



# **QUICK GUIDE CONNECTION**

## **SX2WEB24 CONTROLLER**

# QUICK GUIDE – HOW TO CONNECT TO SX2WEB24 CONTROLLER

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# 2 HOW TO CONNECT TO THE SX2WEB CONTROLLER

To access the Sx2WEB controller, you first need to establish a connection between your PC and the Sx2WEB. Ethernet method is the preferred choice as it supports a reliable, high-speed connection with minimal configuration required. When a network connection is not available (no Router/LAN), several alternatives exist for networking them in this manner, as shown as follows in the table below:

Connection type	Procedure
	Connecting with Dynamic address through a LAN (or VLAN)
	Note: each device has a Dynamic IP address configured and both devices are connected to the same local network
	Connecting with Static IP address through a LAN (or VLAN)
Ethernet cable	Note: the devices are configured with a Dynamic/Static IP address and both are connected to the same local network
Ethernet Cable	Connecting with Secondary Static IP address with an Ethernet cable
	Note: The Static IP address 192.168.253.254 is used to get a direct connection via Ethernet
	Connecting the Sx2WEB and the PC directly with an Ethernet cable
	Note: A Static IP address must be assigned to both devices and they are connected by means a direct connection
Modem dongle	Connect the PC to the Sx2WEB by means of a Modem
Mini-USB cable	Connect to the controller with a mini-USB cable



# 2.1 Equipment requirements

To make a connection with Ethernet, Modem or mini-USB cable requires that:

Connection type	Equipment requirements	PC requirements
Ethernet LAN connection	2x Ethernet cable 1x USB flash drive or SD card	1x Ethernet port
Ethernet Direct connection	1x Ethernet cable 1x USB flash drive or SD card Note: older PC requires a Crossover Ethernet cable	1x USB port 2.0 or higher or SD card reader
Modem connection	1x SH2DSP24 adapter 1x 3G Modem dongle	1x DynDNS account 1x USB port 2.0 or higher or SD card reader
Mini-USB cable	1x USB 2.0 cable-Type-A / Mini-B	1x USB port 2.0 or higher  1x Driver Linux package

# 2.2 System requirements

These are the minimum recommended specifications for a Computer to run the Sx Tool:

Minimum Computer requirements			
	A Microsoft® Windows®-based PC		
Hardware	Display with a resolution capability of minimum 1024x768 pixels		
	1 GB of disk-space		
Coffware	Microsoft® Windows® 10/8.1/8/7/Vista (32 or 64-bit)		
Software	Microsoft Dot-Net Framework 4.5		



# Things to know

## 2.3 Ethernet connection and TCP/IP networking

#### 2.3.1 Power ON the Sx2WEB controller

After a Power ON, the Sx2WEB controller is ready to work after about 1 minute. Only when the yellow BUS Led starts flashing the Sx2WEB is ready. The Sx2WEB is factory-configured to start in DHCP mode.

#### 2.3.2 Network setup and tuning

Ethernet technology offers the most general-purpose solution, allowing networks with more than two computers and Sx2WEB controllers to be built fairly easily later, however, if your PC is running the Windows Firewall or a Third-Party Firewall/Antivirus, make sure that the ports shown in the table below **are not blocked** (input/output packets).

Port number	Protocol	Description	Purpose
10000	TCP	Sx Tool	Connection from Sx Tool to Sx2WEB controller
10001	TCP	Sx Tool	Connection from Sx Tool to Sx2WEB controller
48007	UDP	Discovery	Broadcast protocol to discover the Sx2WEB on the LAN

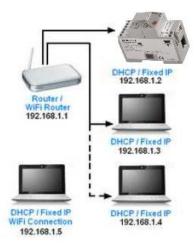
These ports are used by the Sx Tool to search for the Sx2WEB controllers in the network and for communication. If a firewall blocks these ports, the Sx Tool will not be able to find the controllers in the network or to use the Live Signals.



## **Procedures**

## 2.4 Connecting with Dynamic IP address thought a LAN (or VLAN)

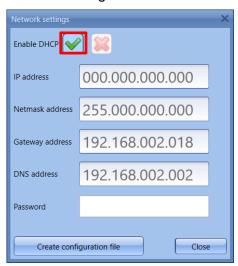
The Sx2WEB controller and the PC are connected directly to a router (or Wi-Fi router). The router has the DHCP server enable inside, so the Sx2WEB must be configured to automatically acquiring a Dynamic IP address from the DHCP server.



