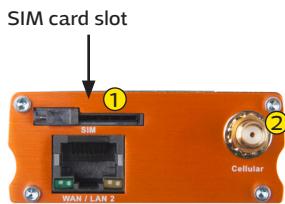


Ouman 3G-MOD4 is a 3G modem which can be used to create a mobile network in premises where such a network does not readily exist. Connection requires a SIM card with data connectivity (preferably with unrestricted data roaming. PIN code query must be disabled). The product package includes a 3G modem, power source and an antenna. SIM card with data connectivity can be acquired from Ouman or your own operator.

In addition, Ouman Access service and an Ouman Access compatible terminal such as Oulink, Ouflex A or external Access device, are needed to establish a secure connection from the Internet to automation devices. For more information about the Ouman Access service, please visit our website at www.ouman.fi → tuotteet/dokumentit (ouman.fi/en/document bank).

Installation and start-up:



The 3G-MOD4 has factory default Oman connection settings. Only check the APN address and change as necessary (see page 2).



- ① Insert SIM card into the 3G-MOD4 device (see attached picture). The card must be a mini-SIM (25 mm x 15 mm). Insert the card inside contact face down and beveled edge ahead.
- ② Connect the external antenna to 3G-MOD3's 4G Antenna connector (cellular). Avoid placing the antenna close to thick stone walls. In demanding conditions, place the antenna as high as possible or next to a window.
- ③ With an RJ-45 cable, connect LAN1 port of the 3G-MOD4 to Access-compatible device's internet / WAN connector. The cable must be CAT-5E or more.
- ④ Plug in the power cords to both devices (power on). The system is now ready for use. When connecting your computer to 3G-MOD4, make sure the computer is adequately secured.

Modem signal lights:

Indicator light	Indicator light status	Functional description
	Red on	Hardware failure (Note! When the modem is connected to power, indicator light comes on for a moment and then goes off. This is totally normal.)
	Red blinking	Software error
Power	Green on	Modem connected to power
	No light	Modem not connected to power
Signal	Yellow light on	Strong radio signal (CSQ > 12)
	Yellow light blinking	Weak radio signal (CSQ 6 -12)
	No light	No, or very weak signal (CSQ 0-5, 97, 98, 99)
Network	Yellow light on	Modem is registered to the network of the service provider
	Yellow light blinking	Modem is in the roaming network. Selection of the network is done according to the SIM-card definition.
	No light	Modem not registered to the GSM network
Activity	Yellow light on	Mobile data service connected
	Yellow light blinking	Network sends and receives mobile data
	No light	Mobile data service not activated
Wi-Fi	Blue light on	Wi-Fi network activated
	Blue light blinking	Wi-Fi sends and receives data
	No light	Wi-Fi not activated

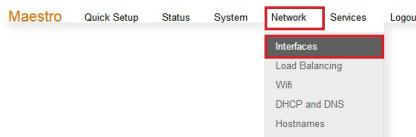
3G-MOD4 technical information

Operator	APN
Operating voltage	9 - 60 VDC, 1A
Operating temperature	-20°C...+55°C
SDRAM	512Mb
SIM	Mini SIM 1.8V / 3.0V
Housing	Brushed aluminum, DIN rail fastening
Dimensions	61,25 x 85,75 x 25,5 mm (without connectors)
Weight	90g
Paino	90g

Take the 3G connection into use

If you have acquired an Ouman 3G connection, the modem is directly ready for use, when you have checked operator's APN address. Change APN address if necessary. Other modem settings can normally stay as they are. If factory settings are for some reason lost, they can be restored (see page 3).

1. The modem must be turned on. DHCP on your computer must be enabled. If you have connected 3G-MOD4 to your computer using an RJ-45 cable, open your browser and go to address **192.168.1.1**. The 3G-MOD4 management page opens. Type **admin** in the Username field, then **admin** in the Password field, and click "log in".
2. Next go to **Network → Interfaces → CELLULAR**.



Tap on the APN field, and enter your operator's APN: "**internet.telia.iot**", "**internet**" or "**internet.saunalahti**". If your operator uses a different address, type it in this field. Tap on the Service Type field and select "**3G / UMTS only**". Save by clicking **Save & Apply**.

