FALCOM
WIRELESS COMMUNICATIONS GMBH

Phantom

Hardware description (brief)

Preliminary/Draft

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Index of contents

Version history:

Version number	Author	Changes
1.00	Fadil Beqiri	- Initial version

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0 INTRODUCTION

0.1 General

This description is focused on the GSM/GPRS and GPS unit Phantom from FALCOM GmbH. It contains short information about purpose and use of the Phantom concept. This guide completes information needed to prepare and build applications incorporating the Phantom unit.

The Phantom unit is a Tri-band GSM/GPRS engine that works on the three frequencies GSM 850/1800/1900 MHz. The integrated GPS receiver architecture based on the SiRFstarIII chipset provides more then enough precise location information using satellite signals to enable to track objects where the Phantom unit is installed anywhere in the United States, Canada and Mexico. With its integral housing, compact design and ultra-low power consumption, powered by a rechargeable (3.7V/850 mAh) battery it is an outstanding quality, high-performance, operating as a stand alone unit. The configurable internal firmware is a fundamental component which in combination with the excellent hardware performance makes the Phantom unit to be on the top of applications where the fleet management and objects safety and security today are required. The Phantom unit consists of the GSM/GPRS engine, 20-chanel GPS receiver, IEEE 802.15.4, Bluetooth™ class 2 and a 3-D motion detector (allowing it to run in low power and Alarm mode) as an all-in-one solution.

Figure 1: View of PHANTOM unit

The embedded Class 2 Bluetooth™ transceiver is capable of communicating with any Serial Port Profile Bluetooth™ device, within a 10m radius. The Phantom in communication with your installed GPS Mapping software on the Bluetooth™-enabled device points you the way comfortably and reliably from the current location A to your desired destination B. The phantom allows you to navigate freely without the hassle of messy wire connections.

A compact "stacked FLASH/SRAM" device stores the PHANTOM software in the flash memory section of the GSM/GPRS part, and the static RAM section provides the additional storage capacity required by GPRS connectivity.

0.2 Circuit concept

The PHANTOM architecture includes the following major functional components:

- **ARCHITECTURE INTEGRATES:**
  - ✓ high-performance Tri Band GSM/GPRS core (operating at 26MHz)
  - ✓ 20 parallel channel low-power GPS core (operating at L1 1575.42 MHz and C/A code 1,023 MHz chip rate)
  - ✓ ARM7TDMI Processor (at speed 25MHz) that controls all functions of the system
  - ✓ Bluetooth connectivity
  - ✓ Integrated IEEE 802.15.4 wireless module (ZigBee Ready) for communication with Kefob
  - ✓ 3D detector system (MSENS module)
  - ✓ Power Control for Li-Ion Batteries
  - ✓ Combo-Memory (2MB - 512KB) for loading software.
- **PHYSICAL INTERFACES:**
  - ✓ 8-wires for user applications.
  - ✓ internal SIM card reader
  - ✓ GSM/GPRS antenna connector
  - ✓ GPS antenna connector

0.3 Package contents

Check the contents of the package. The following items should be included. In case of damaged or missing any item, please contact your dealer immediately.

Units	Quantity
Phatom Unit	1
FAL-ANT-005 (GSM/GPS)	1
FAL 700/3.7 (rechargeable Li-Ion battery)	1
Keyfob	2
AAA Batteries	4

Table 1: Delivery package

0.4 Related documents

1. Phantom_software_2.1.X_command_set
2. SiRF binary and NMEA protocol specification;
   www.falcom.de/download/manuals/SiRF

1 SECURITY

IMPORTANT FOR THE EFFICIENT AND SAFE OPERATION OF YOUR GSM-MODEM, READ THIS INFORMATION BEFORE USE!

Your cellular engine Phantom is one of the most exciting and innovative electronic products ever developed. With it you can stay in contact with your office, your home, emergency services and others, wherever service is provided.

This chapter contains important information for the safe and reliable use of the Phantom unit. Please read this chapter carefully before starting to use the cellular engine Phantom.

1.1 General information

Your PHANTOM device utilizes the GSM/GPS standard for cellular technology. GSM is a newer radio frequency („RF“) technology than the current FM technology that has been used for radio communications for decades. The GSM standard has been established for use in the European community and elsewhere. Your PHANTOM is actually a low power radio transmitter and receiver. It sends out and receives radio frequency energy. When you use your modem, the cellular system handling your calls controls both the radio frequency and the power level of your cellular modem.