You can follow this procedure to set the controller with a Dynamic IP address:

#### Step Action

1 Run the Sx Tool, click on *Program Setup* menu, *IP setup* icon and check Enable DHCP *green V* icon





2	Click on Create configuration file button to Save the file in a USB stick
	Note: The USB drive must be formatted in FAT32 and the file must be saved in the root of the USB stick
3	Plug it into the Sx2WEB's USB port: when the blue LED is lit, the IP settings are changed and you can remove the USB drive
	Note: see Troubleshooting if the Blue LED does not light up
4	See How to get connection with Sx Tool to automatically connect

## 2.5 Connecting with Static IP address thought a LAN (or VLAN)

The Sx2WEB is connected to a local area network with a Static IP address according to the LAN parameters and your PC is connected to the same network with a Dynamic/Static IP address. This scenario is valid when the controller is working with a Static IP. Be sure that the Sx2WEB's IP settings match the IP settings of your PC: they must have the same IP class and the same net mask address.

Follow this procedure to configure the Static IP address for Sx2WEB controller:

Step	Action
1	Run the Sx Tool, click on Program Setup menu and click on IP setup icon

2 Set the following settings (Gateway and DNS are not mandatory, the Sx Tool automatically adds them by obtaining the missing information from the PC settings)





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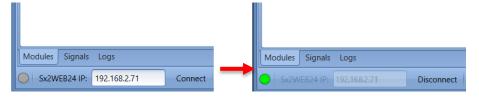
Click on Create configuration file button to Save the file in a USB drive

Note: The USB drive must be formatted in FAT32 and the file must be saved in the root of the USB drive

4 Plug it into the Sx2WEB's USB port: when the blue LED is lit, the IP is changed and you can remove the USB

Note: see Troubleshooting if the Blue LED does not light up

- See <u>How to get connection with Sx Tool</u> to connect automatically or see the next step (5b) for manual connection
- Run the Sx Tool and type in the address bar the IP of the controller. Click Connect



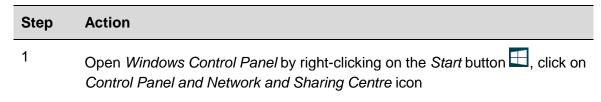
The green small dot confirms the connection has been established



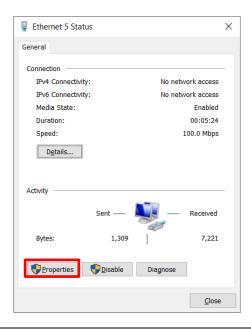
## 2.6 Connecting with Secondary IP address with an Ethernet cable

When there is no mini-USB cable available, there is another way to connect with the Sx2WEB controller. You must make a point to point connection by using the SECONDARY STATIC IP ADDRESS **192.168.253.254** inside the Sx2WEB controller. **NOTE: This address is fixed and cannot be changed.** 

Follow this procedure to manage the connection using this secondary IP address:

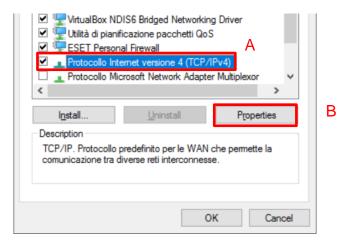


Locate the wired network interface that is physically connected to the Sx2WEB controller via an Ethernet cable. Click on *Properties* 

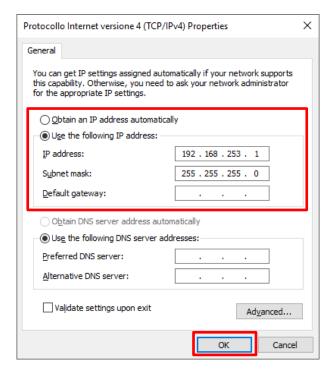




Open the network settings then select TCP/IPVv4 and click on Properties



Set a Static IP address in your PC in the class 192.168.253.xxx, (e.g. IP 192.168.253.1, Subnet mask 255.255.255.0) as shown in the example below:



