

User and configuration manual

UCM-97 GPRS/GSM Communicator

Introduction

With the UCM-97 GPRS Communicator you are given wireless access to all the features offered by ordinary networking facilities via TCP/IP. In addition, you have the option to access any device with a serial interface via LAN, WAN, Intranet and Internet. Your device does not have to support TCP/IP or PPP to work with the UCM-97. We provide tunnel facilities to pass any proprietary or open serial protocols to anywhere on your network.

UCM-97 GPRS/GSM Communicator features

The UCM-97 GPRS Communicator in the basic version offers:

- GPRS Class 2 and GSM communication facilities.
- Built-in WebServer used for configuring the device with a standard browser like MS Internet Explorer.
- All WebServer functionality is built-in and ready to use, including customisation of Web pages.
- Multi networking protocol support; HTTP, UDP, PPP, FTP, SMTP, Telnet and transparent serial via RS232.
- Email and SMS support
- WAP – browse the Communicator with your WAP phone.
- Interfaces:
 - Ethernet 10BASE-T.
 - RS232 V24 or RS485.
 - SMA GPRS/GSM connector for external antenna.
 - SIM card holder.
 - 12-48VDC power supply input
- Industrial mounting on 35mm DIN rail.
- Full remote configuration, remote service and remote software update of the module.

Options:

- Built-in AVR 8-bit CPU with serial RS232 interface to handle application specific control parameters or specific driver implementation. Can be programmed by us or by you.
- BC Local Bus for connecting I/O modules direct to the module.
- Software enhancements like routing facilities, additional networking protocol support and specific protocol implementations

Applications

- Wireless Ethernet network connection – UCM-97 to UCM-97 communication.
- Wireless transparent serial connection – UCM-97 to UCM-97 communication.
- Wireless remote Network connection – Client PC to UCM-97 communication.
- Wireless remote serial or COM port connection – Client PC to UCM-97 communication.
- Wireless remote WebServer – Web pages of your device in Internet or Intranet.

Note that all these facilities can be combined in the same module. The full networking functionality makes it possible to have up to 10 clients looking at the same Web page and, at the same time, you can access the remote serial interface for transferring transparent data.

Getting started

IMPORTANT

It will be an advantage to have a basic knowledge of TCP/IP and Ethernet networking before you start using the UCM-97.

The UCM-97 is assigned an IP address and this can be found on the back of the module. You will also find the unique MAC address of the unit.

Configuration of the module is done in the module WebServer homepages. You therefore need to connect the module to a PC with a browser using the Ethernet interface.

There are basically 2 ways of connecting the UCM-97 GPRS Communicator;

- Directly from your PC to the UCM-97.
- Via an existing network in your workshop or office.

Connect directly from your PC to the UCM-97

Connecting directly from your PC is the most common way of connecting to the UCM-97. This because the UCM-97 has been preassigned a factory default IP address (printed on the back of the module).

NOTE: When connecting directly to your PC network adapter, be sure to use a crossover Ethernet patch cable. The procedure is as follows:

In the properties dialog page (if you are running MS Windows) of your Network – Ethernet –TCP/IP configuration be sure to assign your PC a valid IP address in the same subnet as written on the UCM-97 module.

Example:

UCM-97 IP address:	192.168.100.175
Your PC IP address:	192.168.100.1
Your PC Subnet mask:	255.255.255.0

- Connect the UCM-97 to your Ethernet network and apply power.
- After approximately 20 seconds the module has booted.
- From a command prompt type: “ping 192.168.100.175”. Be sure you have response from the UCM-97.
- Use a standard Web browser to open the network page: <http://192.168.100.175>. The index page will be displayed. If not be sure you have disabled use of proxy in your browser settings.
- Now enter the Network Configuration page. See the figure below. You will be asked for a username and password – by default, both are “admin”. In the “IP address” field you can enter a new IP address and press the “save” button. Finally, you must click the “boot” button (the boot button will show up if you have made any changes) and the UCM-97 will reboot and is configured with the selected IP address.

NOTE: Remember to change your PC IP address according to the changes you have made on the UCM-97 module.

After the module has been booted, you are ready to change all the necessary settings for the serial lines, GPRS, etc.

NOTE: You must expect some delays whilst your PC TCP/IP driver is connecting to your UCM-97. After making changes, the driver will search for network components, and you should expect this to take some minutes.