Operator	APN
Telia (Ouman 3G-L3)	internet.telia.iot
Telia	internet
DNA (Ouman 3G-L2)	internet
Elisa	internet
Saunalahti	internet.saunalahti

NOTE! Operator connection settings may have changed since writing this manual. If the internet connection does not work with the above mentioned APN settings, check the current settings from the operator.

Take the Wi-Fi into use

Wi-Fi is disabled as default. To enable Wi-Fi, follow these steps:

Take the browser connection to the device (See above section 1). Go to **Network → Wifi**.

Select **Edit**. Go to **Wireless network status** and click "**Disable**". Save by clicking **Save & Apply**.

If you enable Wi-Fi, we recommend that you change your Wi-Fi network name and password. The network name will be given in **General Setup** in the **ESSID** field. The default is the Maestro E200. To change the password in Wireless Security, enter the desired new password in the **Key** field. Save the changes by clicking **Save & Apply**.

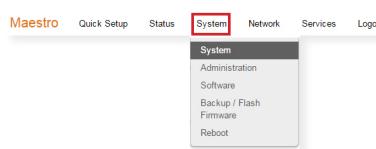
If you enable Wi-Fi connectivity, you need to put Wi-Fi antennas (1-2 pcs) into the modem. The wireless network does not work without external antennas, as there is no built-in antenna in the modem. The antennas are not included in the 3G-MOD4 package, but you can purchase them from Ouman.

Restore factory settings of Ouman

1. To reset the modem to factory settings, press the RESET button at the end of the device for more than 20 seconds with, for example, a partially opened paper clip. The modem must be turned on.
2. DHCP on your computer must be enabled. If you have connected 3G-MOD4 to your computer using an RJ-45 cable, open your browser and go to address **192.168.1.1**. The 3G-MOD4 management page opens. Type **admin** in the Username field, then **admin** in the Password field, and click "log in".

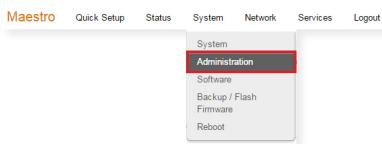


3. In the top menu bar, select **System** → **System**



On System tab, change Timezone to Europe/Helsinki. In **NTP Time Synchronization**, also enable **Enable NTP time sync**. Save by clicking **Save & Apply**.

4. Go to **System** → **Administration**



Under **Dropbear Instance**, change Interface to "lan". Scroll down to the bottom of the page and save by clicking **Save & Apply**.

5. Next go to **Network → Interfaces**.

Maestro Quick Setup Status System Network Services Logout AUTO REFRESH ON

E Series LAN / WAN / Wi-Fi / Cellular Router

WWAN

wwan

Unsupported protocol type.
Install protocol extensions...

Add VPN interface...

Global network options
IPv6 ULA-Prefix: fd57:2a5f:3a1a::/48

Network Watchdog
Enable
Network down timeout in minutes: 120

Save & Apply Save Reset

Make sure the **Network Watchdog** status is set to **enable**. Set your Network down timeout in minutes to **120**. Save by clicking **Save & Apply**.

6. Next go to **Network → Interfaces → CELLULAR**. Tap on the APN field, and enter your operator's APN: "internet.telia.iot", "internet" or "internet.saunalahti". If your operator uses a different address, type it in this field. Tap on the Service Type field and select "3G / UMTS only". Save by clicking **Save & Apply**.

Operator	APN
Telia 3G-L3	internet.telia.iot
Telia	internet
DNA	internet
Elisa	internet
Saunalahti	internet.saunalahti

Maestro Quick Setup Status System Network Services Logout AUTO REFRESH ON

E Series LAN / WAN / Wi-Fi / Cellular Router

CELLULAR

On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use **VLAN** notation **INTERFACE.VLANID** (e.g. **etho.1**)

Common Configuration

Status	Uptime: 0h 33m 59s MAC-Address: 00:00:11:12:13:14 RX 2.22 MB (6157 Pkts.) TX 1.99 MB (5911 Pkts.)
Protocol	Cellular
Cellular Module	HL8518
Service Type	3G/UMTS only
APN	internet

NOTE! Operator connection settings may have changed since writing this manual. If the internet connection does not work with the above mentioned APN settings, check the current settings from the operator.