- 5 Connect the Ethernet cable in the PC and the Sx2WEB Ethernet ports
- Go to the Sx Tool and type the IP 192.168.253.254. Click *Connect*

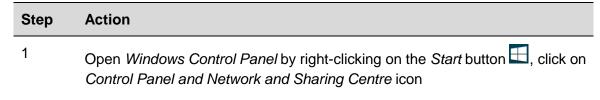




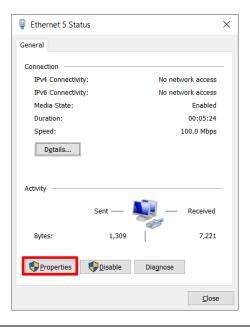
## 2.7 Connecting the Sx2WEB and PC directly with an Ethernet cable

To connect the devices that don't have access to a local area network, or if the router does not have the DHCP server enabled, you can use an Ethernet cable to make a direct connection between the Sx2WEB controller and your PC. The network settings on each device are appropriately configured with a static IP address for PC and controller.

You can use this procedure to configure a Static IP address for Sx2WEB and your PC:



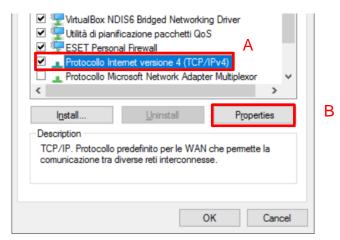
Locate the wired network interface that is physically connected to the Sx2WEB controller via an Ethernet cable. Click on Properties



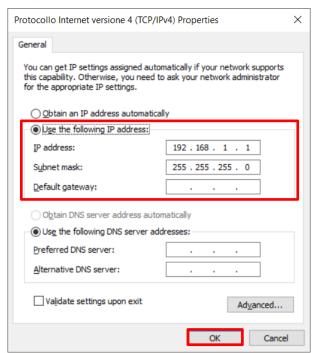


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Open the network settings then select TCP/IPVv4



Check *Use the following IP address*, then enter a Static IP like the one below and press *Confirm* 



5 Close the Network properties, then Control panel to store the changes



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Run Sx Tool, click on *Program Setup* menu, click on *IP setup* icon, and set the following settings (Gateway and DNS are not mandatory)



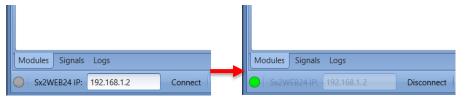
7 Click on Create configuration file button to Save the file in a USB stick

Note: The USB drive must be formatted in FAT32 and the file must be saved in the root of the USB stick

Plug it into the Sx2WEB's USB port: when the blue LED is lit, the IP is changed and you can remove the USB

Note: see Troubleshooting if the Sx2WEB's blue LED does not light up

- Plug each end of the Ethernet cable into an Ethernet network port on the PC and the Sx2WEB to connect they together with the cable.
- Go to the Sx Tool and type the IP of the controller. Then click Connect



The green small dot confirms the right connection



#### 2.7.1 Automatically discovers the Sx2WEBs in the network

To connect to a Sx2WEB you can follow this procedure: The Sx Tool will start the discovery of the Sx2WEBs connected to the Ethernet network.

#### Step Action

Open the Sx Tool and click on the icon *Controllers* to search the Sx2WEBs available in the LAN

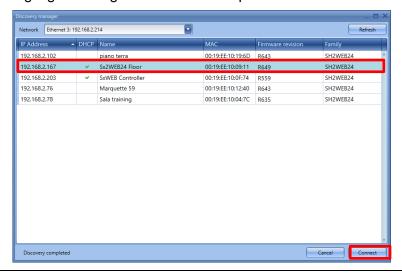


If the PC has more than one network card or has many IP addresses, select the right network in the network list



Note: you must select the same network where the controller is connected

- The Sx Tool starts looking for the controller(s). If one or more units are found, a window will pop-up, allowing you to make a selection of which controller to connect to
- 4 Select the required Sx2WEB controller on the list, the selected controller will be highlighted in light blue colour and press *Connect*



The red LED on the selected Sx2WEB starts flashing and the connection will be established



## 2.8 Connect to the Sx2WEB by means of a modem

The Universal Mobile Modem SH2UMMF124 or the USB Dongle Connection Module SH2DSP24 must be connected to the Sx2WEB through the auxiliary bus on the left side of the Sx2WEB. The modem can be used when the LAN connection is not available.

