HB 1900
(Heartbeat 1900)
User's Manual

Copyright

Registered Trademark

HB 1900

The results of using information not mentioned in this manual or the risk of misunderstanding this document remain with the user.

The information in this manual is subject to change due to function enhancement, change of design, etc. If you want the modified manual or have any question on this manual, please contact us at:

R-tron America, Inc Address : 10977 Granada Lane, Suite #225

Overland Park, KS 66212

Tel : +1-913-593-5205

Revision History

Version	Date of revision	Reason for revision	Revision Description
V1.0	Sep.21.2005	The First Edition	
V1.1	Oct.05.2005	Second Edition	

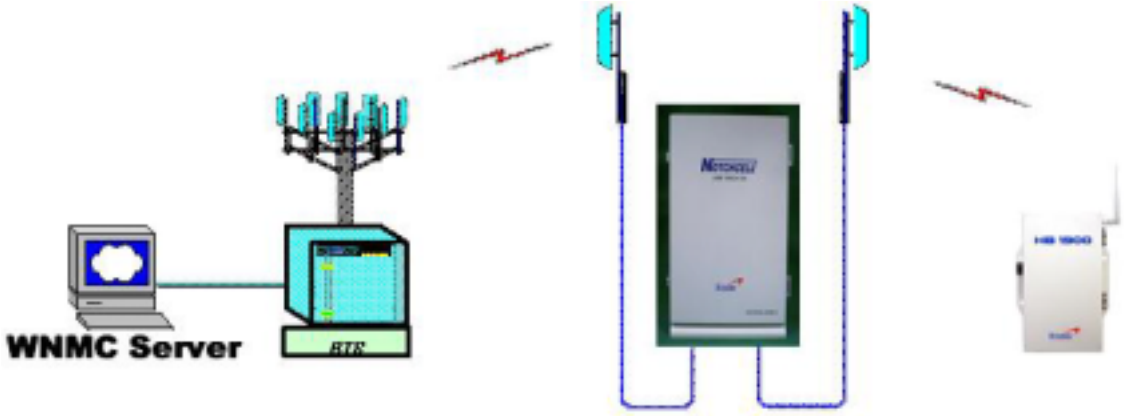
RF EXPOSURE INFORMATION

The antenna used for this transmitter must not exceed 2.5dBi and must be installed to provide a minimum separation distance of 20cm from all persons.

1. Overview

HB(Heart Beat)1900 is designed for the purpose of checking the repeater systems which were installed in Sprint network.

Using CDMA 1x modem protocol, heartbeat is happened only when the repeater system operates correctly. It traces the repeater status and give heartbeat signal periodically to WNMC server through SNMP Trap.



<Heartbeat transfer Configurations>

2. HB 1900 Description

2.1 HB 1900 Specification

2.1.1 Environmental conditions

Item	Standard	Remark
Power supply	85V~264V, 50/60Hz typ.	
Operating temperature	- 20 ~ +50℃	
Storage temperature	- 30 ~ +60℃	
Humidity	95 %	
Consumption power	15W	

