Handle: The handle of the CAN channel which is to be closed

Output

- Return: A positive value indicates success in closing the channel, whereas a negative value indicates an error in closing the channel.



11.10.4 CAN_Write.vi

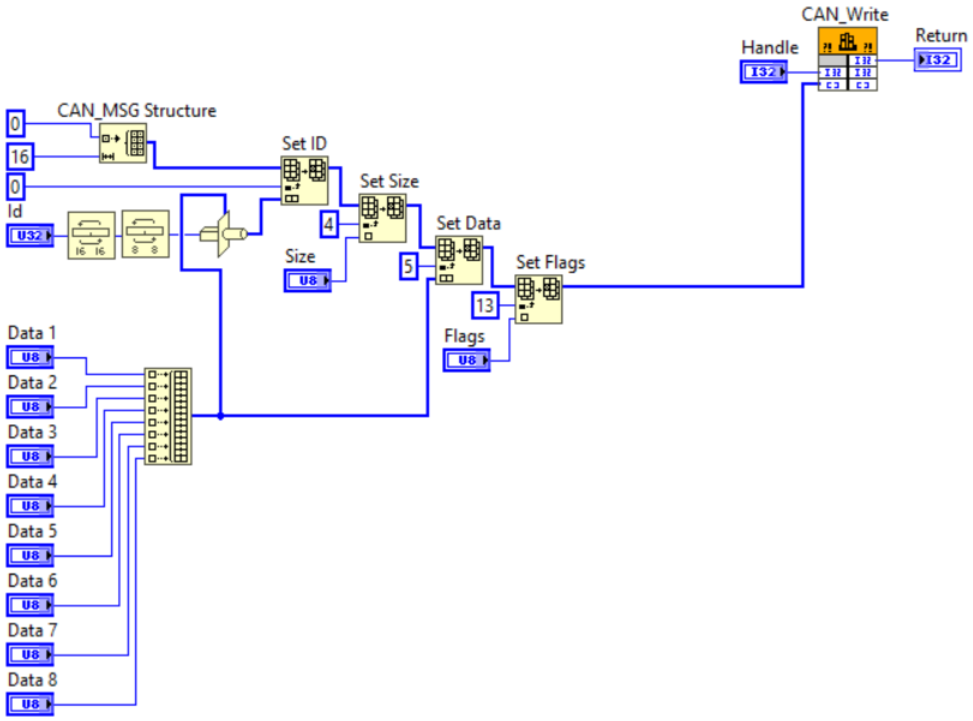
Description
Writes a message to the CAN channel with the specified handle.

Input

- Handle: The handle of the CAN channel which the message is to be sent to.
- Id: Message ID.
- Size: Frame size (0~8).
- Data[8]: Data bytes 0~7.
- Flags: 1 (standard), 2 (extended), 9 (standard + timestamp), 10 (extended + timestamp)
- Timestamp: Timestamp (ms)

Output

- Return: A positive value indicates success in sending the message, whereas a negative value indicates an error in sending the message, with -4 representing that the channel is not open.



11.10.5 CAN_Read.vi

Description
Read a message from the CAN channel with the specified handle.

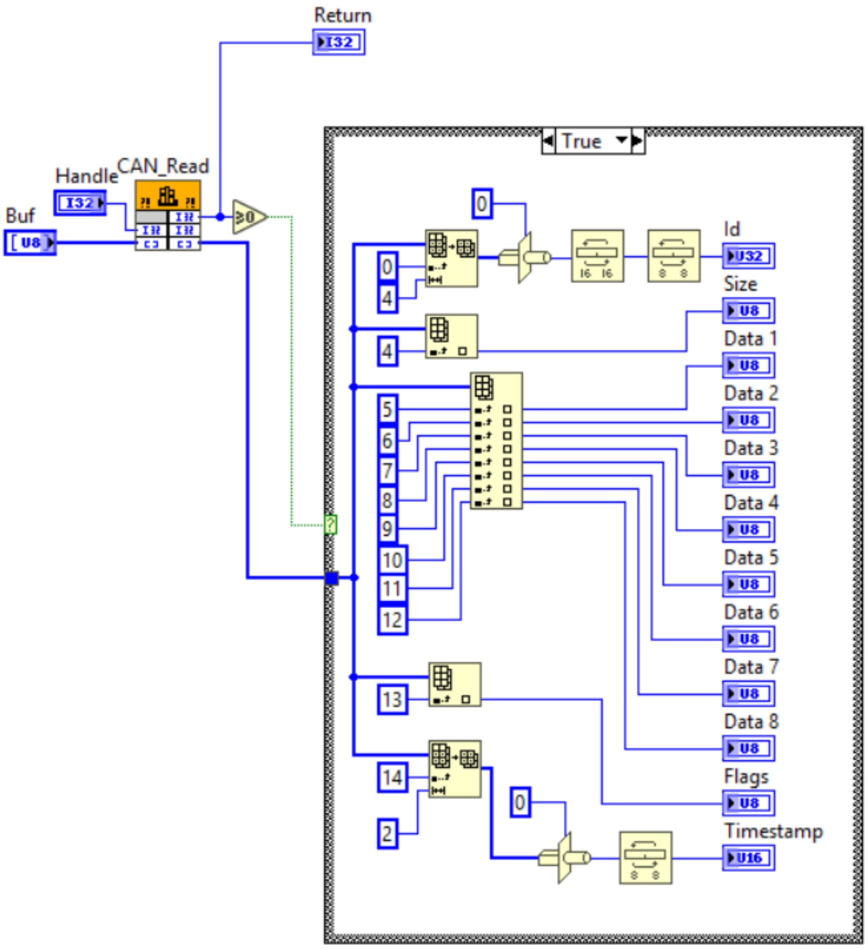
Input

- Handle: The handle of the CAN channel which the message is to be read from.