The table below shows the compatible USB dongle modems:

Manufacturer	Model	Туре
Huawei	MS2131	- 3G Modem
D-Link	DWM 157	- 39 Modern

The modem is configured by means of the Sx tool software: when it is connected to the controller for the first time it is not available, so first it must be configured.

#### 2.8.1 Modem configuration

You need to <u>install the SH2DSP24 adapter module</u> **before** configuring the modem, then follow this procedure:

Step	Action
1	Run the Sx Tool, click on General setting from System settings menu
2	Click on Communication settings tab
3	Select the preferred option in the <i>Data connection in progress</i> check box to enable data communication via the Internet
4	Select the modem used in the project in the Modem type combo-box
5	Select a value from 1 to 24 hours in the Modem periodic reset (hh) combo-box
6	Set the preferred option in Modem ping reset field
7	Enter service Provider name in <b>APN</b> box
8	Enter *99# or *99***1# in <b>Phone Number</b> box
9	Leave <b>Username</b> box blank <u>if</u> the username is not required by the ISP
10	Leave <b>Password</b> box blank <u>if</u> the password is not required by the ISP
11	Click on <b>Confirm</b> to store the modem settings



## 2.8.2 Set the DynDNS parameters

These settings will allow access to the Sx2WEB by using the dynamic IP delivered by the Internet Service Provider from which the SIM card has been bought.

To enable the management of the dynamic public IP address, follow this procedure:

Step	Action
1	Register for an account with one of the Dynamic DNS service providers whose URLs are in the Service provider list
	For example, for DynDNS.org, select <u>www.dyndns.org</u>
2	Run the Sx Tool, then click on the icon <i>DynDNS</i> in the <i>Program setup</i> menu
	File Views Reports Add Program setup Modbus Database Help  Dyn Dyn DNS  DNS  DNS  DNS  DNS  DNS  DNS  DNS
	Current project   Default system   Webserver   Password   IP   DynDNS   Set date   Update   Export system   Import system
	settings settings accounts setup Setup and time firmware settings settings  General settings Network settings Controller System settings
	Note: the icon is active only when the Sx Tool is connected to a Sx2WEB
3	Select the <i>green V</i> to <b>Enable DynDNS</b> check box
4	Select the chosen DynDNS provider from the combo-box
5	Type the <b>Username</b> provided during account registration
6	Type the <b>Password</b> provided during account registration
7	Type the <b>DynDNS domain</b> defined during account registration
8	Click on <b>Set DynDNS</b> settings to the controller to save the new network settings.
	Note: the service will be available after about 6 minutes



## 2.8.3 How to see the Dynamic IP address

The present dynamic IP address, assigned by the Internet Service Provider, can be seen in the *Help* menu in the *Sx2WEB network information* fields, as shown in the red rectangle in the picture below.





#### 2.8.4 How to connect to the Sx2WEB by means of a modem

Follow this procedure to connect to the Sx Tool via modem connection:

Step	Action
1	Run the Sx Tool on your PC

2 I. In the address bar type the DynDNS domain name registered

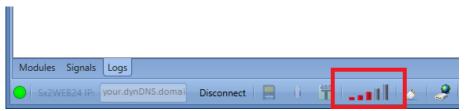


II. Or type the Dynamic IP address delivered by the ISP:



Note: First option is preferable since the Sx Tool is able to auto-update the Dynamic IP address delivered for the DynDNS account each time the modem is reset

3 Click Connect



When a connection is established with the modem, the network signal strength will be shown by a set of bars. The higher the number of red bars, the stronger the network signal.



## 2.9 Connect to the controller with a mini-USB cable

The PC can be connected to the Sx2WEB controller by means of the *mini-B* port available on the front of the housing, protected by the front cover. *Please refer to the Hardware manual for technical information.* 

The following items are required to obtain the connection:

	Item requirement
A	<b>USB 2.0 cable-Type-A / Mini-B</b> (this is not provided with the Sx2WEB controller).
В	A mini-USB driver.zip package available on www.productselection.net website in the SH2WEB24 and SB2WEB24 pages.

