

Programming iChip to Internet-Enable a GSM or GPRS Modem/Handset

Scope:

The scope of this document is to describe to users of Connect One's iChip™ Internet Controller™ how to interface commands and parameters using Connect One's AT+i™ Application Programming Interface into the application of devices that use various GSM and GPRS modems/handsets.

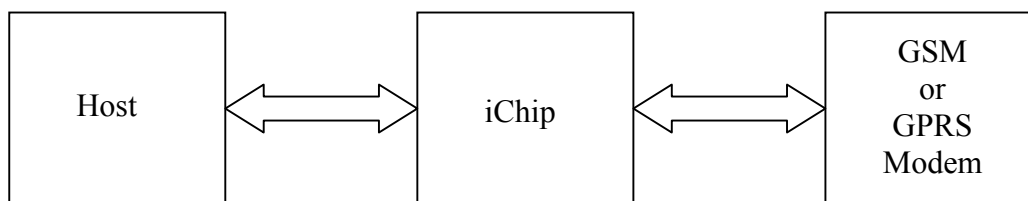
General:

iChip CO561AD-S or iChip Dual CO561AD-D can be connected to any GSM or GPRS modem/handset that (a) has an RS232 interface and (b) supports basic Hayes AT commands like AT, ATZ, and ATDT.

iChip firmware has been fine-tuned to support GSM and GPRS modems/handsets from the major manufacturers. Any host controller working with any operating system (or no operating system) can use iChip with a GSM or GPRS modem/handset to configure flow control and baud rate, for example, and to support specific GSM/GPRS commands.

Method of Operation:

Following is a general description of a typical way to connect iChip and a GSM or GPRS modem/handset to your application.



By default, iChip is always in transparent mode, allowing the host to talk directly to the modem and to take advantage of regular communication tasks, like modem configuration, or specific GSM features like SMS, or GPRS features like data transfer.

Once the need for Internet activity arises, the host will send iChip AT+i commands that instruct iChip to take over the modem and to conduct the required Internet task in Internet mode. For example, if the host wishes to send a text email, after a one-time short configuration, all it has to do is send the iChip the command AT+iEMA:<email body text...>.

Programming Tip 1

iChip will instruct the GSM modem to dial the ISP or to use the existing connection with GPRS, build the PPP connection, login to the ISP by sending the username and password, build the email header and body, and send the email via an SMTP connection – all with no assistance from the host. In this manner, the host controller will continue to take care of the application, without using any processing resources for the Internet connectivity tasks.

Hardware Connection:

The connections between iChip and the host processor and the modem are RS232-based. The connection between the host and the iChip can be (a) a full hardware connection to utilize hardware flow control, or (b) a reduced connection of RX, TX and GND to use only software flow control.

Connections between iChip and the GSM or GPRS modem/handset should be full hardware interface, as iChip takes no resources from the host. This also allows iChip to have better control over the GSM or GPRS modem.

Software Settings for GSM Modems:

GSM modems/handsets are very similar to dial-up modems, so only a few changes to iChip settings should be made before attempting to perform Internet tasks.

1. Setting iChip for blind dialing: since GSM modems are unable to detect dial tone, it is necessary to set iChip to use blind dialing via `AT+iXRC=0`
2. Setting the correct modem type: GSM modems from the various manufacturers require different time-out between commands. Some react differently to `ATZ`, etc. iChip can handle all these difference in a transparent way to the host. To instruct iChip that a GSM modem/handset is connected to it, the command `AT+iMTYP=2` should be sent.
3. Setting Modem Initialization String: this is needed if special settings for the GSM modem/handset are required. To eliminate the need for the host to send special settings before every Internet session, iChip can sort the settings, which it will send to the modem prior to every Internet session. `AT+iMIS=<modem init string>` will trigger iChip to send the Init string to the modem before every Internet session. If no special settings are required, this field can be left empty. However, some modems will deny an empty string, so a simple AT parameter could be used (i.e. `AT+iMTIS=AT`).

Software Settings for GPRS Modems:

GPRS modems and handsets are very similar to dial-up modems, so only a few changes to iChip settings should be made before attempting to perform Internet tasks.

1. Setting iChip for blind dialing: since GPRS modems are unable to detect dial tone, it is necessary to set iChip to use blind dialing via `AT+iXRC=0`

Programming Tip 1

2. Setting the correct modem type: GPRS modems require different time-out between various commands. Some react differently to ATZ, etc. iChip can handle all these difference in a transparent way to the host. To instruct iChip that a GPRS modem or handset is connected to it, the command AT+iMTYP=2 should be sent.
3. Setting the suppress ATZ option: some GPRS modems do not save various internal parameters in the flash memory and the ATZ command sets them to their default value. iChip will start every Internet session with ATZ unless it is told otherwise. The command AT+iMTYP=102 will instruct iChip not to send ATZ at the beginning of the session. iChip will always end a session with ATZ.
4. Setting the APN number: the APN setting for AT+iMIS is assigned by the network operator, in the form of: AT+CGDCONT=1,"IP",xxxxx where xxxxx is the APN. Typical value is "INTERNET". Sample MIS settings for APN number would look like: AT+iMIS="CGDCONT=1,IP,INTERNET".
5. Setting the ISP access details: to gain access to regular ISPs you need to supply the phone number, username and password. The settings are slightly different in a GPRS environment, where the modem is always online. In most cases, the ISP or service provider will not check the username and password, or will ask for a name that is identical for all users. Furthermore, since there is no conventional phone number to dial, most GPRS modems (Siemens, Nokia, Wavecom, Falcom and Novatel) use a reserved key like *99**1#. Other vendors, like Motorola, use combinations like *99#. This information can be obtained from the GPRS device manufacturer.