TCP/IP Network Configuration

Use this page to configure TCP/IP network settings. The network configuration is automatically configured if DHCP is enabled. The DHCP setting will query a DHCP/BOOTP server on the network for network parameters.

If no DHCP/BOOTP server is present on the local network, please press the **Advanced** button for manual configuration. Use the checkboxes in the upper part of the form to enable/disable automatic configuration.

Automatic IP configuration	
Setting [Active value]	New value
Ethernet [00:d0:c8:00:03:08]	
DHCP [inactive]	☐ Click to enable
RARP [inactive]	☐ Click to enable
AutoIP [inactive]	☐ Click to enable
IP Routing [off]	off
IP Address [192.168.100.175]	192.168.100.175
Subnet mask [255.255.255.0]	
Default Gateway [192.168.111.111]	
Domain []	
Nameserver [194.239.134.83]	
Hostname [io000308]	
Timeserver [0.0.0.0]	
SMTPserver []	
PPP Protocol settings	
Serial Device	sp1
Local IP Address [62.242.157.86]	
Remote IP Address [192.168.111.111]	
PAP Username	
PAP Password	
Revert	Save

Created by WebScript from [this script](#)

Figure 1

Connect via an existing network

Before you connect the UCM-97 to an existing network you must be sure that your network is in the same IP subnet range as the UCM-97 (192.168.100.x). As this is most often not the case we recommend that you use the method mentioned above.

However if you do not have a crossover patch cable or for some reason can't establish communication to the UCM-97 module it is possible to assign an IP address to the module by using what is called AutoIP. Normally you don't need to enter this procedure but if please look at appendix A.

Setting up UCM-97 for GPRS

The UCM-97 needs the following settings to be entered to work with GPRS:

- APN: Access Point Name
- Username: As used when you connect to an external server using dial-in networking.
- Password: As used when you connect to an external server using dial-in networking.

APN settings:

From the main page, enter the Serial line setting page. Select the SP1 (Auxiliary Serial Line) which is the serial line connected internally to the GPRS engine. Enter the APN in the "Phone no" field. The APN must be enclosed in quotation marks, e.g. "Internet" and please note that all entries are case sensitive.

When changing settings for SP1 be sure that the following settings are configured:

- Baud rate: 38400
- Serial mode: 8N1
- Flow control: Hardware

Every time UCM-97 connects to a GPRS network it will receive an IP address from the provider. You can configure the module to send a SMS message informing about the provided IP address. In the Alert field you type in the phone number.

When entered, apply the "save" button. Now return to main page.

Auxiliary Serial Line

Use this page to configure device parameters. Please modify the desired configuration parameters in the dialog below and press the button to save the new configuration.

Serial Line Parameters	
Baud rate	38400
Serial mode	8N1
Flow control	hardware

Modem Parameters	
Phone#	"Internet"
Alert#	

Auxiliary Parameters	
RxBuffer	
TxBuffer	512
RxBundle	

Revert Save

Created by WebScript from [this script](#)



Figure 2

Username and password settings:

User and password settings are entered under the Network Configuration page (Figure 1).

In the PPP Protocol settings section, select the SP1 serial interface. The username and password are entered in the PAP Username and Password fields. Note that they are case sensitive. If no username and password are defined for your GPRS account, leave the fields blank.

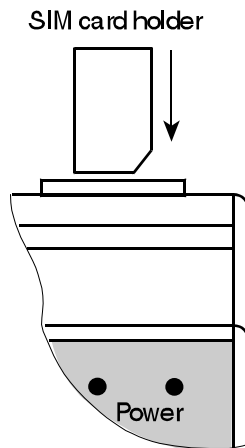
It is very important that you enter the settings correctly in these sections!

After applying the new settings, press the "save" button again.

Now the necessary GPRS settings are entered and you must reboot the UCM-97. Press the "reboot" button at the bottom of this Web page, and the UCM-97 will reboot and the new settings will be used.

Connecting to the GPRS network

The UCM-97 is now ready for GPRS. Disconnect the power and place your GPRS-enabled SIM card in the SIM card slot. See the figure of direction of the SIM card below. Press gently the SIM card down till you feel a small "click" and the SIM card is fixed. (The SIM card is removed again by pressing it down till it is released). Finally fit the antenna and connect the power again.