The driver installation procedure can change slightly depending on the operating system in the user's PC: please follow the instructions below:

Windows	
10 / 8.1 / 8	How to install the mini-USB driver for Windows 10 / 8.1 / 8
7 / Vista	How to install the mini-USB driver for Windows 7 / Vista

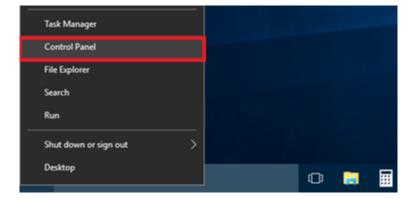


#### 2.9.1 How to install the mini-USB driver for Windows 10 / 8.1 / 8

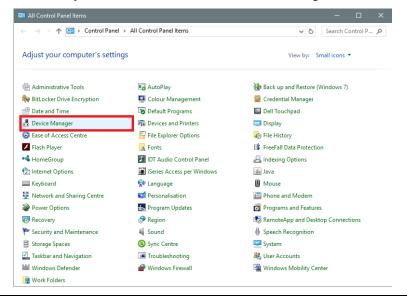
Follow this procedure to install the driver on window 10/8.1/8:

#### Step Action

1 Open *Windows 10 Control Panel* by right-clicking on the *Start* button and click on *Control Panel* 

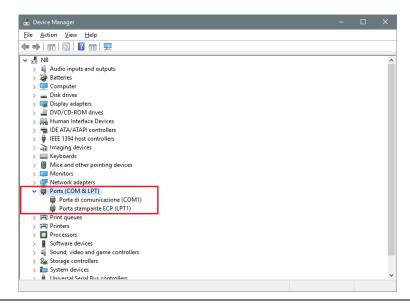


2 In View by: Small icons, click on Device Manager

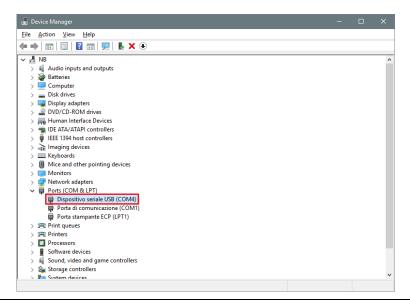




Before connecting the mini-USB cable to the PC and to the Sx2WEB controller, in the list of hardware categories double-click on the category Ports (COM & LPT) and take note of the serial communication (COMx) ports in use. In the example shown below, the only serial communication port is **COM1** 

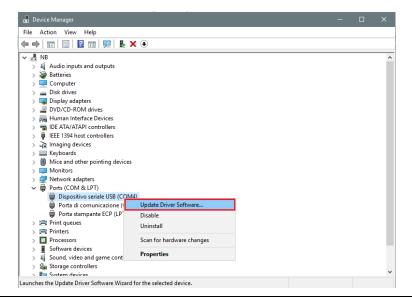


Plug the mini-USB cable into the PC and into the Sx2WEB controller. A new serial communication port (COMx) will automatically be added after a few seconds. In the example shown below the new port added is **COM4** 

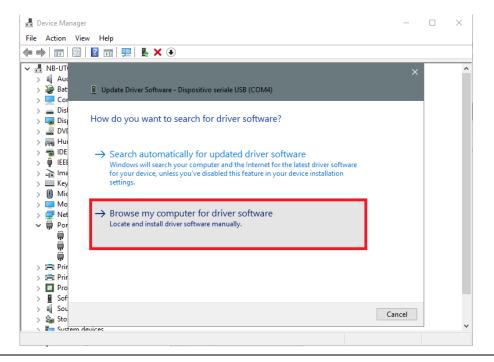




Right-click on the device and select *Update Driver Software...* 

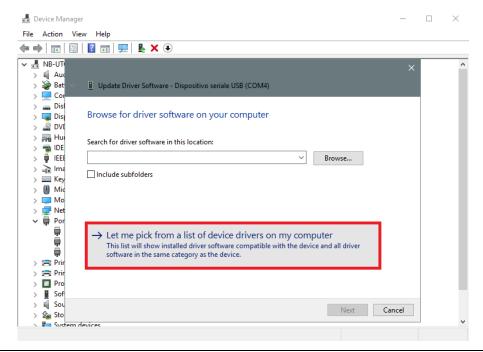


In the pop-up window, select the second option, *Browse my computer for driver software* 