1.2 Exposure to RF energy

There has been some public concern about possible health effects of using a GSM modem. Although research on health effects from RF energy has focused for many years on the current RF technology, scientists have begun research regarding newer radio technologies, such as GSM. After existing research had been reviewed, and after compliance to all applicable safety standards had been tested, it has been concluded that the product is fit for use.

If you are concerned about exposure to RF energy there are things you can do to minimize exposure. Obviously, limiting the duration of your calls will reduce your exposure to RF energy. In addition, you can reduce RF exposure by operating your cellular modem efficiently by following the guidelines below.

1.3 Efficient modem operation

In order to operate your modem at the lowest power level, consistent with satisfactory call quality please take note of the following hints.

- If your modem has an extendible antenna, extend it fully. Some models allow you to place a call with the antenna retracted. However, your modem operates more efficiently with the antenna fully extended.
- Do not hold the antenna when the modem is „IN USE“. Holding the antenna affects call quality and may cause the modem to operate at a higher power level than needed.

1.4 Antenna care and replacement

Do not use the modem with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Replace a damaged antenna immediately. Consult your manual to see if you may change the antenna yourself. If

so, use only a manufacturer-approved antenna. Otherwise, have your antenna repaired by a qualified technician.

Use only the supplied or approved antenna. Unauthorized antennas, modifications or attachments could damage the modem and may contravene local RF emission regulations or invalidate type approval.

1.5 Driving

Check the laws and regulations on the use of cellular devices in the area where you drive. Always obey them. Also, when using your modem while driving, please pay full attention to driving, pull off the road and park before making or answering a call if driving conditions so require. When applications are prepared for mobile use they should fulfil road-safety instructions of the current law!

1.6 Electronic devices

Most electronic equipment, for example in hospitals and motor vehicles is shielded from RF energy. However, RF energy may affect some malfunctioning or improperly shielded electronic equipment.

1.7 Vehicle electronic equipment

Check your vehicle manufacturer's representative to determine if any on board electronic equipment is adequately shielded from RF energy.

1.8 Medical electronic equipment

Consult the manufacturer of any personal medical devices (such as pacemakers, hearing aids, etc.) to determine if they are adequately shielded from external RF energy.

Turn your PHANTOM device OFF in health care facilities when any regulations posted in the area instruct you to do so. Hospitals or health care facilities may be using RF monitoring equipment.

1.9 Aircraft

Turn your PHANTOM OFF before boarding any aircraft.

Use it on the ground only with crew permission.

Do not use it in the air.

To prevent possible interference with aircraft systems, Federal Aviation Administration (FAA) regulations require you to have permission from a crew member to use your modem while the plane is on the ground. To prevent interference with cellular systems, local RF regulations prohibit using your modem whilst airborne.

1.10 Children

Do not allow children to play with your PHANTOM device. It is not a toy. Children could hurt themselves or others (by poking themselves or others in the eye with the antenna, for example). Children could damage the modem or make calls that increase your modem bills.

1.11 Blasting areas

To avoid interfering with blasting operations, turn your unit OFF when in a "blasting area" or in areas posted: „turn off two-way radio". Construction crew often uses remote control RF devices to set off explosives.

1.12 Potentially explosive atmospheres

Turn your PHANTOM device **OFF** when in any area with a potentially explosive atmosphere. It is rare, but your modems or their accessories could generate sparks. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always, clearly marked. They include fuelling areas such as petrol stations; below decks on boats; fuel or chemical transfer or storage facilities; and areas where the air contains chemicals or particles, such as grain, dust or metal powders.

Do not transport or store flammable gas, liquid or explosives, in the compartment of your vehicle, which contains your modem or accessories.

Before using your modem in a vehicle powered by liquefied petroleum gas (such as propane or butane) ensure that the vehicle complies with the relevant fire and safety regulations of the country in which the vehicle is to be used.

1.13 Non-ionizing radiation

As with other mobile radio transmitting equipment users are advised that for satisfactory operation and for the safety of personnel, it is recommended that no part of the human body is allowed to come too close to the antenna during operation of the equipment.

The radio equipment shall be connected to the antenna via a non-radiating 50 Ohm coaxial cable.