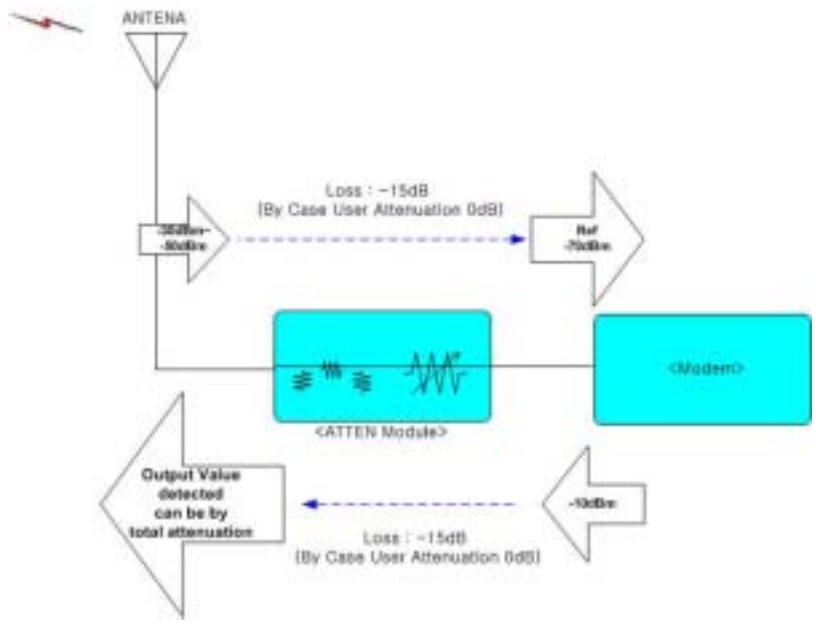
Table 1. Environmental Specification of HB 1900

2.1.2 System Specification

Item		Specifications	Remark
Frequency range	Down Link	1930 ~ 1990MHz	
	Up Link	1850 ~ 1910 MHz	
Heartbeat interval		3~59 min	
Interface Connector		RS-232C	
VSWR		≤1.5	
Atten Range		1~30dB	1dB Step
Atten Control Accuracy		±1.5dB	
Dimension(W*D*H)		170*300*74	Unit : mm
Weight		2.4kg	

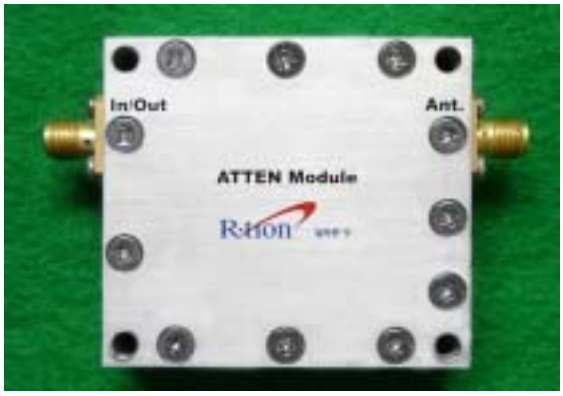
Table 2. features Specification of HB 1900

2.2 HB 1900 Block Diagram

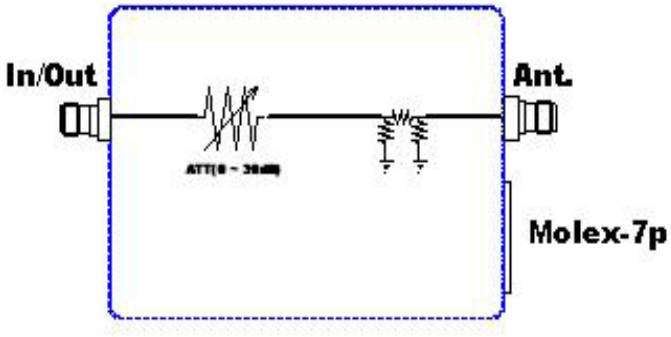


3. SUB Unit description & Specification

3.1 Attenuation Module



<Figure 1 Attenuation Module>



<Figure 2 Block diagram>

Attenuation Module function is sending signal to modem which is properly leveled and it sends Signal to repeater wirelessly, controlling modem output level.

