AKIM ELEKTRONİK LTD.

AKIM GPRS/GSM-MODEM GPRS-22

User Manuel

Rev. 1.2

26.03.2019

This document contains the operating instructions for the AKIM GPRS-22 modem.

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FIGURES TABLE

Intro

Akim GPRS modem is produced in 3 different models. Designed for Akim PLV, Akim Liminigraf and other Akim Data logger devices. GPRS modems have features such as SMS sending, receiving, TCP / IP connection (Server / Client) and Data call. These features can work selectively. When a data call and TCP / IP call are made, the modem automatically makes the transparent connection with the logger devices. It does not interfere with the exchange of information between the device and the server / client computer. Akim GPRS modem is designed to respond to any customer requests. Akim GPRS modem can be used in other logger devices thanks to its functional and transparent connection capability. General view of the device is shown in Figure-1.

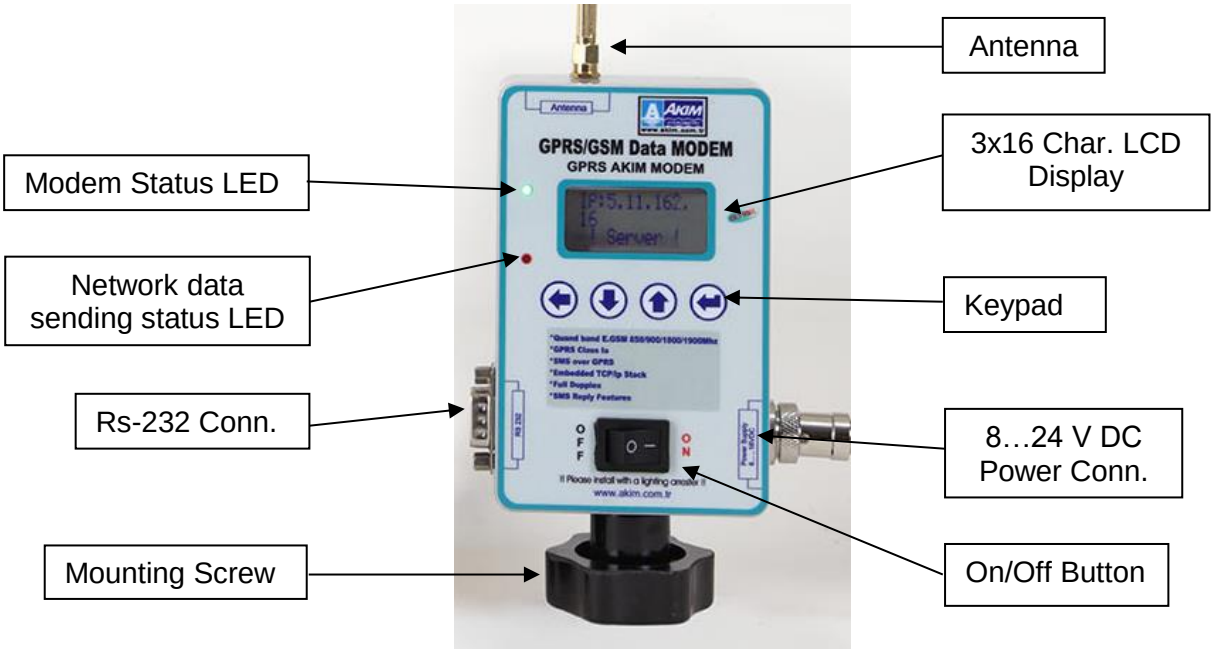


Figure-1: GPRS/GSM Modem Overview

The GPRS modem provides a transparent connection to the server computer when it is running as a client. The modem remains connected to the computer as long as the computer is disconnected. Access to all information on the Logger device is provided. The GPRS modem automatically disconnects if the data exchange is not carried out within 5 minutes during which the GPRS modem remains connected.

Thanks to the modem's SMS receiving and sending, instantaneous values from Logger devices can send SMS to defined phone numbers.

When alarm status information is received from Logger devices, SMS can be sent to three phone numbers registered on the GPRS modem (see Figure-5 on page 6).

The GPRS modem has a reset feature via SMS. The SMS message receiving and sending feature is optional, details on this can be viewed on page 6.

The GPRS modem has the ability to connect with TCP / IP and to respond to data calls. Apart from the fact that these two features can be used at the same time, only the ability to answer data calls can be used alone. If there is no internet connection in the GPRS modem, the device can answer data calls and connect to Logger devices via GSM modem.

The GPRS modem checks a network every minute. In the network control, the antenna power, internet quality and network connection controls can be done automatically. During this check, if the modem is out of server mode, it tries to remain active by trying to enter the server mode again. If the Modem is disconnected from the Network or the Internet, the modem automatically restarts itself. The modem performs this check 3 times. If all three controls have no internet connection or network connection, the modem switches off and on automatically every six hours. This cycle continues until the internet and network connection is reached. The modem has the ability to turn itself off and on every 24 hours.

