Roll no: 42428
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Experiment No: 5

Title: AT COMMANDS

Aim: Study GSM and execute AT commands

Pre-requisites:

1. Architecture model of GSM
2. The services provided by GSM
3. Different 2G, 3G standards
4. AT commands

Theory:

What are AT commands?

AT commands are commands which are used to control the modems where AT stands for Attention. These commands were derived from Hayes commands which were used by the Hayes smart modems. Every wireless as well as the dial up modems require an AT command to interact with a computer machine. These AT commands along with other extended commands also require Hayes command set as a subset.

Types of AT Commands

There are two types of AT commands:

1. Basic commands are AT commands that do not start with "+". For example, D (Dial), A (Answer), H (Hook control), and O (Return to online data state) are basic commands.

2. Extended commands are AT commands that start with "+". All GSM AT commands are extended commands. For example, +CMGS (Send SMS message), +CMGL (List SMS messages), and +CMGR (Read SMS messages) are extended commands.

General AT Commands

1) AT - This command is used to check communication between the module and the computer.

For example,

AT

OK

The command returns a result code OK if the computer (serial port) and module are connected properly. If any of module or SIM is not working, it would return a result code ERROR.

2) +CMGF - This command is used to set the SMS mode. Either text or PDU mode can be selected by assigning 1 or 0 in the command.

SYNTAX: AT+CMGF=<mode>

0: for PDU mode

1: for text mode

The text mode of SMS is easier to operate but it allows limited features of SMS. The PDU (protocol data unit) allows more access to SMS services but the operator requires bit level knowledge of TPDUs. The headers and body of SMS are accessed in hex format in PDU mode so it allows availing more features.

For example,

AT+CMGF=1

OK

3) +CMGW - This command is used to store message in the SIM.

SYNTAX: AT+CMGW=" Phone number"> *Message to be stored* Ctrl+z

As one types AT+CMGW and phone number, '>' sign appears on next line where one can type the message. Multiple line messSages can be typed in this case. This is why the message is terminated by providing a 'Ctrl+z' combination. As Ctrl+z is pressed, the following information response is displayed on the screen.

+CMGW: Number on which message has been stored

4) +CMGS - This command is used to send a SMS message to a phone number.

SYNTAX: AT+CMGS= serial number of message to be send.

As the command AT+CMGS and serial number of message are entered, SMS is sent to the particular SIM.

For example,

AT+CMGS=1

OK

5) ATD - This command is used to dial or call a number.

SYNTAX: ATD<Phone number>;(Enter)

For example,

ATD123456789;

6) ATA - This command is used to answer a call. An incoming call is indicated by a message 'RING' which is repeated for every ring of the call. When the call ends 'NO CARRIER' is displayed on the screen.

SYNTAX: ATA(Enter)

As ATA followed by enter key is pressed, incoming call is answered.

For example,

RING

RING

ATA

7) ATH - This command is used to disconnect remote user link with the GSM module.

SYNTAX: ATH (Enter)

Conclusion:

In this experiment we studied GSM architecture and AT commands. We interacted with the SIM900 GSM module via AT commands from a PC terminal software (falcom software). We studied how to make a call, receive a call, and disconnect a call, how to send a SMS, receive a SMS, delete a SMS message and how to set the baud rate, autobaud mode and realized the functionality and use of each of the mentioned AT commands by using them through the terminal software.

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