*** Specification ***

Item		Specifications	Remark
Frequency range	Down Link	1930~1990 MHz	
	Up Link	1850~1910 MHz	
	Ant <-> In/Out Insertion Loss	-15dB ± 1dB	Frequency range (1850 MHz ~1990 MHz) @ ATT 0dB
Max Input Power	Ant Port	-10dBm	
	In/Out Port	20dBm(100mW)	
ATT Range		30dB / 1dB Step	Active Low
VSWR - S11,S22		1 : 1.3 Min	
RF Connector	Ant Port	SMA Female Type	
	In/Out Port	SMA Female Type	
Interface Connector		Molex 5264-7p	
Operating Temp.		-30℃ ~ +60℃	
Operating Voltage		DC 5V ± 0.5V	
Dimension(W*D*H)		60*90*30	Unit : mm

Table 3. Specification of Atten Module

3.2 Wireless Modem (Expedite C201)

<Figure 3 Wireless Modem>

Wireless Modem (Expedite C201) is designed for WNMC interconnection function

*** Specification ***

Item		Specifications	Remark
Frequency range	Down Link	1930 ~ 1990MHz	
	Up Link	1850 ~ 1910 MHz	
Storage Temperature		-30℃ to + 85℃	
Operating Temperature		-20℃ to +60℃	
RF Channel Bandwidth		1.25MHz	
Frequency Accuracy		±150Hz	
Operating Voltage		3.45V to 4.20V	
Maximum Output Power		100mW (20.0dBm)	
Dinamic Range		-104dBm ~ -64dBm	

3.3 SNMP Board

<Figure 4 SNMP Board>

The SNMP Board located in the HB 1900 cabinet which is the essential of the HB 1900.
The SNMP board contains powerful microprocessors.
Operational parameters, such as Heartbeat interval, Modem Attenuation, SNMP version, Site ID, etc. are set using a desktop or notebook and OMT, which communicate, locally via RS-232C cable, with the RRMS. Remote operation is performed via CDMA net

* **Connection ***

Port	Connected to
J1	SNMP Board Vcc
J4	Debugging port
J5	ATTEN Module Vcc & Control
D-SUB 9PIN	Local OMT

* **LED ***

LED	
TxD	Display communication status between Modem &SNMP Board
RxD	Display communication status between Modem &SNMP Board
OPR	Turn on a light in Heartbeat Range
RDY	Turn on a light when modem power is on

3.4 AC/DC Power Supply Unit

<Vendor 1>

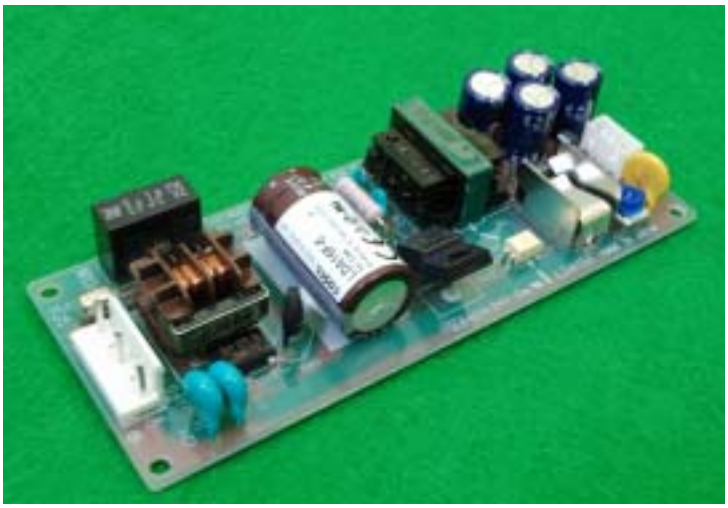
<Figure 5 AC/DC Power Supply Unit >

PSU receives and converts input power (AC 110V) into DC +5V.

*** Specification ***

Item		Specifications	Remark
Environmental	Operating Temp	-10℃~60℃	
	Storage Temp	-20℃~70℃	
	Humidity	20%~90%RH	
	Cooling method	Natural air	
Voltage		AC85~264V	
Current		3A Max / 5Vdc	
Frequency		47~440Hz max(50~60Hz typ)	
Leakage Current		0.5mA max.@110V AC	

<Vendor2>



* Specification *

Item		Specifications	Remark
Environmental	Operating Temp	-10℃~60℃	
	Storage Temp	-20℃~75℃	
	Humidity	20%~90%RH	
	Cooling method	Natural air	
Voltage		AC85~264V	
Current		3A Max / 5Vdc	
Frequency		47~440Hz	
Leakage Current		0.75mA max. 60Hz	