1. TECHNICAL SPECIFICATIONS

- Power Supply: 8 … 28Volt DC Peak 1,5A
- Standbye: 25mA
  Power off: 62uA
  Idle (registered, power saving): 1.5mA @ DRX=9
  Dedicated mode: <240 mA @ max power level
  GPRS class 10: <420 mA @ max power level
- RS232 Port : 1 Conn.
- SMS Receiving and Sending
- Quad Band EGSM - 850/900/1800/1900MHz
- Output Power
  Class 4 (W) @ 850/900MHz
  Class 1 (1W) @ 1800/1900MHz
- Control via AT commands according to 3GPP TS 27.005, 27.007 and Telit Custom AT commands
- Serial port multiplexer 3GPP TS 27.010
- SIM access profile
- TCP/IP stack access via AT commands
- Sensitivity
  107 dBm (tpy.) @ 850/900MHz
  106 dBm (typ.) @ 1800/1900MHz
- Power consumption (typical values)
- Extended temperature range
  -4o to +80°C (operational)
  -40 to +85°C (storage temperature)
- Point-to-point mobile originated and mobile terminated SMS
- Concatenated SMS supported
- SMS cell broadcast
- SMS Text mode
- SMS over GPRS
- Circuit Switched Data Transmission
- GPRS Class 10
- Mobile station class B
- Coding scheme 1 to 4
- Network LED support
- Embedded TCP/IP stack, including TCP, IP, UDP, SMTP, ICMP and FTP protocols

2. USING INSTRUCTIONS

The energy required by the GPRS / GSM modem device is 8…28 volts DC. In order to be connected to the grid, a high gain antenna or a yagi antenna is required. When the modem is connected to the appropriate data loggers via the RS232 cable, the device is ready for operation.

There are 3 section on the Menu(Fig-2)

1- **MODEM SETP:** Necessary information to install the modem and connect to the internet are entered and displayed in this section. It is the section where the APN name, user name and password and setup flags and phone numbers are processed and seen.

2- **MODEM INFO:** Gives information about the module. It contains information such as serial number of module, imei number, version number.

3- **MODEM RST:** Used to turn the module off and on. When this menu is entered, it turns on the modem if the module is turned off, if the modem is off, it turns the module off and on again, and starts re-installing the modem.

Detailed information about these menus is described in detail with figures below.

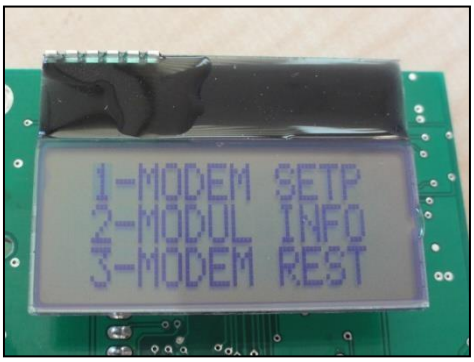


Fig-2: Menu

If the enter button is pressed while the modem is on, the menu in figure 2 opens.

2.1. Modem Setup

When the enter button is pressed from the main menu, the display in Figure-4 is displayed. When the down key is pressed, you can navigate through the menu, change the changeable parameters, and only observe the parameters which are not changeable. You can change the value at the cursor position. An overview of the keypad is shown in Figure-3.

UP Button: Used to change values. Pressing this key step by step increases the values.

Down Button: Used to change values. İt is work specific menus(letter changing etc.)

Enter Button: It is used to save the desired parameter value, to move to the other menu and skip the line. When you change the parameter value, it comes to the last column of the value and pressing the Enter key for a long time saves the parameter value than move on next sub menu. After moving on the next menu it means the values you have changed are saved.

Back Button: It is used to navigate menus. When you push the button you can move on the next menu or sub menu.

Fig-3: Keypad

Fig-4: PC1 IP Number

The IP address of the server computer that will be connected to PC1 IP and PC2 IP is entered in IPv4 format. It is used to send the alarm information and instant information from the logger to the desired time interval. The IP is entered between 000,000,000,000 … 255,255,255,255.

Fig -5: Tel Number Screen

Three different phone number can be entered in Tel1 No, Tel2 No and Tel3 No sections. Instant values are periodically sent to these numbers. Also The alarm information from the Logger device is sent to the persons whose phone numbers are written here.

Fig -6: 'PC1 PORT NO' Screen

Enter the TC / IP Port number to be connected to two server computers, ir PC1 PORT NO IP and ıla PC2 PORT NO '. Enter a value between 0 and 65535.