The antenna shall be mounted in such a position that no part of the human body will normally rest close to any part of the antenna. It is also recommended to use the equipment not close to medical devices as for example hearing aids and pacemakers.

2 SAFETY STANDARDS

Your GSM/GPS unit complies with all applicable RF safety standards.

The embedded GMS/GPS unit meets the safety standards for RF receivers and the standards and recommendations for the protection of public exposure to RF electromagnetic energy established by government bodies and professional organizations, such as directives of the European Community, Directorate General V in matters of radio frequency electromagnetic energy.

3 TECHNICAL DATA

3.1 General specifications of PHANTOM unit

- ***Power supply:***
  - **S**upply voltage 12 VDC
- ***Power saving:***
  - **M**inimizes power consumption in SLEEP mode to 2 mA
- ***Bluetooth:***
  - **S**upports Bluetooth connectivity, Class 1.1 and 2.0
  - **B**luetooth™ range: 10 m
- ***IEEE 802.15.4:***
  - **S**upports IEEE 802.15.4 wireless connectivity (ZigBee Ready)
- ***MSENS:***
  - **S**upports 3-D motion detector
- ***Temperature range:***
  - **N**ormal operation: -20 °C to +55 °C.
- ***Physical characteristics:***
  - **S**ize: 55.6 mm x 100.6 x 23.6 mm
  - **W**eight: approx. 200 g
- ***Firmware upgrade***
  - ***PHANTOM*** firmware upgradeable over serial interface

3.1.1 Power consumption

POWER CONSUMPTION (to be defined)						
	Min	Typ	Max	Unit	Description	
GSM/GPRS engine						
Supply voltage		12		V	Voltage must stay within the min/max values, including voltage drop, ripple and spikes.	
Average supply current						
		TBD*		µA	POWER DOWN mode	
				mA	SLEEP mode @ DRX = 6	
GSM					MODE	BAND
		TBD*		mA	IDLE mode	GSM 850
						GSM 1800/1900
				mA	TALK mode	GSM 850
						GSM 1800/1900
GPRS		TBD*		mA	IDLE GPRS	EGSM 850
						GSM 1800/1900

				mA	DATA mode GPRS, (4 Rx, 1 Tx)	EGSM 850
						GSM 1800/1900
				mA	DATA mode GPRS, (3 Rx, 2 Tx)	EGSM 850
						GSM 1800/1900

* TBD = to be defined

Table 2: Power consumption of Phantom unit

3.2 Technical specifications of GSM/GPRS engine

- ***Frequency bands:***
  - **T**ri band: GSM 850, GSM 1800, GSM 1900
  - **C**ompliant to GSM Phase 2/2+
- ***GSM class:***
  - **S**mall MS
- ***Transmit power:***
  - **C**lass 4 (2 W) at EGSM850
  - **C**lass 1 (1 W) at GSM1800 and GSM 1900
- ***GPRS connectivity:***
  - **G**PRS multi-slot class 10
  - **G**PRS mobile station class B
- ***DATA:***

GPRS ⇒

  - **G**PRS data downlink transfer: max. 85.6 kbps (see table 3).
  - **G**PRS data uplink transfer: max. 42.8 kbps (see table 3).
  - **C**oding scheme: CS-1, CS-2, CS-3 and CS-4.
  - ***PHANTOM*** supports two protocols PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) commonly used for PPP connections.
  - **S**upports of Packet Switched Broadcast Control Channel (PBCCH) allows you to benefit from enhanced GPRS performance when offered by the network operators.

CSD ⇒

  - **C**SD transmission rates: 2.4, 4.8, 9.6, 14.4 kbps, non-transparent, V.110.
  - **U**nstructured Supplementary Services Data (USSD) support.

- ***SMS:***
  - **M**T, MO, CB, Text mode
  - **T**ransmission of SMS over GSM.