3.5 Antenna

<Figure 6 Antenna >

*** ELECTRICAL Specification ***

Item		Specifications	Remark
Frequency range	Down Link	1930 ~ 1990MHz	
	Up Link	1850 ~ 1910 MHz	
Max input power		5W	
VSWR		Less than 1.5:1	
Gain		2.0dBi±0.5	
Radiation pattern		Omni-directional	
Polarization		VERTICAL	
Antenna Type		Sleeve dipole	
Impedance		50 Ω	

*** MECHANICAL SPECIFICATIONS ***

Item	Specifications	Remark
Overall Length of Ant	166.5 ±2.0 mm	
Weight	30 g	
Temperature	-30℃~+70℃	
Cover material	Urethane (HI 153-9082) White COLOR	
Connector Type	SMA-Male	

4. Installation

4.1 How to install Program File

GUI program consists of one exe file. Therefore, you can copy one exe file to your PC and use it.

4.2 Connect communication cable

Connect communication cable as followings,

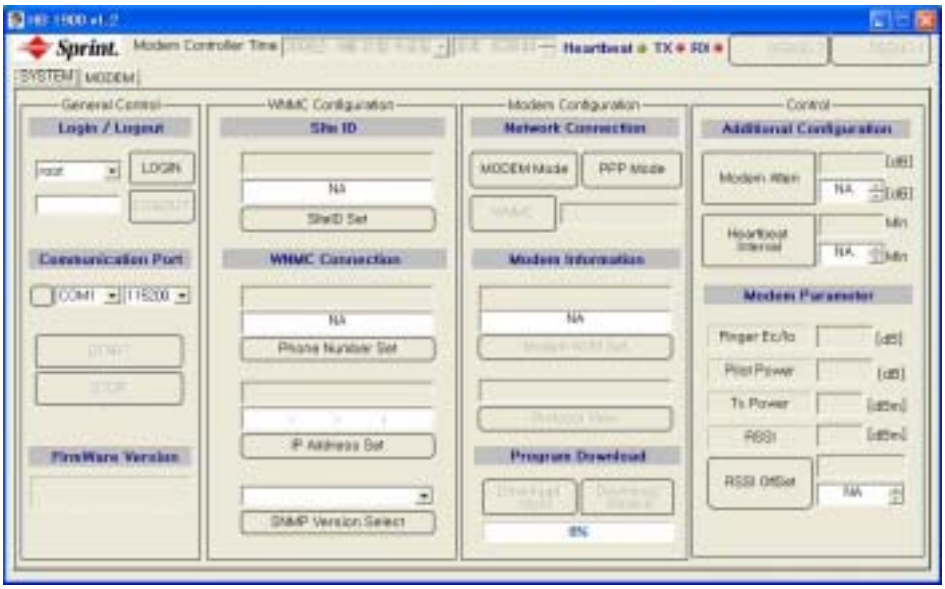
4.3 Power on

After connecting the communication cable, you can supply AC power to the HB 1900. As you can see the following picture, when you supply AC power to the HB 1900, the DC 5V LED light up one time. After 3 or 4 seconds later, the modem power(3.3Voltage) LED light up two times. Then 10 seconds later, the LED light three times. This signals that the heartbeat unit is ready for communication. Finally, you can execute GUI program and get the heartbeat communication started.

4.4 How to start GUI Program

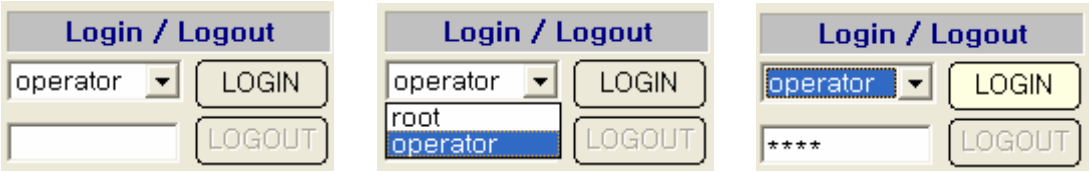
Click HB 1900 v1_2.exe.