GSM PORT NO: GPRS The TCP / IP port number is entered in the modem server mode to connect the computer program. Enter a value between 0 and 65535.

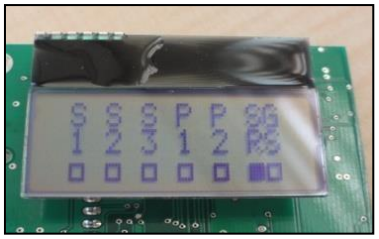
Fig -7: 'GSM PORT NO'

GSM STATION : GPRS Modem station number. Enter a value between 0 and 99999.

Fig -8: 'GSM STATION'

SEND PERIOD: This is the period when the logger sends the general info about station and the instant values information to the server. The value entered is in minutes and is between 0 and 9999.

Fig -9: 'SEND PERIOD' Screen



Control Bits: Control bits control SMS message sending, SMS responses and ara GSM mode server commands to the server computer. If the boxes are full they are active, if it is not passive. If you skip the column with the Enter key, the inside of the boxes can be changed with the up key.

Fig -10: Control Bits

S1, S2, S3 bits: Used to send sms messages to phone numbers entered. The phone numbers of the persons whose SMS message will be sent are shown in Figure-5.

P1, P2 bits: Used to send the instant values and status information on the Logger Device to PC computers, PC1 and PC2.

SR: Used to send SMS messages and send SMS messages. If the modem is passive it receives SMS message but does not reply again as SMS message.

GS: This bit is activated if you want to work as a GSM modem. If this bit is active, Data can only respond to calls and does not respond to incoming calls via the Internet.

APN NAME : Acsees Point is the name of the modem required to enter the internet. The APN name differs for each network. This APN name can be learned from the service/simcard provider of the sim card to be installed. A total of 14 characters can be entered in numeric, characters, small and capital letters.

Fig -11: 'APN NAME' Screen

USER NAME : This is the user name required for the modem to enter the internet. The user name and password can also be given when a special APN is requested from the service/simcard provider. If not requested, this place is left blank. Only the APN name may be sufficient for the device to enter the Internet. A total of 14 characters can be entered in numeric, characters, small and capital letters.

Fig -12: 'USER NAME'

PASSWORD : t is the password required for the modem to enter the internet. Used with user name. If requested from the service/simcard provider, the password is written. If it is not requested, it is left blank. Only the APN name may be sufficient for the device to enter the Internet. A total of 14 characters can be entered in numeric, characters, letters.

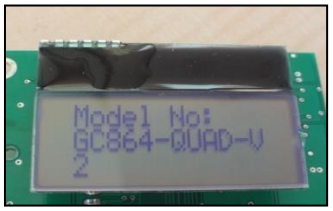
Fig -13: 'PASSWORD'

2.2.Modul Info

This menu contains information about the module. The values in this menu are for visual purposes only and cannot be changed.

Serial No : GSM module Serial number

Fig-14: Serial Number Screen



Model No : GSM module Model number

Fig -15: Model No

Mark Name : Manufacturer name of GSM module

Fig -16: Mark name

Version No : Software version of the GSM module

Fig -17: Version no

Imei No : IMEI number of GSM module

Fig -18: Imei No

3. MODEM START-UP

When the first power is supplied to the modem, the menu is shown on the LCD as shown in Figure-19. The version number depends on the model of the connected logger device.

AkiLGPRS-Vxx : Modem communicates with OEL-104.

AkPLVGPRS-Vxx : Modem communicates with Pluviograph.

ALogGPRS-Vxx : Modem communicates with Mini Data Logger, Radar ve PLT data loggers.

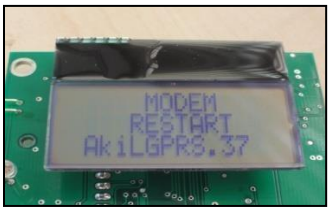
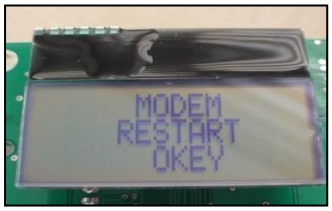
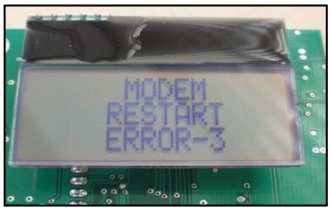


Fig-19: First Screen of the Modem

After this display menu, 'Modem Restart' is shown on the screen as shown in Figure-19 and the green lamp starts to flash. At the same time, the red lamp also starts to burn once in a while. The red lamp indicates that information is sent to the network. When Modem Restart is done, OKEY appears at the bottom of the screen. If the ERROR message is displayed, the modem is not switched on and the green lamp is not illuminated. The system automatically resets itself. After the system establishes a connection to the network, OKEY message is displayed and the green lamp starts flashing at short intervals. If the green lamp illuminates periodically, the modem will continue to operate and start to install itself. You can follow the messages on the screen to see if the modem is switched on and connected to the network. If the modem is in GPRS mode as shown in Figure-22, the main screen in Figure-23 will be displayed after the modem has installed itself. If the modem is in GSM mode, the display shows GSM mode. In GPRS mode, the display updates itself every minute. In this update, the modem checks the IP number and whether it exits the server mode and updates the display. If the display shows server, the modem is ready to be connected by the computer.