- ***SIM interface:***
  - **I**nternal reader supports 3 V SIM card
- ***Casing:***
  - **F**ully shielded
- ***External antenna:***
  - **C**an be connected via 50 Ohm antenna connector
- ***Internal GPS antenna:***
  - **O**n the bottom side of Phantom Unit
- ***Audio interfaces:***
  - **T**wo analogue audio interfaces
- ***Audio features:***

  Speech codec modes:
  - **H**alf Rate (ETS 06.20)
  - **F**ull Rate (ETS 06.10)
  - **E**nhanced Full Rate (ETS 06.50/06.60/06.80)
  - **A**daptive Multi Rate (AMR)
- ***Real time clock:***
  - **I**mplemented
- ***Internal memory:***
  - **S**tacked Flash/SRAM

3.3 Technical specifications of GPS receiver

- ***GPS features:***
  - **O**EM single board 20 channel GPS receiver, L1 1575.42 MHz, C/A code 1,023 MHz chip rate.
  - **G**PS receiver with SiRFstarIII chip set
  - **P**rocessor type ARM7/TDMI
- ***Accuracy:***
  - **P**osition 10 meters CEP without SA.
  - **V**elocity 0.1 meters/second, without SA
  - **T**ime 1 microsecond synchronized to GPS time
- ***DGPS Accuracy:***
  - **P**osition 1 to 5 meters, typical.
  - **V**elocity 0.05 meters/second, typical
- ***Datum:***
  - **W**GS-84.
- ***Sensitivity*:***

- **T**racking 16 dBHz.
- **H**ot Start 23 dBHz
- **W**arm Start 28 dBHz
- **C**old Start 32 dBHz

* The sensitivity value is specified at the correlator. On a GPS Evaluation Receiver using SiRFXTrac2 firmware with the supplied antenna, 32 dBHz is equivalent to -142 dBm or -172 dBW. Other board and antenna characteristics will vary.

❖ ***Acquisition Rate:***

- Cold start <45 sec, average

❖ ***Dynamic Conditions:***

- **A**ltitude 18,000 meters (60,000 feet) max.
- **V**elocity <515 meters/second (1000 knots) max.
- **A**cceleration 4 g, max.
- **J**erk 20 meters/second³, max.

❖ ***Casing:***

- **F**ully shielded

❖ ***Time – 1 PPS Pulse:***

- **L**evel CMOS.
- **P**ulse duration 100 ms
- **T**ime reference t the pulse positive edge
- **M**easurements Aligned to GPS second, ± μs

❖ ***Supported protocols:***

- NMEA Msg.: GLL, GGA, RMC, VTG, GSV, GSA
- Additionally: IOP, GSM, BIN and MOTION (supported by the internal firmware, see related documents [1])

❖ ***Memory:***

- Combo-Memory (2 MB Flash–512 KB SRAM)

❖ ***Crystal oscillator (TCXO) specification:***

Typical phase noise density	1 Hz offset	-57.0 dBc/Hz
Typical phase noise density	10 Hz offset	-88.0 dBc/Hz
Typical phase noise density	100 Hz offset	-112.0 dBc/Hz
Typical phase noise density	1 kHz offset	-130.0 dBc/Hz
Typical phase noise density	10 kHz offset	-140.0 dBc/Hz
Load sensitivity	± 10 % load change	0.2 ± ppm
Long term stability	Frequency drift over 1 year	0.5 to 2.0 ± ppm

4 APPLICATION INTERFACE

4.1 Description of the 8-pin row-connector

The power supply for the Phantom unit has to be a single voltage source of V_{VC+} = +12 VDC. It must be able to provide sufficient current in a transmit mode.

Figure 2: Pin assignment on the 8-pin row-connector

Colour	NAME	I/O	DISCRIPTION	LEVEL
Red	VC+ (PWR)	I	Power supply input (PWR). The power supply must be able to meet the requirements of current consumption in a Tx burst.	+12 V
Braun	GND	-	Ground	0 V
Blue	IGN	I	Ignition line	
Orange	Input 1	I	Not connected	
Yellow	RX	I	Serial interface for direct connection to the host PC (configuration, evaluation, receiving data and others). If not used leave open.	
Green	TX	O		
Lilac	Output 1	O	General propose Output	
Black	Output 2	O	General propose Output	

Table 3: Pin description on the 8-pin row-connector

4.2 Description of LED indicators

After that the Phantom unit is powered up, its actual status is displayed by five LED's on the front side of the Unit. The IEEE indicator (green), GSM indicator (yellow), Bluetooth indicator (Blue) and GPS indicator (orange) will light during the internal initialization. After initialization the IEEEindicator (green) will be switched off.