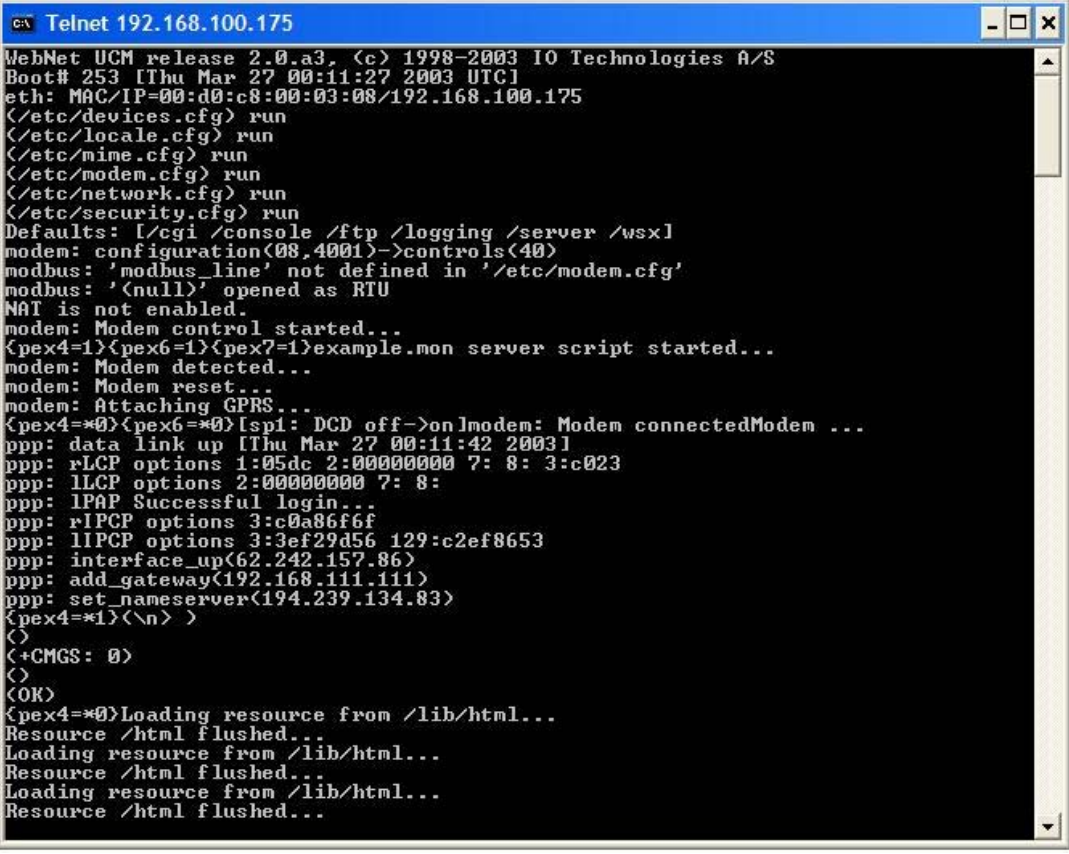


After the UCM-97 is started, you can check that the GPRS is up and running by entering the Network Configuration page. In the field "Local IP address", the IP address of the GPRS network will be shown. This may take several minutes and you have to use the "refresh" button on the Web Browser to update the page.

Alternatively, you can monitor the connection procedure by using a Telnet window. The UCM-97 is set up with port 911 for tracing the connection procedure. To monitor, open a DOS box and enter "Telnet 192.168.100.175 911" and press "enter".

NOTE: the "IP address" must be the UCM-97 IP address – NOT the GPRS network IP address.

A Telnet window will now pop up.