When you click HB 1900 v1_2.exe, you will see the following pop-up window.



4.5 How to use and configure the Graphic User Interface (GUI)

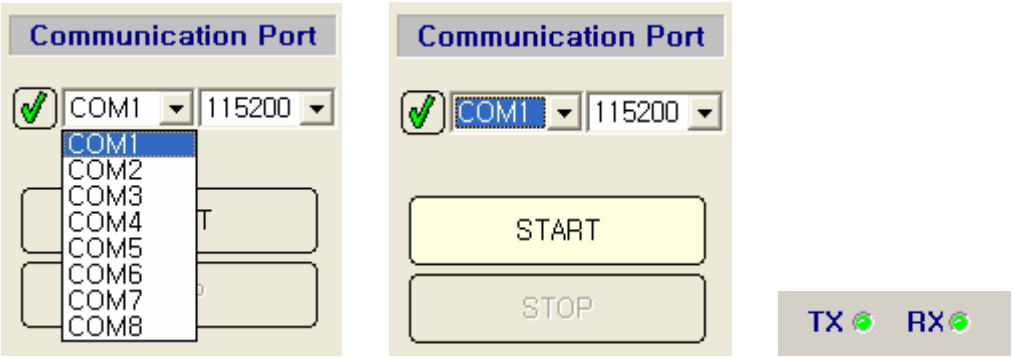
4.5.1 Login / Logout



To proceed using the GUI Program, a user should log-in.

There are two kinds of users. One is the‘root’ and the other is the‘operator’. The ‘root’ user, the can control all GUI buttons but the ‘operator’, can not use debugging pop-up window. Input classified user IDs(‘root’ or ‘operator’) and assess password. After that,all default buttons will be activated.