Figure 3: LED indicators

Phantom unit provides the following LED indicators		
Name	**LED mode**	**Function**
GSM (Yellow LED)	Off	Terminal is off or runs in SLEEP mode.
	600 ms On/600 ms Off	No SIM card inserted or no PIN entered, or network search in progress, or ongoing user authentication, or network login in progress.
	75 ms On/3 s Off	Logged to network (monitoring control channels and user interactions). No call in progress.
	75 ms On/75 ms Off/ 75 ms On/3 ms Off	One or more GPRS contexts activated.
	Flashing	Flashing Indicates GPRS data transfer: When a GPRS transfer is in progress, the LED goes on within 1 second after data packets were exchanged. Flash duration is approximately 0.5 s.
	On	On Depending on type of call: *Voice call:* Connected to remote party. *Data call:* Connected to remote party or exchange of parameters while setting up or disconnecting a call.
GPS (Orange LED)	ON	Terminal is searching for satellites. Terminal receives invalid GPS position, no GPS fix obtained.
	Flashing (4 sec. interval)	Start-up GSM error (i.e. no SIM card inserted or incorrect PIN configuration or is not ready for operation).
	Continually flashing	Valid GPS data are being received, terminal has obtained a GPS fix and ready for use.
IEEE	-	-

(Green LED)	-	-
MSENS (Red LED)	ON (1 second)	The system is set in the alarm mode (armed)
BLUETOOTH (Blue LED)	-	-
	-	-

Table 4: Modes of the LED's and associated functions

4.3 Interfaces for external GSM/GPS antennas

The Phanton provides two SMB (male-female)-connectors for external GSM and GPS antennas. External antennas can be used instead of the Phantom's internal GSM and GPS antennas. The operation of internal GSM and GPS antennas will be deactivated if event of externall connection is detected.

The figure below shows the position of GSM/GPS connectors.

Figure 4: View of the GSM/GPS antenna cable

Antenna Type	Connector type	Cable Length
GSM	SMB-Male	85 mm
GPS	SMB-Female	55 mm

Table 5: interfaces for external antenna(s)

4.4 Bi-Directional Keyfob, remote operation

The Keyfob gives you remote operation of your security Phantom system. This keyfob operates with the push of one button or button combination. It also gives you direct feedback on its operation with a blinking light as well as with voice prompts, so you can be sure that your security system is operating as you intended. The communication to the Phantom unit is based on the IEEE 802.15.4 wireless network systems.

Figure 5: Keyfob control with allocated Buttons and LEDs names

Buttons common functionalities

Items	Buttons overview	Using the marked Button(s)	Description/Functionalities
1	Button 1	B1	Tests the range of remote control
2	Button 2	B2	Sets the alarm active
3	Button 2	B2	If no alarm activated, activates the alarm, otherwise returnes activated alarm to inactive (see also Item 2).
4	Button 3	B3	Checks the status of the internal batteries
5	Button 1 + 3	B1+ B3	Switches the Keyfob on.
6	Button 1 + 3 + 2	B1+ B3 + B2	Switches the Keyfob and Black box off.
7	Button 1 + 2 + 3	B1+ B2 + B3	Pairs the Keyfob with Black box.

Table 6: Button description

LEDs lighting colours

Items	LEDs overview	LEDs marked	Colour of light
1	LED 1	L1	Orange
2	LED 2	L2	Red
3	LED 3	L2	Yellow