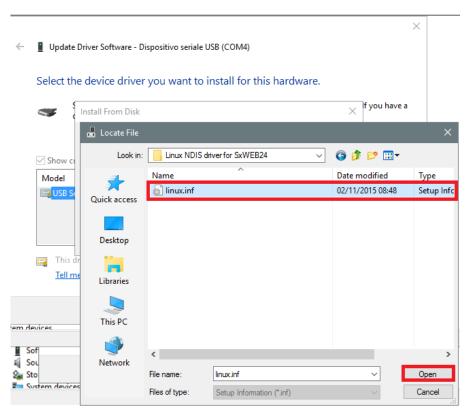




7 In the next page, select the option *Let me pick from a list of device drivers on my computer* 



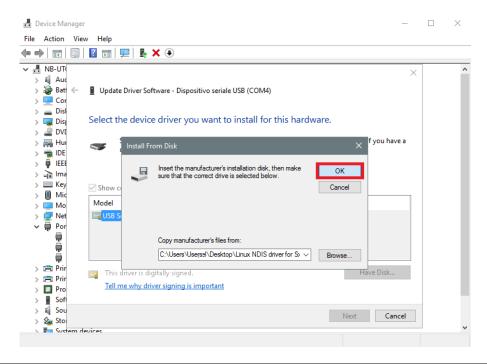
8 Browse for the *linux.inf* file, save it in the PC and press *Open* 



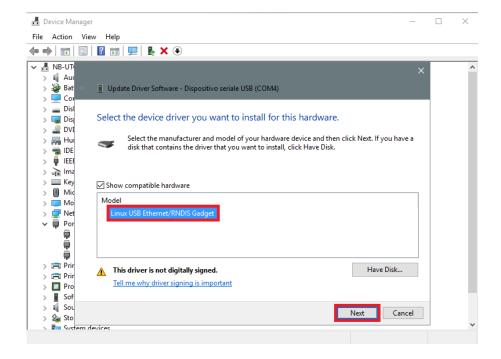


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9 Press *OK* in the next window, as shown in the picture below



The Linux USB Ethernet/RNDIS Gadget is ready to be installed. Click on Next to continue the installation





Follow the instructions below to disable driver signature enforcement **ONLY** if you get the error shown in the picture below, otherwise go to step 12

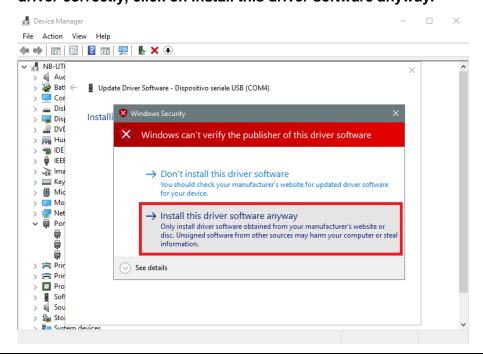


[Windows 10 enforces driver signatures by default. This can be disabled to install drivers that are not digitally signed. Please refer to the following steps to disable driver signature enforcement]

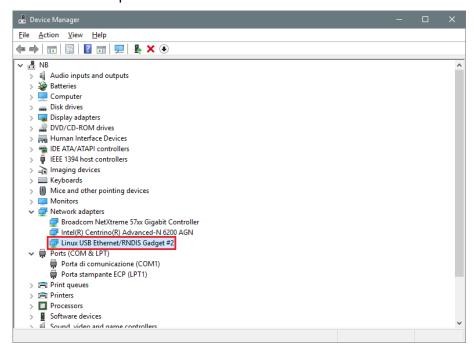
- Click the Start ## menu and select Settings.
- 2. Click Update and Security.
- 3. Click on Recovery.
- 4. Click Restart now under Advanced Startup.
- 5. Click Troubleshoot.
- 6. Click Advanced options.
- 7. Click Startup Settings.
- 8. Click on Restart.
- 9. On the Startup Settings screen press 7 or F7 to disable driver signature enforcement.
- 10. The computer will restart and the user will be able to install nondigitally signed drivers.



N.B. Windows 10 does not detect the Digital signature, so to install the driver correctly, click on Install this driver software anyway.



