

Ethernet over USB



VEPPNB

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Composite – Ethernet - Serial Solution

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REVISION HISTORY

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TABLE OF CONTENTS

<u>1</u>	<u>OVERVIEW</u>	<u>3</u>
<u>2</u>	<u>PC CONFIGURATION – WINDOWS</u>	<u>4</u>
2.1	Drivers Installation	4
2.2	Network configuration	5
<u>3</u>	<u>PC CONFIGURATION - LINUX</u>	<u>6</u>
3.1	Drivers Installation	6
3.2	Network configuration	6
<u>4</u>	<u>TERMINAL CONFIGURATION - CCP</u>	<u>8</u>
<u>5</u>	<u>TERMINAL CONFIGURATION - SYSMODE</u>	<u>8</u>

1 Overview

This document describes the USB Gadget components in V/OS. It indicates how to configure terminal and windows or linux host to allow Ethernet communication over USB.

2 PC Configuration – Windows

2.1 Drivers Installation

Drivers have to be installed on the host depending on how it communicates with V/OS terminal.

- **VeriFone Unified Driver** for Serial communication
- **RNDIS Driver** for Ethernet over USB communication

VerifoneUnifiedDriverInstaller.msi automatic installer is used for this purpose.

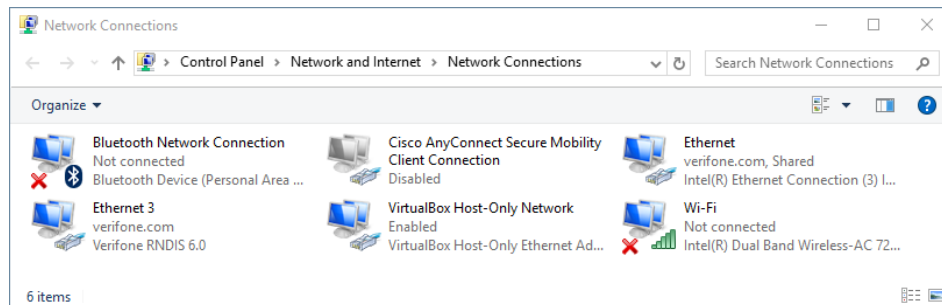
The installer role is to provide and setup:

- **Driver INF Files**
 - One INF files are required for RNDIS driver.
- **VeriFone USB driver**
 - This driver resumes the communication session when the USB cable is unplugged and plugged again.
 - Handling COM port naming and assignment (Ensure the same port is assigned to the device over the cable un-plug/re-plug)
- **RNDIS Driver**

2.2 Network configuration

A “Shared Connection” is necessary in order to link the usb local network and another network. Then, the usb ethernet interface is able to access to the WAN or other LANs.

To configure a Shared Connection, you have to go to “Network Connections” in Control Panel:

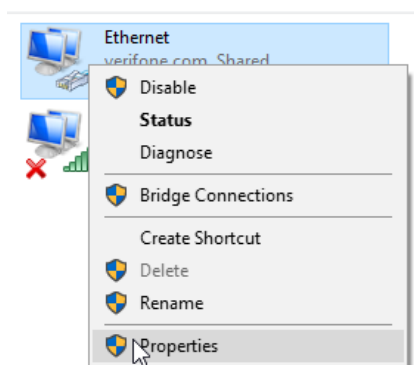


In this case, we will use 2 network interfaces:

- Ethernet : computer's ethernet card. The goal is to access to this network from the device through usb.
- Ethernet3 : The device's USB network interface.

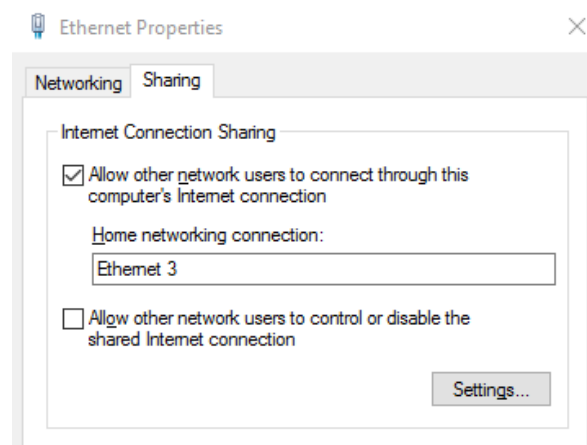
The “Ethernet” should be shared to the “Ethernet3”.