A screenshot of a Telnet window titled 'Telnet 192.168.100.175'. The window shows a series of commands and responses from a WebNet UCM device. The responses include system information like 'WebNet UCM release 2.0.a3', boot time, MAC/IP address, and the execution of various configuration files. It then shows the setup of defaults, modem configuration, and a successful GPRS connection. Finally, it displays PPP negotiation details, including link up, options exchange, and successful login, ending with the interface IP address 62.242.157.86.

```
WebNet UCM release 2.0.a3, <c> 1998-2003 IO Technologies A/S
Boot# 253 [Thu Mar 27 00:11:27 2003 UTC]
eth: MAC/IP=00:d0:c8:00:03:08/192.168.100.175
</etc/devices.cfg> run
</etc/locale.cfg> run
</etc/mime.cfg> run
</etc/modem.cfg> run
</etc/network.cfg> run
</etc/security.cfg> run
Defaults: [/cgi /console /ftp /logging /server /wsx]
modem: configuration(08,4001)->controls(40)
modbus: 'modbus_line' not defined in '/etc/modem.cfg'
modbus: 'null' opened as RTU
NAT is not enabled.
modem: Modem control started...
<pex4=1><pex6=1><pex7=1>example.mon server script started...
modem: Modem detected...
modem: Modem reset...
modem: Attaching GPRS...
<pex4=*0><pex6=*0>[spi: DCD off->on]modem: Modem connectedModem ...
ppp: data link up [Thu Mar 27 00:11:42 2003]
ppp: rLCP options 1:05dc 2:00000000 7: 8: 3:c023
ppp: lLCP options 2:00000000 7: 8:
ppp: IPAP Successful login...
ppp: rIPCP options 3:c0a86f6f
ppp: lIPCP options 3:3ef29d56 129:c2ef8653
ppp: interface_up(62.242.157.86)
ppp: add_gateway(192.168.111.111)
ppp: set_nameserver(194.239.134.83)
<pex4=*1><\n> >
<>
<+CMGS: 0>
<>
<OK>
<pex4=*0>Loading resource from /lib/html...
Resource /html flushed...
Loading resource from /lib/html...
Resource /html flushed...
Loading resource from /lib/html...
Resource /html flushed...
```

Figure 3

If the GPRS connection is successful, the trace should be as shown above. Note the PPP: interface_up IP address is also the address of the IP address for the GPRS network

Setting up the serial interface on the UCM-97

At the main page select the Serial Line Setting page. Select the "SP0 Primary Serial line" (Figure. 4) which takes you to the Serial Line Configuration page. Select baud rate, serial mode and flow control. The modem parameters are only used when connected to an external modem.

Figure 4

Setting up the serial port for transparent serial communication

If you want to set up the port as a remote COM port, you must define the TCP/IP port setting.

From the main page select the Shared Device page. The page shown below will appear (Figure. 5).

Set the "Server TCP port" to, e.g. "1001" (this is the port you must use when connecting remotely).

Set the "timeout" to 30-50 ms.

The "auto connect" field is only used if you are going to connect 2 UCM-97 point-to-point for transparent serial communication. In the "auto connect" field you must enter the IP address of the other UCM-97 in the network at both ends.

If you are using a driver on a PC (like IOTOOL32 Modbus over IP or the SerialIP software) and the connection is initiated from the PC, the field must be left blank.

Save the settings and reboot the UCM-97.