When the driver has been installed, in the *Network adapter* category a virtual network board named *Linux USB Ethernet/RNDIS Gadget #2 will* be added, as shown in the picture below.





- The driver automatically gives a dynamic IP to the Controller/PC according to the actual IP of the PC. For example, if the PC has the IP 192.168.0.10, the virtual board will be created with a new address 192.168.254.xxx and the address 192.168.254.254 will be assigned to the Sx2WEB controller
- Run Sx Tool and type the IP address **192.168.254.254** in the address bar and click *Connect*:



The green circle icon appears in the left part of the address bar when the connection is established, as shown in the picture below

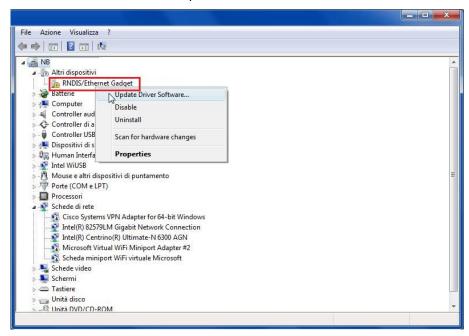


#### 2.9.2 How to install the mini-USB driver for Windows 7 / Vista

Open the archive "mini-USB driver.zip" and save the file linux.inf in your PC, then install the driver by following the instructions below:

Step	Action
1	Plug the USB connector into a free USB port of the PC and the mini-USB connector into the mini-B port of the Sx2WEB
2	Go to Control Panel and open Device Manager

Find the device RNDIS/Ethernet Gadget, right-click on it and select Update Driver Software..., as shown in the picture below:



4 Select the *Browse my computer for driver software* option

How do you want to search for driver software?

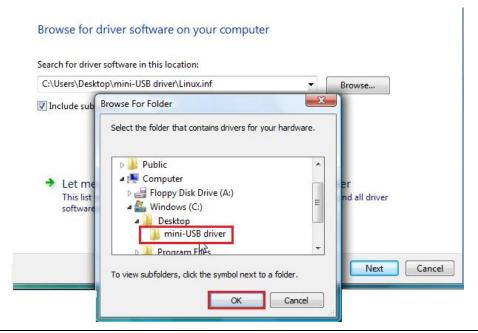
Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device.

→ Browse my computer for driver software Locate and install drive software manually.

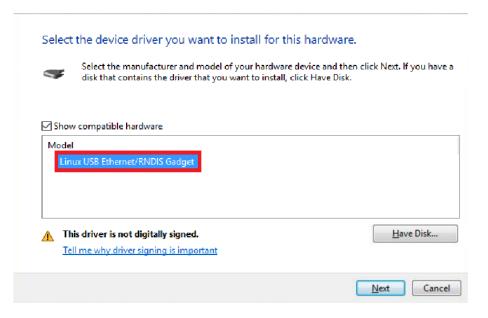


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5 Browse for the *linux.inf* driver file and press *OK* 



The driver Linux USB Ethernet/RNDIS Gadget will be detected: press Next to proceed



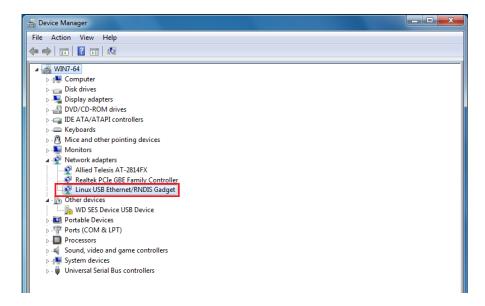


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The driver will be installed, as shown in the picture below



When the driver is installed, in the *Network adapter* category a virtual network board named *Linux USB Ethernet/RNDIS Gadget* will be added, as shown in the picture below:



The driver automatically gives a dynamic IP to the Controller/PC according to the actual IP of the PC. For example, if the PC has the IP 192.168.0.10, the virtual board will be created with a new address 192.168.254.xxx and the address 192.168.254.254 will be assigned to the Sx2WEB controller.

