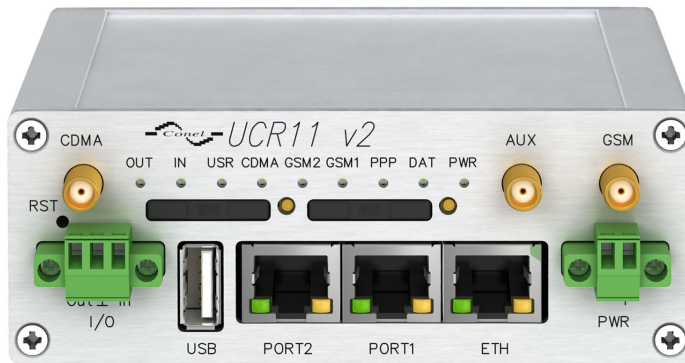








AT commands

APPLICATION NOTE



Symbols used

-  Danger – important notice, which may have an influence on the user's safety or the function of the device.
-  Attention – notice on possible problems, which can arise in specific cases.
-  Information, notice – information, which contains useful advice or special interest.
-  Example – example of function, command, or script.

GPL licence

Source codes under GPL licence are available free of charge by sending an email to info@conel.cz.



**Declared quality system
ISO 9001**



Content


1.Description of AT commands.....	1
1.1.ATE.....	1
1.2.AT+CMGF.....	1
1.3.AT+CMGS.....	1
1.4.AT+CMGL.....	1
1.5.AT+CMGR.....	2
1.6.AT+CMGD.....	2
1.7.AT+CPMS.....	2
1.8.AT+CSCA.....	3
1.9.AT+CSCS.....	3
1.10.AT+CPIN.....	3
1.11.AT+CREG.....	3
1.12.AT+CSQ.....	4
1.13.AT+CGMM.....	4
1.14.AT+GMM.....	4
1.15.AT+GSN.....	4
1.16.AT+CIMI.....	4
1.17.ATI.....	4
1.18.AT+CGPADDR.....	5
1.19.AT+CMGW.....	5
1.20.AT+CMSS.....	5
1.21.AT+COPS?.....	5
1.22.AT+GMI.....	6
1.23.AT+CGMI.....	6
1.24.AT+GMR.....	6
1.25.AT+CGMR.....	6
1.26.AT+CGSN.....	6
2.List of AT commands.....	7

Table list

Table 1: List of AT commands.....	7
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1. Description of AT commands

After establishing connection with the router via serial interface or Ethernet, it is possible to use AT commands for work with SMS messages.

 This application note only lists the commands that are supported by Conel's routers. For other AT commands is always sent **OK** response. There is no support for treatment of complex AT commands, so in such a case router sends **ERROR** response.

1.1. ATE

ATE<value> command determines whether or not the device echoes characters. By default this function is disabled, but may be useful for debugging purposes.

- <value> is 0 characters are not echoed
- <value> is 1 characters are echoed



```
ATE1          Enter
OK
```

1.2. AT+CMGF

To set the presentation format of short messages is used *AT+CMGF*=<mode> command.

- <mode> is 0 PDU mode
- <mode> is 1 text mode



```
AT+CMGF=1     Enter
OK
```

1.3. AT+CMGS

This command allows you to send a short message to entered number. After sending the command *AT+CMGS*="number" and pressing *Enter* key wait for the character >. Behind this mark it is possible to write your message. The text string is terminated and sent by *CTRL+Z* (it takes some time). SMS writing can be canceled by pressing *Esc* key.



```
AT+CMGS="465717171"   Enter
>Hello World!         CTRL+Z (shortcut key)
OK
```

1.4. AT+CMGL

The *AT+CMGL* command is used to list messages of a certain status from a message storage area. If you use this command in the form *AT+CMGL*="ALL", you get a list of all stored messages. If the status of a message is "received unread", after being retrieved by the *AT+CMGL* command, the status is changed to "received read".

```
+CMGL: <index>, <status>,<sender number>, ,<date>,<time>
SMS text
```

Parameters have the following meaning:

- <index> location of the message in the message storage area.
- <status> specifies the message status
 - REC UNREAD received unread
 - REC READ received read
 - STO UNSENT stored unsent
 - STO SENT stored sent
 - ALL lists all messages
- <sender number> tel. number from which the message was received
- <date> date when the message was received
- <time> time when the message was received



```
AT+CMGL="ALL"          Enter
+CMGL: 1,"REC UNREAD","+420465717171",,"08/02/02, 10:33:26+04"
Hello World!
```

1.5. AT+CMGR

The *AT+CMGR* command is used to read a message from a message storage area. The location of the message to be read from the message storage area is specified by an <index> number. If the status of a message is "received unread", after being retrieved by the *AT+CMGR* command, the status is changed to "received read". Each message is displayed in this form (parameters are described in the previous command):

```
+CMGR: <index>,<status>,<sender number>, ,<date>,<time>
SMS text
```



```
AT+CMGR=1              Enter
+CMGR: 1,"REC READ","+420465717171",,"08/01/12, 9:48:04+04"
Hello World!
```

1.6. AT+CMGD

This command deletes a message from the location <index>.



```
AT+CMGD=1              Enter
OK
```

1.7. AT+CPMS

To select SMS memory storage types to be used for SMS reading, writing, deleting, sending or receiving, you should perform a set operation with the *AT+CPMS* command. For SIM card is used "SM". Expected response is a string in the following form:

```
+CPMS: <used1>,<max1>,<used2>,<max2>,<used3>,<max3>,
```

where the *used* items indicates the number of messages currently in this memory, the *max* items indicates the number of messages that can be stored.



```
AT+CPMS="SM","SM"     Enter
+CPMS: 1,10,1,10
OK
```

1.8. AT+CSCA

This command sets the short message service centre (SMSC) number to be used to send SMS text messages.



```
AT+CSCA="+491710760000"      Enter
OK
```

1.9. AT+CSCS

To change the character set is used *AT+CSCS=<set>* command. If this command is entered in the form *AT+CSCS=?*, the response is a list of supported character sets.



```
AT+CSCS=?                    Enter
+CSCS: ("GSM","IRA","HEX")
```



```
AT+CSCA="HEX"                Enter
OK
```

1.10. AT+CPIN

The *AT+CPIN?* command is used to query whether the PIN code is expected. If the response is *+CPIN: READY*, the SIM card requires no PIN code and is ready for use. In case that the SIM card requires PIN code (response is *+CPIN: SIM PIN*), it can be entered by command *AT+CPIN=<PIN>*. If the PIN code is entered incorrectly more than three times, the SIM card is blocked and the PUK code is required (response is *+CPIN: SIM PUK*).



```
AT+CPIN="2654"                Enter
OK
```

1.11. AT+CREG

Displays network registration status. After entering the *AT+CREG?* command is returned the response in this form:

```
+CREG: <n>,<stat>,
```

where <n> corresponds to one of the following values:

- 0 disable network registration unsolicited result code
- 1 enable network registration unsolicited result code

and <stat> (registration status) corresponds to one of the following values:

- 0 not registered, not searching a new operator
- 1 registered, home network
- 2 not registered, currently searching a new operator
- 3 registration denied
- 4 unknown
- 5 registered, roaming

If you use the *AT+CREG=<n>* command, enable or disable network registration unsolicited result code.



AT+CREG=1 Enter
OK

1.12. *AT+CSQ*

This command returns the signal strength of the registered network. The response is in the form *+CSQ: <rssi>,<ber>*, where *<rssi>* is the received signal strength indication and has value from 0 (-113 dBm and lower) to 31 (-51 dBm and higher), or 99 if the signal strength is not known or not detectable. The *<ber>* parameter is channel bit error rate. It can be detected only during a call, in other cases has a value 0 or 99 according to SIM card. If this error rate can be measured, its value is from 0 to 7.



AT+CSQ Enter
+CSQ: 28,99

1.13. *AT+CGMM*

Execution command causes the device to return the manufacturer specific model identity.



AT+CGMM Enter
+CGMM: "UCR11 v2"

1.14. *AT+GMM*

See the previous command *AT+CGMM*.

1.15. *AT+GSN*

This command causes the device to return the product serial number.