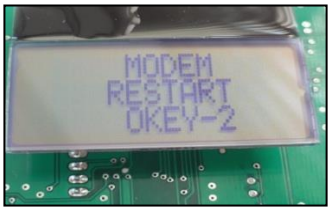


Fig-20, Fig-21, Fig-22: 'OKEY', 'EROR-3', 'OKEY-2' Massages

If the main screen responds to all commands with ı OKEY ', the LCD screen will be displayed. If this message is displayed, the modem is ready. If the GSM MODE message is displayed on the screen, the modem is ready to be connected.

Fig-23: '! SERVER !' Massages

3.1 The Meaning of OKEY and ERROR Messages

OKEY-1: The modem has received its first command and communication with the modem is complete.
ERROR-1: The module is defective. The green light of the modem is not blinking when the message is received.

OKEY-2: The modem is ready to receive SMS messages. SIM card is ready to receive SMS.

ERROR-2: Sim card is not active for receiving for SMS.

OKEY-3: The modem has established the connection with the network and has received the initial data from the network.

ERROR-3: The sim card installed in the modem is not connected to the network or the sim card is not registered to the network. The green light of the modem is flashing for long periods.

OKEY-4: Sım card ready to send SMS.

ERROR-4: The modem does not send SMS messages. You must contact the Sim Card provider.

OKEY-5: Installation information about the modem SMS message has been prepared.

ERROR-5: The setup information for the modem SMS message could not be prepared.

OKEY-6: AT commands are allowed according to the module version.

ERROR-6: AT commands are not allowed according to the module version. Communicate with

AKIM Technical Service.

OKEY-7: Modem is able to access network information. (Network name, GPRS status and Network quality etc.)

ERROR-7: Modem The network information has not been accessed. There is a problem with the network connection (network name, GPRS status, and network quality, etc.). Communicate with Sim Card Provider.

OKEY-8: The modem accepts the setup information, APN name, User name and password required to connect to the internet.

ERROR-8: The APN name is incorrectly entered. Check these values and turn the modem off and on again.

OKEY-9: The modem has entered the Internet and has received the IP number from the network. The modem is ready for use.

ERROR-9: The sim card is not registered.

3.1. SMS

"Msg. Reply" This means that information from the modem is requested by SMS and the modem responds to this request. If user sends SMS writing RESET, the modem resets itself. If user sends Akim level or AKIM LEVEL as a message the instant value and station information are sent by modem.

Fig-24: Info. Requested by SMS

The content of the SMS message to be sent depends on the logger device. The SMS messages to be sent to the devices are listed below. Write messages in quotation and send sms messages to the modem phone number.

PLV Cihazı (AkPLVGPRS-Vxx) : "Akim yagis" "AKIM YAGIS" "Akim Rain" "AKIM RAIN"

OEL-104 (AkiLGPRS-Vxx) : "Akim level" "AKIM LEVEL"

PLT, Radar, Mini Data Logger (ALogGPRS-Vxx): "Akim" "AKIM" "Reset" "Ac" "Kapa"

It means that TCP / IP(user computer) or data call is made and connected to the modem.

Fig-25: PC-ToConnect Screen

3.2.Message Types Sent by Modem

When SMS messages are sent to GPRS modems, SMS messages are sent according to the model of data logger. If the modem is not connected to the Logger devices or if there is a problem with the loggers, the SMS to the user gets the "Data Logger Note Active" message. Incoming SMS responses include logger information such as instantaneous values, current

time / hour, station number, station name, region. The IP address of the modem and the port number information comes as an SMS reply.

“AC” message must be sent to enable the relay's output, for disable KAPA message must be sent.

PLV (AkPLVGPRS-Vxx) :

AKIM Pluviograph Bolge=021 Havza =021 Istasyon=087 Birim:0.2mm Toplam Yagis=00000020 mm RTC=03/11/12 15:38:13 IP NO:188.xxx.xxx.xxx-80

Limnigraf Cihazı (AkiLGPRS-Vxx) :

AKIM LIMNIGRAF Zone=021 Observation =021 Station=087 Level=0082 cm RTC=03/11/12 15:38:13 IP NO:188.xxx.xxx.xxx-80

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