9 Run Sx Tool and type the IP address **192.168.254.254** in the address bar and click *Connect*:



The green circle icon appears in the left part of the address bar when the connection is established, as shown in the picture below



## 3 TROUBLESHOOTING

There are several causes that the IP address can not be changed by the USB procedure:

- The Sx2WEB's blue LED lights up (but the IP address will not be changed)
- The Sx2WEB's blue LED does not light up

# 3.1 Factors contributing to an unrecognized USB Drive or Configuration file

USB Drive issues	Solution
This is the most probable reason Sx2WEB could not detect USB Drive when inserted. The file system must be FAT32 only. NTFS is not recognized	Format USB Drive in FAT32 file system
The USB Drive may not be available, corrupted or outdated which would make the flash drive not recognized.	Try with another USB Drive
Configuration file issues	Solution
The configuration file (controller_settings.shcfg for SH2WEB24) or (controller_settings.sbcfg for SH2WEB24) is not correctly associated with the right Controller's Family e.g. the configuration file controller_settings.sbcfg must be used with a SB2WEB24 controller, viceversa the IP address can not be changed	Save the right configuration file in the USB Drive
The configuration file is not saved in the USB Drive's <b>Root</b> folder e.g. the file is saved in a sub-folder	Save the configuration file in the USB drive's <b>root</b> folder
There are two configuration files in the USB drive,	Keep only the correct configuration file for the Controller in use.
USB Port related Issues	Solution
To determine if this is a USB port problem, test every USB port that you have with different USB Drives. This could be either hardware or software issues, or both.	In this case, you would need a professional to help you correct this.



## 3.1.1 How to change the IP address when a modem is used

The USB change IP operation cannot be carried out if a modem is connected and configured in the project. If a USB dongle modem or the SH2UMMF124 is connected, the USB ports (the one on the Sx2WEB and the one on the SH2DSP24) cannot be used to change the IP address.

Even if the USB blue LED lights ON but the IP address will not be changed, follow this procedure:

Step	Action
1	Open the project on the Sx Tool
2	Click on <i>Program setup</i> menu, <i>System setup</i> and click on <i>Communication</i> settings window
3	In the Communication settings, Data connection mode select <b>Only LAN</b> and click <i>Confirm</i> .
4	Remove the SMS function from the Project
5	Send the configuration to the Sx2WEB controller

N.B. The USB port in the SH2DSP24 is available only for the USB Dongle modem. The USB procedure must be done only with the USB port on the Sx2WEB.

## 3.2 How to write a blank configuration

Follow this procedure to Change the IP address in a brand-new controller only if the USB procedure fails:

Step	Action
1	Connect to the Sx2WEB with Connecting with Secondary Static IP address or Connect to the controller with a mini-USB cable procedure
2	Run the Sx Tool
3	Click on File menu and click on New icon
4	Send the project to the Sx2WEB  N.B: Now you can change the IP address with the USB procedure



## 4 APPENDIX

## 4.1.1 How to Connect the USB Dongle Module SH2DSP24

The SH2DSP24 is a Sx2WEB accessory module that provides a reliable and cost effective way to connect to the Internet by using mobile networks via a dongle modem.



You can follow this procedure to install the SH2DSP24 adapter with 3G dongle Modem:

Step	Action
1	Connect the SH2DSP24 to the left of the Sx2WEB controller
2	Insert the SIM into the dongle USB modem (*) through the SIM slot. Make sure the <b>SIM is not protected by a PIN code</b> (should that be the case, disable the protection). Please refer to the user manual of the model/manufacturer
3	Insert the USB modem into the USB port located on the top of the SH2DSP24 module
4	Connect the 24VDC power supply
5	Configure it by means of the Sx tool software

N.B. Since the USB port used by the dongle modem is the same as the one used by the USB key in the Sx2WEB, the USB key cannot be used if the modem is already connected.



#### 4.1.2 How to connect the universal mobile modem SH2UMMF124

The Universal mobile modem SH2UMMF124 module is no longer available: it is mentioned here only to understand compatibility with the past.



You can follow this procedure to install the SH2UMMF124 modem:

Step	Action
1	Connect the SH2UMMF124 to the left of the Sx2WEB controller
2	Insert the SIM into the SH2UMMF124 modem through the special slot. Make sure the <b>SIM</b> is <b>not protected by a PIN code</b> (should that be the case, disable the protection)
3	Connect the antenna
4	Connect the 24VDC power supply
5	Configure it by means of the Sx tool software