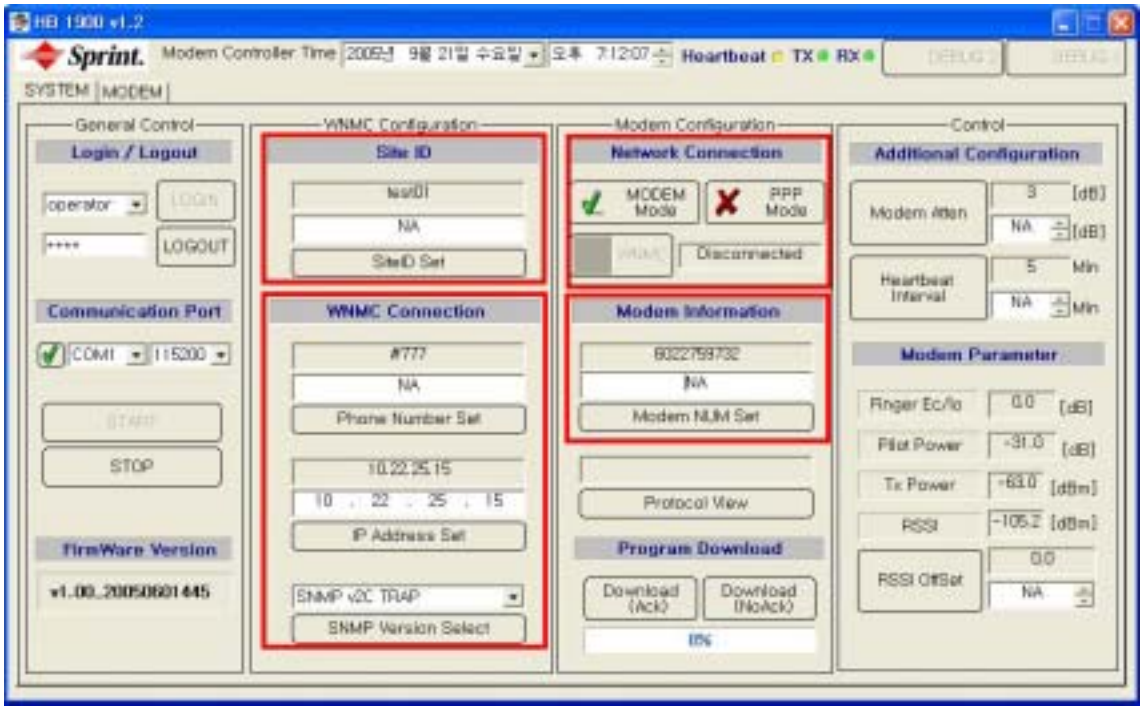
4.6 How to set up a communication port



After setting up the GUI Login, you should set up the communication port between the system

and GUI. The Communication protocol is a RS-232C protocol between the SNMP board and the PC serial port which is set up by the GUI. The Current RCU transmit speed is fixed at 11,5200bps. As you can see in the above picture, you can select the proper COM port and then click the ‘START’ button. Now the RCU communication is started. If there is no problem with the communication, the Rx LED will light up green with the Tx and Rx lighting up green, alternately.

4.7 Check setting figures

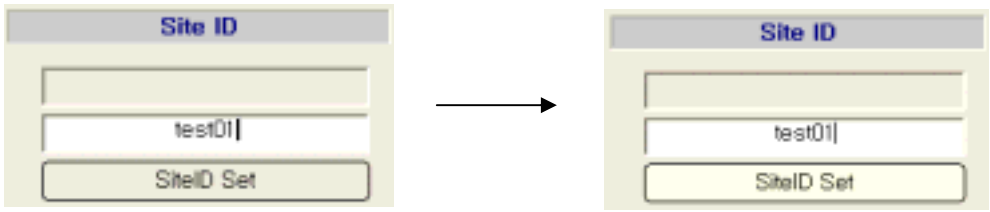


As shown in the above picture, you can check the Site ID(Cascade Code) , WNMC Phone Number , WNMC IP Address , SNMP Version and Modem Phone Number. When you change the current GUI settings, you can input the needed numbers in the white boxes and click toggle switch to store the values.

4.7.1 How to set Parameter value

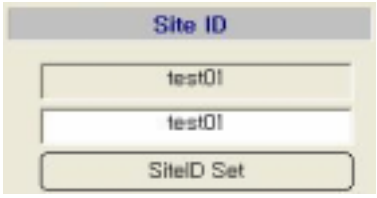
4.7.1.1 Cascade code Input

ex) Cascade Code which is given by a wireless operator : test01



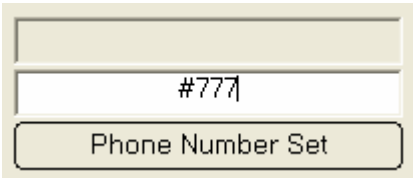
Type Cascade code in white activated box.

Click “SiteID Set” button.

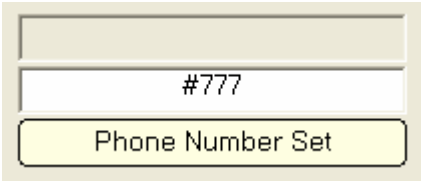


4.7.1.2 Input WNMC Phone Number

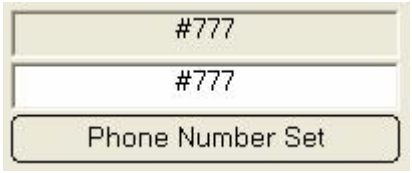
Sprint WNMC Phone Number is #777 and procedures is as followings,