Output

- Return: A positive value indicates success in reading the message, whereas a negative value indicates an error in reading the message, with -4 representing that the channel is not open and -5 representing that there is no message to be read.
- Id: Message ID.
- Size: Frame size (0~8).
- Data[8]: Data bytes 0~7.
- Flags: 1 (standard), 2 (extended), 9 (standard + timestamp), 10 (extended + timestamp)

Timestamp: Timestamp (ms).


Return
I32
Handle
CAN_Read
Buf
I32
U8
≥0
True
0
0
4
4
5
6
7
8
9
10
11
12
13
14
2
0
Id
U32
Size
U8
Data 1
U8
Data 2
U8
Data 3
U8
Data 4
U8
Data 5
U8
Data 6
U8
Data 7
U8
Data 8
U8
Flags
U8
Timestamp
U16

Notes

This product requires external power source to function. If the power LED is not illuminating after connecting, check that the power source is connected to the hub correctly, and is powered on.

Safety

- Read the entire Product Manual before implementing this product for your application. This manual contains important information about electrical connections that must be followed for safe and proper operation.
- Inspect the product closely for visual defects before putting it to use.
- Keep away from areas where moisture builds, this product contains electrical components that can be damaged by moisture build up, this can adversely affect your equipment connected to it.
- Do not disassemble the product. Handling the product's internal components can expose it to ESD (Electro-Static Discharge) hazards that can affect the function of the device.
- If this product is not functioning properly, email our support team at support@coolgear.com.

USB CHARGING & CONNECTIVITY EXPERTS

Within Every Great Machine

For over 20 years our rugged, off-the-shelf USB hubs, chargers, and serial products are ready to go for your next project. Based in the US, Coolgear has successfully engineered and deployed millions of connectivity solutions into industrial, medical, automotive, commercial, and aerospace industries.

We understand the importance of reliability, build quality, & consider all our customers' applications as critical wanting to ensure long-lasting event-free integrations.

Compliance Statement

View compliance within the product's respective Technical Data Sheet, found on the product's online listing.

Technical Support

When you reach out to Coolgear support, you'll find yourself in the hands of a solution-oriented and knowledgeable expert ready to answer whatever question you throw at them. If you ever need help with your product, visit coolgear.com/support for support tickets, downloads, and other support resources. For the latest drivers, please visit coolgear.com/download.

Product Standard Warranty

One (1) Year Warranty from Date of Purchase Invoice. Coolgear will repair or replace any Product determined to be defective and which has been returned, at your risk and expense, to Coolgear. Where Coolgear determines in its sole judgment that repair or replacement of such Product is not reasonable, Coolgear will keep the non-conforming Product and refund to you the amount you paid for such Product. Returned Products shall be subject to the balance of the Warranty Period otherwise applicable. Any reconditioned parts used by Coolgear shall be subject to all the same provisions as otherwise applicable to new parts. THE FOREGOING DESCRIBES COOLGEAR'S SOLE LIABILITY, AND YOUR SOLE REMEDY, FOR ANY BREACH OF WARRANTY. IF YOU DO NOT AGREE WITH THE TERMS OF THIS LIMITED WARRANTY, YOU MUST RETURN THE PRODUCTS UNUSED AND IN THEIR ORIGINAL CONTAINERS TO YOUR ORIGIN OF PURCHASE.

Limitation of Liability

This Limited Warranty does not cover: (i) defects or damages resulting from natural causes, casualty, accident, misuse or abuse, neglect, alterations, service or repair by other than Coolgear, including without limitation by you; (ii) improper installation or de-installation, operation or maintenance, improper connections with peripherals or other causes not arising out of defects in the materials or workmanship of Products; (iii) any Product for which the warranty sticker has been removed, modified or defaced; (iv) normal wear and tear; (v) damage to or loss of repaired or replaced Products during shipping by Coolgear except when such damage or loss is caused by poor or inadequate packaging by Coolgear; or (vi) Products purchased outside the United States. UNDER NO CIRCUMSTANCES WILL COOLGEAR BE LIABLE FOR ANY LOSS OF USE, INTERRUPTION OF BUSINESS OR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY KIND (INCLUDING LOST PROFITS) REGARDLESS OF THE FORM OF ACTION WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT PRODUCT LIABILITY OR OTHERWISE, EVEN IF COOLGEAR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE TOTAL LIABILITY OF COOLGEAR HEREUNDER EXCEED THE GREATER OF $50.00 OR THE AMOUNT YOU ACTUALLY PAID FOR THE PRODUCT GIVING RISE TO SUCH LIABILITY, REGARDLESS OF THE CAUSE OF ACTION, IN CONTRACT, TORT, STRICT LIABILITY OR OTHERWISE. NOT ALL JURISDICTIONS ALLOW SUCH LIMITATIONS OF DAMAGES SO THE FOREGOING LIMITATIONS MAY NOT APPLY TO YOU.