7. Go to **Network → Interfaces → LAN**. Scroll down to the DHCP server. On the **General Settings** tab, set the DHCP server Leasetime to **4h**. Save by clicking **Save & Apply**.

Maestro Quick Setup Status System Network Services Logout AUTO REFRESH ON

E Series LAN / WAN / Wi-Fi / Cellular Router

LAN

On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use **VLAN** notation **INTERFACE.VLANID** (e.g. **etho.1**)

DHCP Server

General Setup	Advanced Settings	IPv6 Settings
Ignore interface <input type="checkbox"/>	Disable DHCP for this interface <input type="radio"/>	
Start: 100	Lowest leased address as offset from the network address <input type="radio"/>	
Limit: 150	Maximum number of leased addresses <input type="radio"/>	
Leasetime: 4h	Expiry time of leased addresses, minimum is 2 minutes (<input type="radio"/>)	

Save & Apply Save Reset

8. Go to Network → Wifi.

Select Edit

Wireless Overview

SSID	MAC Address	IPv4 Address	Signal	Noise	RX Rate	TX Rate
Generic: MAC80211 802.11bgn (radio0)						

Associated Stations

SSID	MAC Address	IPv4 Address	Signal	Noise	RX Rate	TX Rate		
0%	SSID: Maestro E200 Mode: Master BSSID: A4 AE 9A 00 2A 43 Encryption: mixed WPA/WPA2 PSK (CCMP)		Scan	Add	Disable	Edit	Remove	Edit this network

Device Configuration

General Setup Advanced Settings

Band: 2.4GHz (802.11g+n)

HT mode (802.11n): 20MHz

Country Code: 00 - World
FI - Finland
EC - Ecuador
EE - Estonia
EG - Egypt
EH - Western Sahara
ER - Eritrea
ES - Spain
ET - Ethiopia
FI - Finland
FJ - Fiji
FK - Falkland Islands
FM - Micronesia
FO - Faroe Islands
FR - France
GA - Gabon
GB - United Kingdom
GD - Grenada
GE - Georgia
GF - French Guiana
GG - Guernsey
GH - Ghana

Distance Optimization

Fragmentation Threshold

RTS/CTS Threshold

Interface Configuration

General Setup Wireless Security MAC-Filter

Save & Apply Save Reset

Select **Advanced Settings** tab. Under Country Code, click FI-Finland. Save by clicking **Save & Apply**.

9. Go to General Setup tab and go to Wireless network status and click “Disable”. Save by clicking Save & Apply.

Device Configuration

General Setup Advanced Settings

Status

Mod: Master | SSID: Maestro E200
BSSID: A4 AE 9A 00 2A 43 | Encryption: mixed WPA/WPA2 PSK (CCMP)
Channel: 11 (2.462 GHz) | Tx Power: 20 dBm
Signal: 0 dBm | Noise: 0 dBm
Bitrate: 0.0 Mbps | Country: 00

Wireless network is enabled Disable

Channel: 11 (2.462 GHz)

Transmit Power: 20 dBm (100 mW) dBm

Interface Configuration

General Setup Wireless Security MAC-Filter

Mode: Access Point
ESSID: Maestro E200

Save & Apply Save Reset

10. Go to Network → Interfaces → WAN

Interfaces

Go to **Physical Settings** tab. Select Interface to “Custom Interface”. Save by clicking **Save & Apply**.
NOTE! A red box box is displayed “The selected protocol needs a device assigned”. This notification does not need to be care.

Device Configuration

General Setup Advanced Settings Physical Settings Firewall Settings

Common Configuration

General Setup Advanced Settings Physical Settings Firewall Settings

Bridge interfaces

Interface: creates a bridge over specified interface(s)

- Ethernet Switch: "eth0"
- VLAN Interface: "eth0.1" (lan)
- VLAN Interface: "eth0.2" (wan)
- Ethernet Adapter: "eth1" (cellular)
- Ethernet Adapter: "ipsgt0"
- Ethernet Adapter: "ip6lnl0"
- Ethernet Adapter: "teq0"
- Ethernet Adapter: "tun0" (openvpn)
- Wireless Network: Unknown "Maestro E220" (lan)
- Custom Interface:

Save & Apply Save Reset

11. Go to **General Setup** tab and go to **Protocol** and click "**Unmanaged**". Press "**Switch protocol**". Save by clicking **Save & Apply**.