Table 7: LED description

Actions and Reactions of the Keyfob while performing activations

Items	Buttons	Actions generated by Key combination	Reaction Possibilities	Meaning
Short pressing = press the button for less then 2 seconds **Long pressing =** press the button for longer then 2 seconds				
1	B1	short pressing	while the B1 is pressed the L1 blinks one time, after the B1 is released, each of L1 and L3 blinks one time in sequence and two beep tones are respectively genereated,.	Indicates that the Black box and Keyfob are within the wavelength of communication systems.
2			simultaneously generates three beep tones, and three times blinking of L1 and L3.	Indicates that the Black box and Keyfob are out of the wavelength of communication systems.
3	B2	Long pressing	lights the L1 for longer than 2 seconds	Indicates that the alarm is set active (arm)
4		Within 6 seconds two times short pressing.	simultaneously generates two beep tones and two times blinging of L1.	Indicates that the activated alarm is returned to inactive (disarm) or no alarm is already set.
5	B3	Long pressing	lights the L1+L2+L3 while the B3 is pressed.	Indicates that the battery is full charged.
6			lights the L1+L2 while the B3 is pressed.	Indicates that the batteries is half-full charged, they can be recharged (if rechargeable).
7			lights the L1 while the B3 is pressed.	Indicates that the batteries reach the low level, they must be replaced or recharged (if rechargeable).
8	B1 + B3	Simultaneously the B1 and B3 short pressing.	-	Indicates that the Keyfob is switched on.
			simultaneously generates three beep tones, and three times blinking of L1 and L3.	Indicates that the Black box and Keyfob are out of the wavelength of communication systems or they are already not paired (enter the key number by using the HARLEY.KEY<index> parameter
9	B1+B3+(B2)	Simultaneously, press and hold the B1 and B3 for longer than 2 seconds. Release when the L1 and L3 light. Then the B2 long pressing.	the L2 lights untill the B2 is released.	Indicates that the Black box and Keyfob are shut down. The Black box will be shut down and set itself into one of sleep modes based on the user defined alarm (e.g. into SleepIgnition, SleepMotion, SleepAll or SleepWakeup supported by the SYSTEM action type).
10	B1+B2+B3	Simultaneously the B1, B2 and B3 long pressing.	causes lighting of L1, L2 and L3 in series (one LED after another in sequence)	Indicates that the Black box and Keyfob are paired (remote communication is set up and both devices are ready for use).
11	-	-	If the L1 and L3 light and a beep tone is generated as well as the L2 lights and Keyfob vibrates (in sequence, one after another, not simultaneously)	Indicates an incoming alarm sent by the Black box. To turn the Reaction off perform the action on the Item 12.
12	B2	Within 3 seconds two times short pressing	-	Turns off the incoming alarm.
13	-	-	If simultaneously are generated, a long beep tone (high to low tone) and L2 lights for a long time.	Indicates that the Black box and Keyfob are longer than 5 seconds out of the wavelength of communication systems. The Keyfob is going into the sleep mode.

Table 8: Description of Actions and Reactions

5 FIRST STEPS TO MAKE IT WORKS

5.1 Minimum set-up connection

This section describes the minimum hardware connection of Phantom unit to get started.

As a minimum, to set-up a connection between your PC and the Phantom, it is necessary to connect the following interfaces to operate the Phantom unit properly.

Figure 6: The minimum hardware interface of Phantom to get started.

- **SIM interface:** The Phantom uses a standard SIM card protected within the unit casing. The integrated SIM interface in the Phantom controls a 3 V SIM card. This interface is fully compliant with GSM 11.11 recommendations concerning SIM functions. The Phantom requires a small SIM card, which is provided by your mobile phone service provider. This contains the telephone number of Phantom you will use, as well as other customer information.
- **Serial Interface:** The Phantom unit provides a serial interface. The serial interface is provided with three-wire the RX, TX and GND. These pins are 3.3 V CMOS compatible. In order to use different voltage levels, an appropriate level shifters has to be used.

  E. g. in order to provide RS232 compatible levels use the 3 V compatible MAX3232 transceiver from Maxim or others based on the required levels. The GPS and debugging data will be transmitted through this interface.
- **Power:** The input power is also very important as far as the minimum and maximum voltage is concerned. The power supply of Phantom has to be a single voltage source of V+ at 12 VDC. The power supply has to be able to provide a sufficient current. Please, connect the GND pin to ground, and the V+ line to external power source properly. If they are correctly connected, the board is full powered and the unit begins delivering its GPS and debugging data.
- **Configuraton Tool:** The Phantom unit can be simply configured using the Windows™ **Hyperterminal** program. The Phantom can also be configured by using any other Terminal-Program. The example in sections below is based on the Windows™ **Hyperterminal**

program. Start the application software (**HyperTerminal**) which can be found in the following directory.

- ✓ Go to Start > Program > Accessories > Communication and click the **HyperTerminal** program.
- ✓ On the appeared screen assign the name for the current connection (e.g. "Phantom") and click OK.
- ✓ Then choose the correct COM Port on which the Phantom unit is connected as well as select the baud rate of (57000 bps, 8 bit, no parity bit, 1 stop bit) and click OK.
- ✓ For a detailed description, please, refer to the sepatated "Phantom_software_2.1.X_manual.pdf" document, chapter 7.