Type “#777” in white activated box

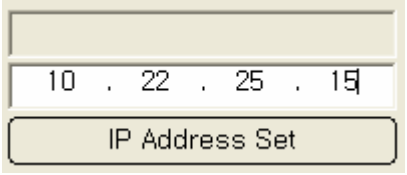


Click “Phone Number Set” button

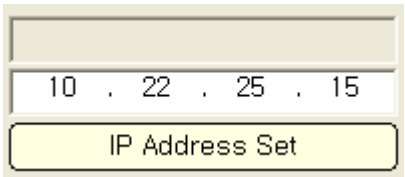


4.7.1.3 WNMC IP Address입력

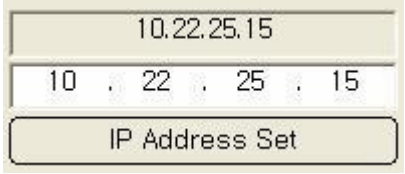
Sprint WNMC Server IP Address는 10.22.25.15 and procedures is as followings,



Type “10.22.25.15” in white activated box.



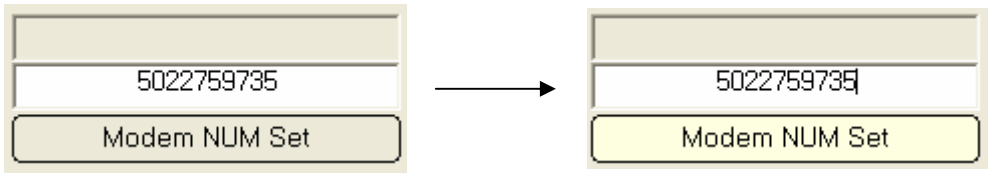
Click “IP Address Set” button.



4.7.1.4 Input Modem Phone Number

Type modem phone number which you are going to put it into HB 1900.

Each modem phone number is different.

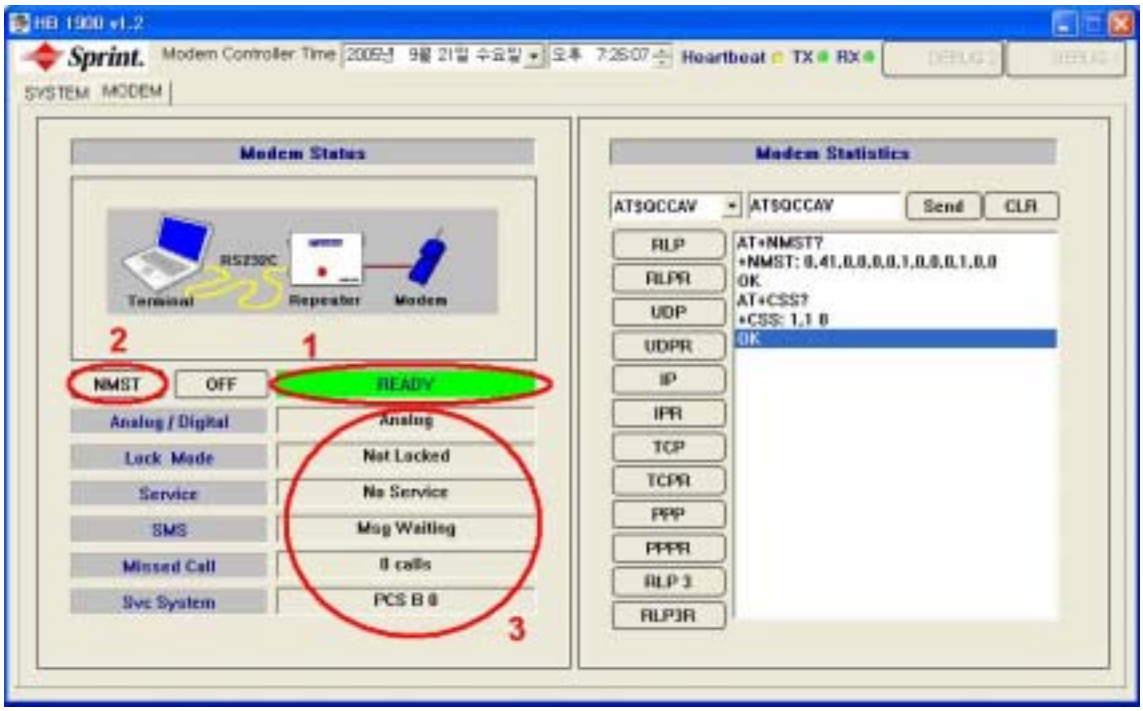


For example, when it comes to modem phone number is 5022759735, type this number in white activated box.