To do that, right click on “Ethernet” and select “Properties”:



Then go to the “Sharing” tab and check the first box.

Note: If you have several network interfaces available, there will be a combo box to choose what network interface will be able to use this shared connection. In our case, “Ethernet 3” will be chosen.



3 PC Configuration - Linux

3.1 Drivers Installation

Linux hosts don't require any particular driver installation. They come part of the distribution. You only need to insert RNDIS module if you want to use ethernet or composite gadget:

```
sudo modprobe rndis_host
```

3.2 Network configuration

If your host PC is connected to the Internet (through WiFi or Ethernet), then you can allow the target device to share the host PC's Internet connection.

Note: It only works if your host PC doesn't have a firewall enabled

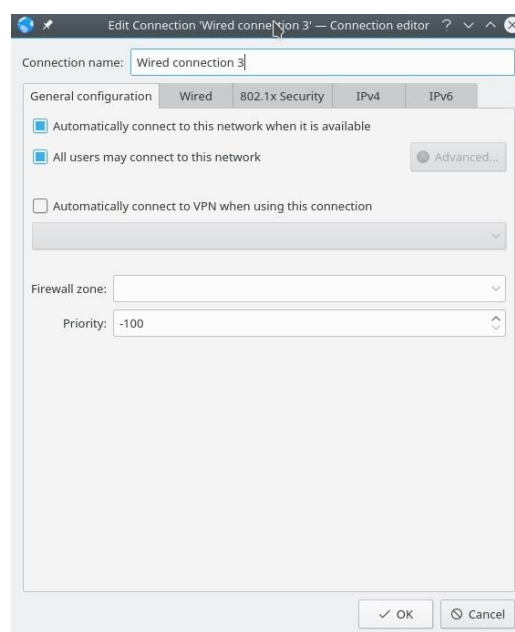
To enable forwarding network packets on your host PC:

```
echo 1 | sudo tee /proc/sys/net/ipv4/ip_forward > /dev/null
sudo iptables -P FORWARD ACCEPT
sudo iptables -A POSTROUTING -t nat -j MASQUERADE -s 192.168.137.0/24
```

To disable forwarding network packets on your host PC:

```
echo 0 | sudo tee /proc/sys/net/ipv4/ip_forward > /dev/null
sudo iptables -t nat -F POSTROUTING
```

Now it's time to configure a network interface, for that in network manager open you USB connection settings. Click on "General" tab, and enable both checkboxes that say "Automatically connect to this network when it is available" and "All users may connect to this network".



Click on "IPv4" tab. Select method: "Manual" and enable checkbox "IPv4 is required for this connection". Then click on "+ add" button and enter static IP configuration:

Connection name: Wired connection 3

General configuration | Wired | 802.1x Security | **IPv4** | IPv6

Method: Manual

DNS Servers:

Search Domains:

DHCP Client ID:

Address	Netmask	Gateway
192.168.137.1	255.255.255.0	0.0.0.0

☒ IPv4 is required for this connection

Routes...

OK Cancel

Address	192.168.137.1
Netmask	255.255.255.0
Gateway	0.0.0.0

Click on "IPv6" tab and select method: "Link-local"

Connection name: Wired connection 3

General configuration | Wired | 802.1x Security | IPv4 | **IPv6**

Method: Link-Local

DNS Servers:

Search Domains:

Privacy: Default

☐ IPv6 is required for this connection

Routes...

OK Cancel

4 Terminal Configuration - CCP

In order to use Ethernet over USB communication on V/OS terminal it is necessary to set USB client mode to RNDIS. It can be done from CCP menu: Configuration -> Network interface -> USB -> USB Client mode where you need to set one of these options:

- Serial + Ethernet (RNDIS)
- Ethernet (RNDIS)

5 Terminal Configuration - Sysmode

USB client mode can be set also from sysmode menu: Administration -> Communication -> USB Gadget Settings, where you need to set USB Network Protocol to RNDIS.