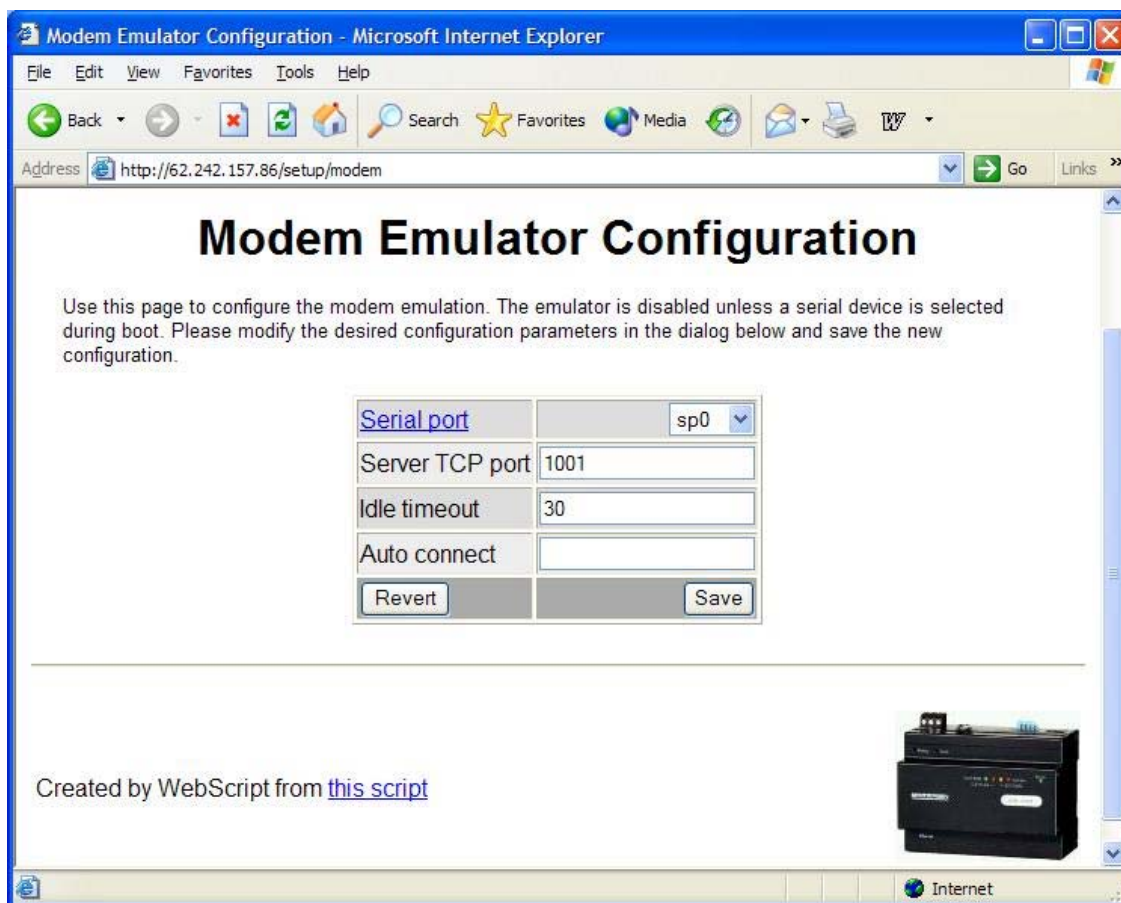


Figure 5

Setting up UCM-97 as Router

If you want to establish a network of clients on the Ethernet side of the UCM-97 and use UCM-97 as router you must enable the “NAT” (Network Address Translation) functionality in the “Change Network Settings” menu (Figure 1).

Browse the Internet using UCM-97 as Gateway:

- Switch on the NAT functionality of the UCM-97 and boot the module
- Change the network settings of the PC to include the local IP number of the UCM-97 as default gateway.
- Change the network settings of the PC to include the IP number of the Nameserver (DNS) provided by the GPRS provider (see Figure 3).

Browse a network of servers connected to the Ethernet port of the UCM-97:

If you want to be able to browse a network of servers remote utilising only 1 GPRS modem typically you need a router because the provider only offers you one IP address. UCM-97 has included a routing facility offering “port remapping”.

- Switch on the NAT functionality of the UCM-97
- From the main menu select “Configure NAT”
- Edit the file entry to full fill the port remapping and press save
- Reboot the module

Appendix A

Assigning an IP address to the UCM-97 module using AutoIP:

NOTE: If you are connected to the UCM-97 using an existing network be sure there is no Ethernet Switch between your PC and the UCM-97 module. An Ethernet Hub is OK.

Assume your PC is assigned an IP address on the 192.168.100.x sub-net, and your UCM-97's MAC address is 00:D0:C8:00:1A:BC (printed on the back of the module). To assign IP address "192.168.100.175" to the module you must:

- Connect the UCM-97 to your Ethernet network and apply power.
- After the UCM-97 is started (after approx. 20s) you must enter the Secure mode by pressing the "Debug" button for 10s (located in the top left corner of the module). The module will now enter the AutoIP mode. In this mode the UCM-97 will be assigned the first IP address which is received with its MAC address.
- To assign the address, you must put in a static entry in the arp table. To do that, open a DOS box and type "arp -s 192.168.100.175 00-D0-C8-00-1A-BC" in a command prompt on your PC (00-D0..... is the MAC address of your UCM-97).
- Type "ping 192.168.100.175", and when the module responds to the ping command, it has been assigned a preliminary IP address.
- Type "arp -d 192.168.100.175" to remove the static entry from the PC's arp table. Check the table with "arp -a" which will list the arp table. The module is now assigned a valid IP address and is ready for use.
- Press the "restart" button to take you out of Secure mode.
- Use a standard Web browser to open the network page: <http://192.168.100.175>. The index page will be displayed.
- Now enter the Network Configuration page. You will be asked for a username and password – by default, both are "admin". In the "IP address" field you must enter the final IP address and press the "save" button. Finally, you must activate the "boot" button and the UCM-97 will reboot and is configured with the selected IP address.

DO NOT CHANGE ANY OTHER SETTING IN THIS SECURE MODE – DOING SO WILL CORRUPT THE CONFIGURATION.

This document is preliminary and is subject to changes without notice

File: 40153 UCM-97 User Manual 18_03