Click “Modem NUM Set”

2.4 How to check Modem

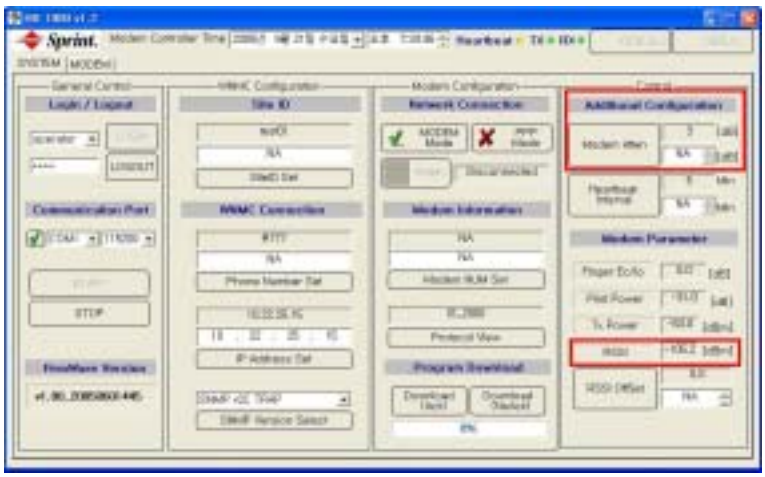
You can set the network connection status in ‘modem mode’ using the modem status pop-up window and entering information in the ‘modem statistics’ pop-up window as followings,



① When the Modem is properly connected, you will see ‘READY’ im green, like in the above picture[number 1].

② Then you can click the NMST button [number 2] and test the AT Command. When you see the ‘OK’ response, this means that the modem and SNMP board status is Okay.

2.5 Check RSSI Value and Set Attenuation



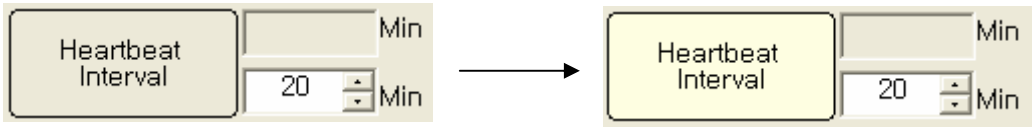
2.5.1 Set Attenuation

After check the RSSI value which is displayed on the GUI, set the RSSI value as -70dBm, using the modem attenuation. For example, when the GUI RSSI value is -67dBm, you can set it as -70dBm, using the modem attenuation 3dB. To set the attenuation, you can input the attenuation value in white box and then click the ‘modem atten’ button which is located on the left side to store it. (Ex-factory setting value of HB 1900 : user attenuation is 12dB , Heartbeat interval is 5 minutes.)

Ex) How to set User Attenuation

Antenna input Level	Fixed Loss	User Attenuation	Reference RSSI Value
-30dBm	-15dB	-25 dB	-70dBm
-40dBm	-15dB	-15 dB	-70dBm
-50dBm	-15dB	-5 dB	-70dBm

2.5.2 Set Heartbeat Interval



Type heartbeat interval in white activated box.

(Heartbeat Interval Range : 3 ~59 min)

Click “Heartbeat Interval” button.

2.6 How to check PPP connection and heartbeat

Set heartbeat interval as 20 minutes and then change network connection status to ‘PPP Mode’.