AT+GSN Enter
+GSN: "5700001"

1.16. *AT+CIMI*

Execution command causes the device to return the International Mobile Subscriber Identity number (IMSI). It is a unique identification assigned to SIM card by mobile operator. An IMSI is usually presented as a 15 digit long number. The first 3 digits are the Mobile Country Code (MCC), and is followed by the Mobile Network Code (MNC), either 2 digits (European standard) or 3 digits (North American standard). The length of the MNC depends on the value of the MCC. The remaining digits are the Mobile Subscription Identification Number (MSIN) within the network's customer base.

1.17. *ATI*

Use the *ATI<value>* command to transmit the manufacturer specific information about the device. The *<value>* parameter is used to select between multiple types of identification information. The value of this parameter starts at zero (0 corresponds to *AT+GMM*).

1.18. AT+CGPADDR

To display the IP address of the ppp0 interface use the AT command *AT+CGPADDR*.

1.19. AT+CMGW

This command allows you to write a short message to SIM storage. After sending the command *AT+CMGS="length"* (this parameter specifies the maximum message length in bytes) and pressing *Enter* key wait for the character *>*. Behind this mark it is possible to write your message. The text string is stored by *CTRL+Z* (it takes some time). SMS writing can be canceled by pressing *Esc* key. The response for this command is information about position, where the message was stored.



```
AT+CMGW="140"      Enter
>Hello World!      CTRL+Z (shortcut key)
+CMGW: 2
```

1.20. AT+CMSS

The *AT+CMSS* command sends a message from SIM storage location value *<index>*. The location corresponds to value that is returned by *AT+CMGW* command. The response is a reference value.



```
AT+CMSS=2          Enter
+CMSS: 12
```

1.21. AT+COPS?

To identify the available mobile networks is used the *AT+COPS?* Command. After entering and pressing *Enter* is displayed the response in the following form:

```
+COPS: <mode><format><operator> ,
```

where the *<mode>* parameter specifies the registration mode:

- 0 automatic
- 1 manual
- 2 de-register from network
- 4 manual/automatic
(if manual selection fails, automatic mode is entered)

and the *<operator>* parameter shows the operator identity ,within speech marks, in the format set by *<format>*:

- 0 long alphanumeric format
- 1 short alphanumeric format
- 2 numeric format



```
AT+COPS?          Enter
+COPS: 0,0,"O2 – CZ"
```


1.22. **AT+GMI**

Execution command causes the device to return the manufacturer specific identity.



```
AT+GMI           Enter  
+GMI: CONEL
```

1.23. **AT+CGMI**

See the previous command *AT+GMI*.

1.24. **AT+GMR**

Execution command causes the device to return the manufacturer specific model revision identity.

1.25. **AT+CGMR**

See the previous command *AT+GMR*.

1.26. **AT+CGSN**

See the command *AT+GSN*.

2. List of AT commands

The commands are listed in alphabetical order.

Command	Description
AT+CGMI	Returns the manufacturer specific identity
AT+CGMM	Returns the manufacturer specific model identity
AT+CGMR	Returns the manufacturer specific model revision identity
AT+CGPADDR	Displays the IP address of the ppp0 interface
AT+CGSN	Returns the product serial number
AT+CIMI	Returns the International Mobile Subscriber Identity number (IMSI)
AT+CMGD	Deletes a message from the location
AT+CMGF	Sets the presentation format of short messages
AT+CMGL	Lists messages of a certain status from a message storage area
AT+CMGR	Reads a message from a message storage area
AT+CMGS	Sends a short message from the device to entered tel. number
AT+CMGW	Writes a short message to SIM storage
AT+CMSS	Sends a message from SIM storage location value
AT+COPS?	Identifies the available mobile networks
AT+CPIN	Is used to query and enter a PIN code
AT+CPMS	Selects SMS memory storage types, to be used for short message operations
AT+CREG	Displays network registration status
AT+CSCA	Sets the short message service centre (SMSC) number
AT+CSCS	Selects the character set
AT+CSQ	Returns the signal strength of the registered network
AT+GMI	Returns the manufacturer specific identity
AT+GMM	Returns the manufacturer specific model identity
AT+GMR	Returns the manufacturer specific model revision identity
AT+GSN	Returns the product serial number
ATE	Determines whether or not the device echoes characters
ATI	Transmits the manufacturer specific information about the device

Table 1: List of AT commands