NOTE! A red box box is displayed "The selected protocol needs a device assigned". This notification does not need to be care.

12. Go to **Network → Interfaces → LAN**. Go to **Physical Settings** tab. Make selections as shown in the picture. Save by clicking **Save & Apply**.

13. Go to **Network → LoadBalancing**.

Go to **Configuration** tab. Select **Policies**.

Click p1 "**Edit**" button. Remove **m1** member by pressing the red "x". Save by clicking **Save & Apply**.

14. Go to **Members** tab. Remove **m1** member by clicking "**Delete**" button.
Save by clicking **Save & Apply**.

Member	Interface	Metric	Weight	Sort			
m3	cellular	3	2				
m2	wwan	2	2				
m1	wan	1	2				

Save & Apply **Save** **Reset**

15. Go to **Network** → **Load Balancing** → **Configuration** → **Interfaces**.
Remove WAN by clicking "**Delete**" button.
Save by clicking **Save & Apply**.

Interface	Enabled	Tracking IP	Tracking reliability	Ping count	Ping timeout	Ping interval	Interface down	Interface up	Metric	Errors	Sort			
wan	Yes	8.8.8.8	1	5	3s	5s	2	2	—	7				
wwan	Yes	8.8.8.8	1	5	3s	5s	2	2	6	6				
cellular	Yes	8.8.8.8	1	3	10s	900s	1	1	7	0				

Save & Apply **Save** **Reset**

16. Go to Network → Firewall → Custom Rules.

The screenshot shows the Maestro E Series web interface. In the top navigation bar, 'Network' is selected. Under 'Network', 'Firewall' is highlighted. On the right, there are two images of the E Series hardware: an orange model and a black model. The main content area is titled 'Firewall - Custom Rules'. It contains a text editor with the following code:

```
# This file is interpreted as shell script.
# Put your custom iptables rules here, they will
# be executed with each firewall (re-)start.

# Internal uci firewall chains are flushed and recreated on reload, so
# put custom rules into the root chains e.g. INPUT or FORWARD or into the
# special user chains, e.g. input_wan_rule or postROUTING_lan_rule.

# This command is required to get WAN port to operate as second LAN port,
# but some additional configuration is also required.
# This line has to be commented out if WAN port is going to be used as WAN port again.
[ -e /sbin/wandete.sh ] && rm /sbin/wandete.sh
```

At the bottom right of the text editor are 'Submit' and 'Reset' buttons.

Add the following program code:

```
# This command is required to get WAN port to operate as second LAN port,
# but some additional configuration is also required.
# This line has to be commented out if WAN port is going to be used as WAN port again.
```

[-e /sbin/wandete.sh] && rm /sbin/wandete.sh

NOTE! Spaces are also relevant. Check that the code is correct.

At the end, press the "Submit" button.

- Finally, sign out by pressing "Logout" button. Disconnect the power cord from the modem. When the modem is switched on next time, the correct settings are ready and the modem is ready for use.

The screenshot shows the Maestro E Series web interface. In the top navigation bar, 'Logout' is highlighted. On the right, there are two images of the E Series hardware: an orange model and a black model. The main content area shows the 'Logout' button.

Once the modem has been configured in accordance with the instructions above, it is recommendable to do backup of the settings again. Go to **System → Backup / Flash Firmware**. Backup is made by pressing the "**Generate archive**" button. Backup is restored by searching for the file from your computer by pressing the "Browse" button and then pressing "**Upload archive**" button.

The screenshot shows the Maestro E Series web interface. In the top navigation bar, 'Logout' is highlighted. On the left, there is a sidebar with 'Actions' and 'Configuration' tabs, where 'Configuration' is selected. The main content area is titled 'Flash operations' and contains sections for 'Backup / Restore' and 'Flash new firmware image'.

Backup / Restore
Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images).

Download backup:

Reset to defaults:

To restore configuration files, you can upload a previously generated backup archive here.

Restore backup: Ei valittua tiedostoa.

Flash new firmware image
Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires an OpenWrt compatible firmware image).

Keep settings: