User Manual
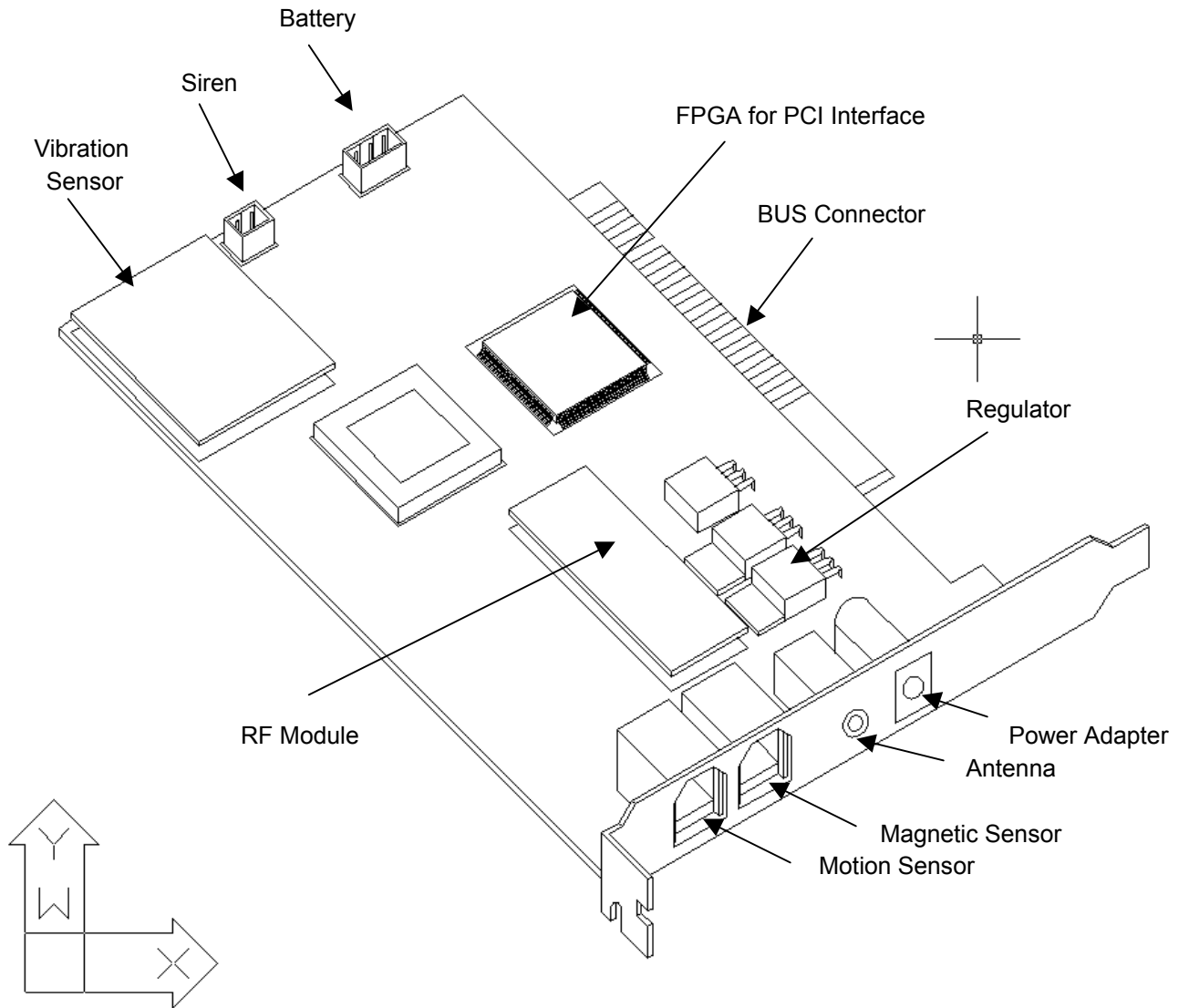
COMGUARD
(Model No.:CG-P100)

FCC NOTICE

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC FULES.

OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITION:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED,
   INCLUDING INTERFERENCE THAT MAY CAUSE UNDERSIRED
   OPERATION.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio

communication. However, there is no guarantee that interference will not occur in a

particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit difference from that to which
   the receiver is connected.

- Consult the dealer of an experienced radio/TV technician for help.

NOTE : The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Hardware Installation

Battery

Siren

FPGA for PCI Interface

BUS Connector

Vibration
Sensor

Regulator

RF Module

Power Adapter
Antenna

Magnetic Sensor
Motion Sensor

Hardware Specification

1. Board Specification

    1) CPU : AT89C51
        8 Bit Micro controller
        4 Kbyte Program Memory
        128 X 8 Bit Internal Ram
    2) Sensor Input (3 Input)
        Normal Close 2 Input
        Normal Open 1 Input
    3) Vibration sensor Input (1 Input)
        Sensitivity control volume: VR1
    4) RF remote control receiver
        Receiving remote control data and Reading data
    5) Communication Port
        Communicates through PC and PCI-Bus, does system setup for PC and transfers system
        condition of the machine
    6) Battery Backup
        12V / 400mA
        Maintains normal operation for 3hours in case of power failure
        Built-in circuit against overcharge and over discharge
    7) Power Supply unit
        DC 18V / 500mA Adapter
    8) PC power monitor
        Monitors PC power modes, on/off and operates following the system mode
    9) AC power monitor
        Monitors AC power failure and transfers the condition to PC
    10) Weight: 190g
    11) Environment condition
        Temperature: Operating   -5 ~ 55 ℃
                        Storage   -20 ~ 65 ℃
        Humidity: Operating   10% ~ 90% RH
                    Storage   5% ~ 95% RH

2. Adaptor Specification

    1) Name: AC Adaptor
    2) Input voltage: AC 110 / 220 V, 60Hz
    3) Output voltage: 18V (DC)
    4) Output current: 500mA
    5) Maximum rated capacity: 60VA
    6) Dimensions: 550mm X 800mm X 470mm
    7) Weight: 454g
    8) Length of output line: 1900m/m
    9) Indication of output polarity: ⊖━━━(•━━━⊕

3. Remote Control Specification

   1) Used frequency: 304MHz (single channel)
   2) Used voltage: 12V DC
   3) Operating Temperature : -10 ~ 50 ℃
   4) Used current: Below 15mA
   5) Dimensions: 32 x 48 x 12 mm
   6) Transmission Output: Below 5mW
   7) Frequency stability : Below ±100KHz
   8) Modulation method: A1D
   9) Oscillator method: LC oscillator method
   10) Ground method: self-cathode ground
   11) Transmission: 12 Bits, Ternary Data

4. Battery Specification

   1) Cell: Sealed Nickel Cadmium Cylindrical Cell
   2) Normal Capacity: 400 mAH
   3) Normal Voltage: 12.0 V
   4) Discharge End Voltage: 10.0 V
   5) Standard Charge: 40mA x 15 Hours
   6) Trickle Charge Current: 15~20mA
   7) Internal Impedance: 20 mΩ (Unit Cell)
   8) Temperature: Charging   0 ~ 45 ℃

                      Discharging   -20 ~ 60 ℃

                      Storage   -30 ~ 35 ℃
   9) Humidity: Max. 85%
   10) Weight: 140g (Approx.)
   11) Dimension: 56 x 70 x 14 mm
   12) Wire Length: 30 Cm

5. Siren Specification

   1) Min. Sound Pressure Level: 100dB at 12V / 100 Cm
   2) Rated Voltage: 12 V.
   3) Operating Voltage: 6 ~ 16 V.
   4) Max. Consumption: 150mA at 12V
   5) Tone Anture: Siren
   6) Temperature : Operating   -20 ~ 70 ℃

                      Storage   -30 ~ 75 ℃
   7) Weight: 56g
   8) Dimensions: 50 x 40 x 40 mm
   9) Wire Length: 41 cm

1.Comguard PCI Type Test Program

Test Program is simply designed for testing each features of Comguard PCI Type Board. The execution file is CGPTest.EXE located in CGP folerder. Comguard and Driver should be installed before running. Driver consists of Comguard.int in Driver\Win98 folder and Comguard.vxd.

Test Program is developed with Delphi 5. Recommended screen setting is 1024X768. All commands on protocol is controlled with one button for checking operation of each function. Original source files are also included for using developing reference.

In Test Program, shown in the next picture, you can confirm the correctness of each function through the left window, which shows the contents of input and output between computer and Comguard. There are buttons of each command in the right part to test them. You can control the setting values with selecting Spin Edit, Edit and Radio buttons.
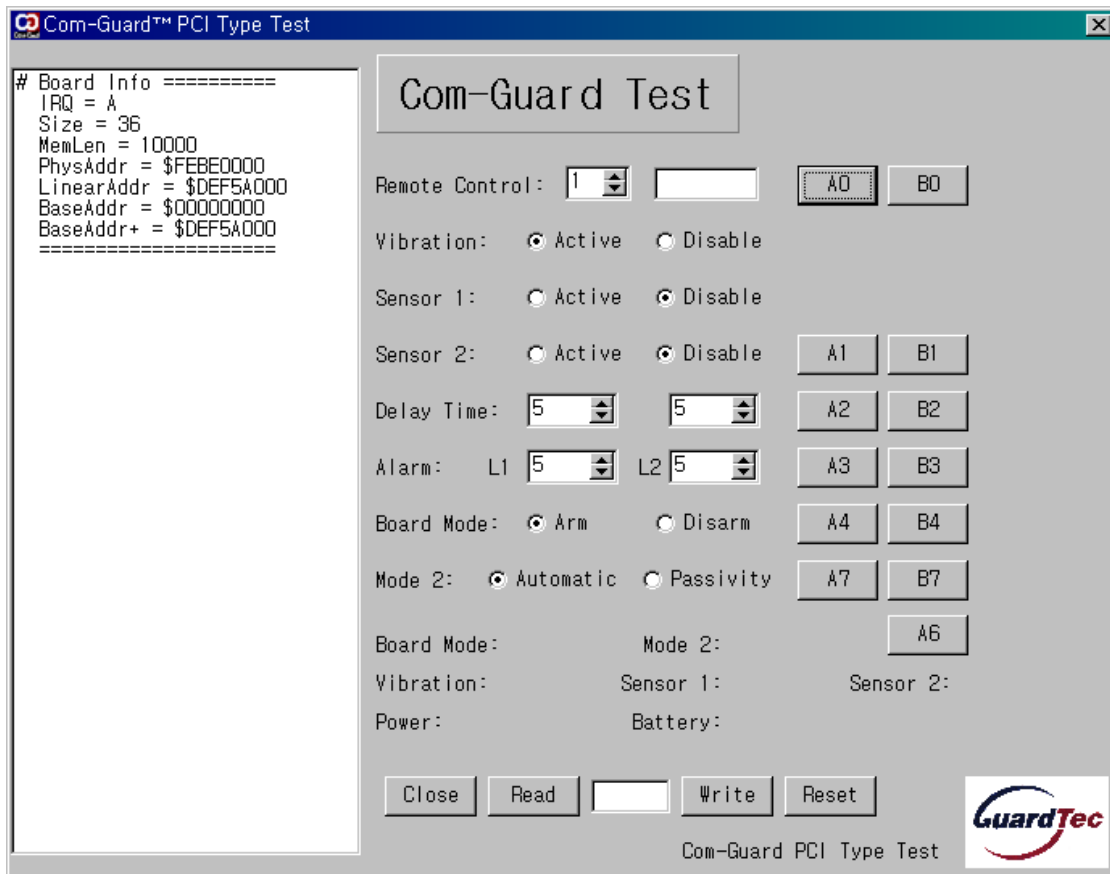
1) Inputting Remote Control numbers

'AO' is for inputting Remote Control numbers. You can select the order of Remote control numbers with left

'Spin Edit' to 5 as maximum value. You can input Remote control numbers with right 'Edit' to 6 as maximum value. After chosen the button, if the command is processed normally, 'Normaliry1' will be shown next to 'BO'. Otherwise you can see 'Abnormality' when it operated abnormally.


```
# Remote Control Key ==
PC -> Comguard :   2     → STX
PC -> Comguard :   A     → Length of command
PC -> Comguard : A0      → Command
PC -> Comguard :   1     → Order of Remote Control Number
PC -> Comguard :   1     → First position of Remote Control Number
PC -> Comguard :   2     → Second position of Remote Control Number
PC -> Comguard :   3     → Third position of Remote Control Number
PC -> Comguard :   4     → Fourth position of Remote Control Number
PC -> Comguard :   5     → Fifth position of Remote Control Number
PC -> Comguard :   6     → Sixth position of Remote Control Number
PC -> Comguard : AC      → Check Sum
PC -> Comguard :   3     → ETX

Comguard -> PC :   2
Comguard -> PC :   4
Comguard -> PC : BF      → Responded command after normal operation
Comguard -> PC :   6
Comguard -> PC : BD
Comguard -> PC :   3
====================
```

2) Inquiry of Remote Control Number

You can make an inquiry of the first order to saved Remote control numbers with 'BO'. 'A5' command sends an inquiry to 'AO' command. If inquiry number is identical to input number, you can see 'Normality2' next to 'BO'. If not, you can see only 'Abnormality'. Provided that saved Remote Control Number makes inquiry only to first order.


```
# A5(A0) Command ====
PC -> Comguard :   2     → STX
PC -> Comguard :   4     → Length of command
PC -> Comguard : A5      → Command
PC -> Comguard : A0      → Inquiry Command
PC -> Comguard :   1     → Check Sum
```

```
PC -> Comguard :   3     → ETX

Comguard -> PC :   2     → STX
Comguard -> PC :   A     → Length of command
Comguard -> PC : B0      → Command
Comguard -> PC :   1     → Order of Remote Control Number
Comguard -> PC :   1     → First position of Remote Control Number
Comguard -> PC :   2     → Second position of Remote Control Number
Comguard -> PC :   3     → Third position of Remote Control Number
Comguard -> PC :   4     → Fourth position of Remote Control Number
Comguard -> PC :   5     → Fifth position of Remote Control Number
Comguard -> PC :   6     → Sixth position of Remote Control Number
Comguard -> PC : BC      → Check Sum
Comguard -> PC :   3     → ETX
===================
```

3) Setting Sensor operation

You can set the operating sensor using 'A1'. Operating status of Vibration sensor,sensor1, sensor2 can be controlled by selecting 'Acting' or 'Disable'. If the command is processed normally, you can see 'Normality1' next to 'B1'. If not, you can see only 'Abnormality'.
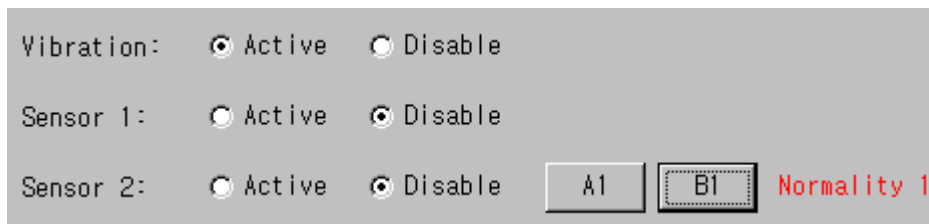

```
# Sensor Setting ======
PC -> Comguard :   2     → STX
PC -> Comguard :   6     → Length of command
PC -> Comguard : A1      → Command
PC -> Comguard : 45      → Vibration sensor(45: occupied, 44: unoccupied)
PC -> Comguard : 44      → Sensor 1(45: occupied, 44: unoccupied)
PC -> Comguard : 44      → Sensor 2(45: occupied, 44: unoccupied)
PC -> Comguard : E2      → Check Sum
PC -> Comguard :   3     → ETX

Comguard -> PC :   2
Comguard -> PC :   4
Comguard -> PC : BF      → Responded command after normal operation
Comguard -> PC :   6
Comguard -> PC : BD
Comguard -> PC :   3
===================
```

4) Inquiry of sensor operation

You can make an inquiry of the setting status of each sensor with 'B1'. 'A5' command sends an inquiry to

'A1' command to the setting status of Vibration sensor, sensor1 and sensor 2. If inquiry is identical to setting, you can see 'Normality2' next to 'B1'. If not, you can see only 'Abnormality'. Provided that sensor1 and sensor2 can be affected by the setting of delaying time of sensor operation.
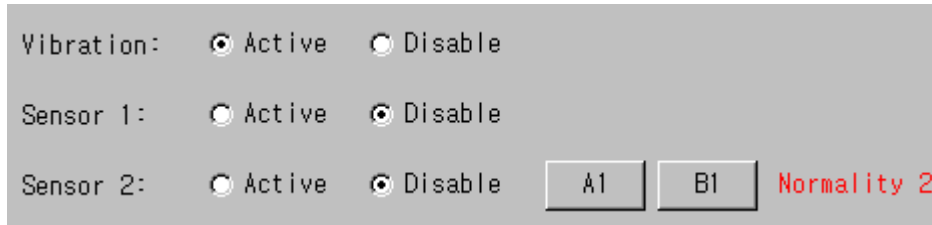

```
# A5(A1) Command ====
PC -> Comguard :   2    → STX
PC -> Comguard :   4    → Length of command
PC -> Comguard : A5     → Command
PC -> Comguard : A1     → Inquiry command
PC -> Comguard :   0    → Check Sum
PC -> Comguard :   3    → ETX

Comguard -> PC :   2    → STX
Comguard -> PC :   6    → Length of command
Comguard -> PC : B1     → Command
Comguard -> PC : 45     → Vibration sensor(45: occupied, 44: unoccupied)
Comguard -> PC : 44     → Sensor 1(45: occupied, 44: unoccupied)
Comguard -> PC : 44     → Sensor 2(45: occupied, 44: unoccupied)
Comguard -> PC : F2     → Check Sum
Comguard -> PC :   3    → ETX
===================
```

5) Setting delay time of Sensor operation

   You can set delay time of alarming after sensing with 'A2'. Entering delay time is spare time for Administrator to enter and modify arm status to disarm status after sensor 1 or 2 perceived. You can choose delay time of administrator entering time with left 'Spin Edit'. Leaving delay time can be set for sensor1 or sensor2 to be disable when administrator leaving after setting arm status. You can choose delay time of administrator leaving delay time with right 'Spin Edit'. If the command is processed normally, you can see 'Normality1' next to 'B2'. If not, you can see only 'Abnormality'.


```
# Delay Time =========
PC -> Comguard :   2    → STX
PC -> Comguard :   5    → Length of command
```

```
PC -> Comguard : A2    → Command
PC -> Comguard :  5     → Entering delay time
PC -> Comguard :  5     → Leaving delay time
PC -> Comguard : A7    → Check Sum
PC -> Comguard :  3     → ETX

Comguard -> PC :  2
Comguard -> PC :  4
Comguard -> PC : BF    → Responded command after normal operation
Comguard -> PC :  6
Comguard -> PC : BD
Comguard -> PC :  3
==================
```

6) Inquiry of delay time of sensor operation

You can make an inquiry of delay time setting with 'B2'. 'A5' command sends an inquiry to 'A2'. If the inquiry is identical to setting, you can see 'Normality2' next to 'B2'. If not, you can see only 'Abnormality'.

```
Delay Time:  [5]  [↕]   [5]  [↕]    [ A2 ]  [ B2 ]  Normality 2
```

```
# A5(A2) Command ====
PC -> Comguard :  2     → STX
PC -> Comguard :  4     → Length of command
PC -> Comguard : A5    → Command
PC -> Comguard : A2    → Inquiry command
PC -> Comguard :  3     → Check Sum
PC -> Comguard :  3     → ETX

Comguard -> PC :  2     → STX
Comguard -> PC :  5     → Length of command
Comguard -> PC : B2    → Command
Comguard -> PC :  5     → Entering delay time
Comguard -> PC :  5     → Leaving delay time
Comguard -> PC : B7    → Check Sum
Comguard -> PC :  3     → ETX
==================
```

7) Setting alarm time

You can set alarm time with 'A3'. There are two levels of alarm sound. First level sounds louder than second level. Each time of level can be set separately and entire alarm time is the sum total of each level time. You can select alarm time of first level with left' Spin Edit' and second level with right ' Spin Edit'. If the command is processed normally, you can see 'Normality1' next to 'B3'. If not, you can see only 'Abnormality'.

```
Alarm:   L1 [5]  [↕]  L2 [5]  [↕]    [ A3 ]  [ B3 ]  Normality 1
```

```
# Alarm =============
PC -> Comguard :   2     → STX
PC -> Comguard :   5     → Length of command
PC -> Comguard : A3      → Command
PC -> Comguard :   5     → First level alarm time
PC -> Comguard :   5     → Second level alarm time
PC -> Comguard : A6      → Check Sum
PC -> Comguard :   3     → ETX

Comguard -> PC :   2
Comguard -> PC :   4
Comguard -> PC : BF      → Responded command after normal operation
Comguard -> PC :   6
Comguard -> PC : BD
Comguard -> PC :   3
==================
```

8) Inquiry of alarm time

   You can make an inquiry of alarm time setting with 'B3'. 'A5' command sends an inquiry to 'A3'. If the inquiry is identical to the setting, you can see 'Normality2' next to 'B3'. If not, you can see only 'Abnormality'.
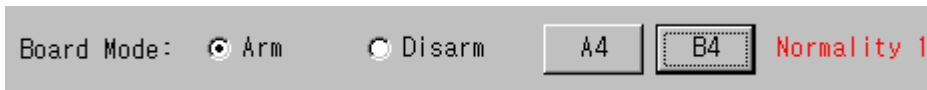


```
# A5(A3) Command ====
PC -> Comguard :   2     → STX
PC -> Comguard :   4     → Length of command
PC -> Comguard : A5      → Command
PC -> Comguard : A3      → Inquiry command
PC -> Comguard :   2     → Check Sum
PC -> Comguard :   3     → ETX

Comguard -> PC :   2     → STX
Comguard -> PC :   5     → Length of command
Comguard -> PC : B3      → Command
Comguard -> PC :   5     → First level alarm time
Comguard -> PC :   5     → Second level alarm time
Comguard -> PC : B6      → Check Sum
Comguard -> PC :   3     → ETX
==================
```

9) Setting Arm/Disarm mode

   You can set arm/disarm mode with 'A4' selecting mode between 'Arm' and 'Disarm'. If the command is processed normally, you can see 'Normality1' next to 'B4'. If not, you can see only 'Abnormality'.
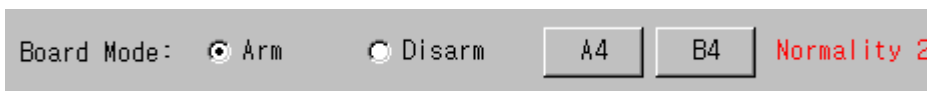
```
# Board Mode ========
PC -> Comguard :   2    → STX
PC -> Comguard :   4    → Length of command
PC -> Comguard : A4    → Command
PC -> Comguard : 47    → Setting arm/disarm mode
PC -> Comguard : E7    → Check Sum
PC -> Comguard :   3    → ETX

Comguard -> PC :   2
Comguard -> PC :   4
Comguard -> PC : BF    → Responded command after normal operation
Comguard -> PC :   6
Comguard -> PC : BD
Comguard -> PC :   3
===================
```

10) Inquiry of Arm/Disarm mode

You can make an inquiry of Arm/Disarm mode setting with 'B4'. 'A5' command sends an inquiry to 'A3'. If the inquiry is identical to the setting, you can see 'Normality2' next to 'B4'. If not, you can see only 'Abnormality'.
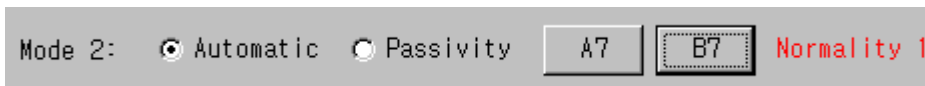


```
# A5(A4) Command ====
PC -> Comguard :   2    → STX
PC -> Comguard :   4    → Length of command
PC -> Comguard : A5    → Command
PC -> Comguard : A4    → Inquiry command
PC -> Comguard :   5    → Check Sum
PC -> Comguard :   3    → ETX

Comguard -> PC :   2    → STX
Comguard -> PC :   4    → Length of command
Comguard -> PC : B4    → Command
Comguard -> PC : 47    → Inquiry of Arm/Disarm mode
Comguard -> PC : F7    → Check Sum
Comguard -> PC :   3    → ETX
===================
```

11) Setting Automatic/Passivity mode

You can set Automatic/Passivity mode with 'A7' selecting mode between 'Automatic' and 'Passivity'. 'Automatic' mode sets Comguard operation automatically, when you turn off your computer. With 'Passivity'

mode, Comguard keeps the setting of Arm/Disarm mode after turning off the computer. You can control the Arm/Disarm mode with remote control while the computer is turned off regardless of Automatic/Passivity mode. If the command is processed normally, you can see 'Normality1' next to 'B7'. If not, you can see only 'Abnormality'.
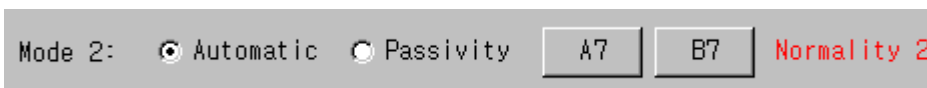
Mode 2: ⦿ Automatic ○ Passivity   [A7] [[B7]] Normality 1

```
# Mode 2 ============
PC -> Comguard :   2    → STX
PC -> Comguard :   4    → Length of command
PC -> Comguard : A7     → Command
PC -> Comguard : 41     → Setting Automatic/Passivity mode
PC -> Comguard : E2     → Check Sum
PC -> Comguard :   3    → ETX

Comguard -> PC :   2
Comguard -> PC :   4
Comguard -> PC : BF     → Responded command after normal operation
Comguard -> PC :   6
Comguard -> PC : BD
Comguard -> PC :   3
==================
```

12) Inquiry of Automatic/Passivity mode

   You can make an inquiry of Automatic/Passivity mode setting with 'B7'. 'A5' command sends an inquiry to 'A7'. If the inquiry is identical to the setting, you can see 'Normality2' next to 'B7'. If not, you can see only 'Abnormality'.

Mode 2: ⦿ Automatic ○ Passivity   [A7] [B7] Normality 2

```
# A5(A7) Command ====
PC -> Comguard :   2    → STX
PC -> Comguard :   4    → Length of command
PC -> Comguard : A5     → Command
PC -> Comguard : A7     → Inquiry command
PC -> Comguard :   6    → Check Sum
PC -> Comguard :   3    → ETX

Comguard -> PC :   2    → STX
Comguard -> PC :   4    → Length of command
Comguard -> PC : B7     → Command
Comguard -> PC : 41     → Inquiry of Automatic/passivity mode
```

```
Comguard -> PC : F2      → Check Sum
Comguard -> PC :   3     → ETX
==================
```

13)Inquiry of Diagnostic

   You can make an Diagnostic inquiry with 'A6'. If the value of Arm/Disarm mode is '47', it means Arm mode or '43' means Disarm mode. If vibration sensor, sensor1 and sensor2 indicates '44', it means your computer is turned on. If the value is '44', it indicates your computer is turned off now. Battery status will be upgraded in next version. If the command is processed normally, you can see each status in fixed position.



```
# Diagnostic =========
PC -> Comguard :   2     → STX
PC -> Comguard :   4     → Length of command
PC -> Comguard : A6      → Command
PC -> Comguard :   0     → Status Code
PC -> Comguard : A2      → Check Sum
PC -> Comguard :   3     → ETX

Comguard -> PC :   2     → STX
Comguard -> PC :   9     → Length of command
Comguard -> PC : B6      → Command
Comguard -> PC : 47      → Arm/Disarm mode status
Comguard -> PC : 4E      → Vibration sensor status
Comguard -> PC : 4E      → Sensor1 status
Comguard -> PC : 4E      → Sensor2 status
Comguard -> PC : 47      → PC Power status
Comguard -> PC : 46      → Battery status
Comguard -> PC : B7      → Check Sum
Comguard -> PC :   3     → ETX
==================
```

14) Arm event

   You can operate this event with selecting Arm mode with the remote control. This means arm mode and each sensor is disable. The difference between 'A6' command and the event is that the PC power status of 'A6'

changed DC power status of Comguard in the event. If DC power status indicates '47',it means DC power status. If the value is '45',the Comguard is not provided DC power. After the event occurred, you can see each status in fixed position.
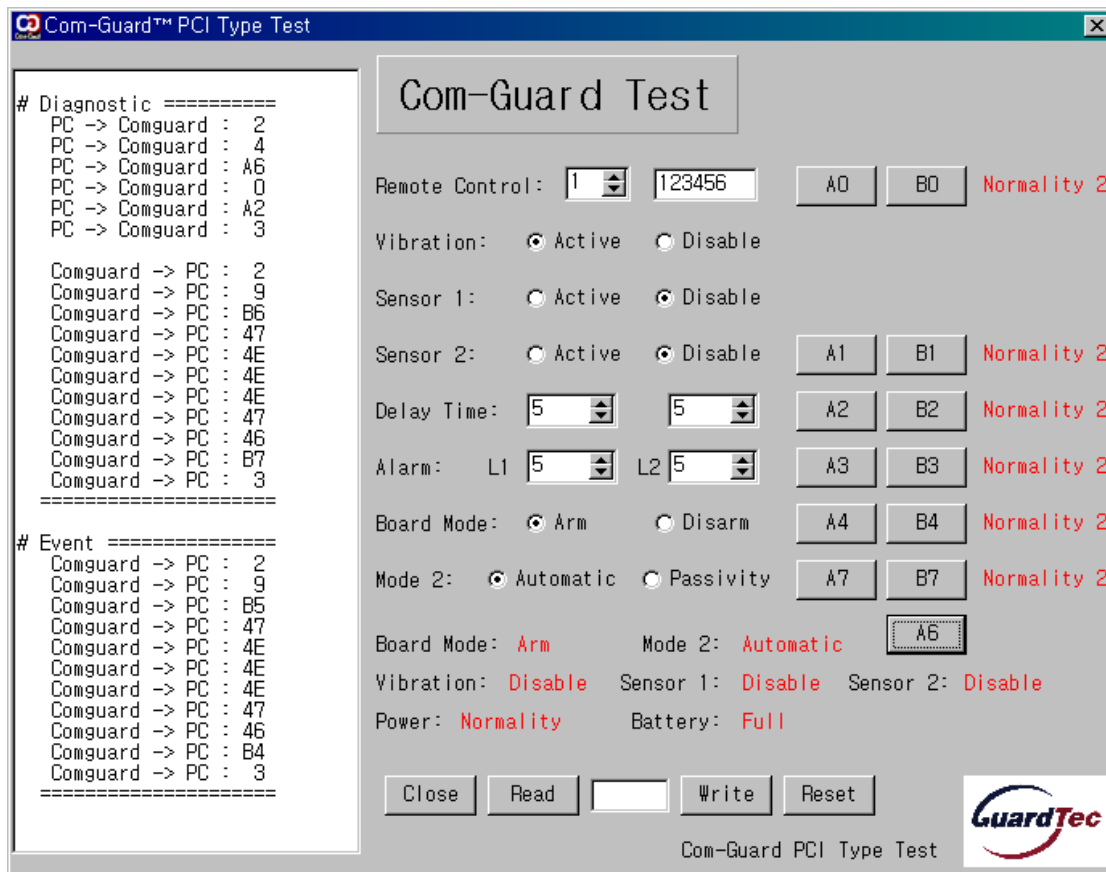

```
# Event =============
Comguard -> PC :  2    → STX
Comguard -> PC :  9    → Length of command
Comguard -> PC : B5    → Command
Comguard -> PC : 47    → Arm mode
Comguard -> PC : 4E    → Vibration sensor not perceived
Comguard -> PC : 4E    → sensor1 not perceived
Comguard -> PC : 4E    → sensor2 not perceived
Comguard -> PC : 47    → DC Power status
Comguard -> PC : 46    → Battery status
Comguard -> PC : B4    → Check Sum
Comguard -> PC :  3    → ETX
===================
```

15) Sensing vibration event

This event will occur after vibration sensor operated. It indicates the value of fifth item is '44'. You can see 'Sensing' with 'Vibration' in the tail of window.
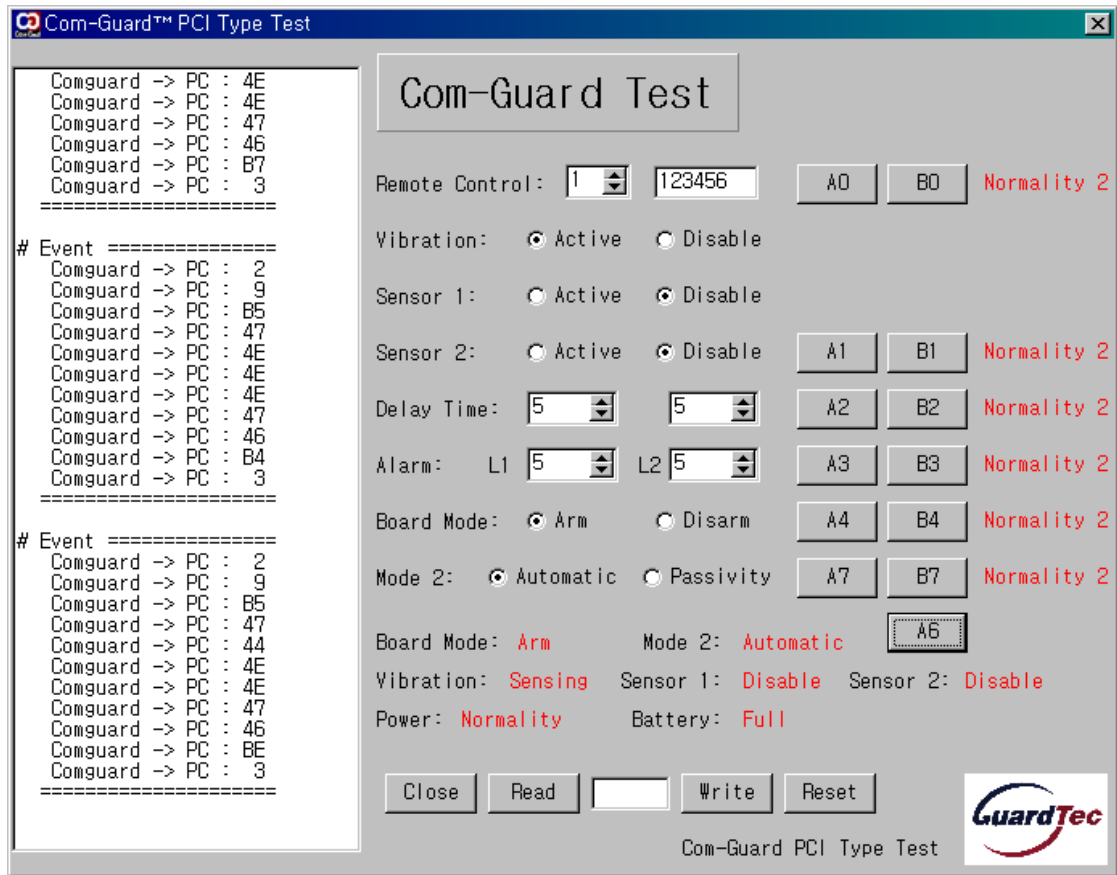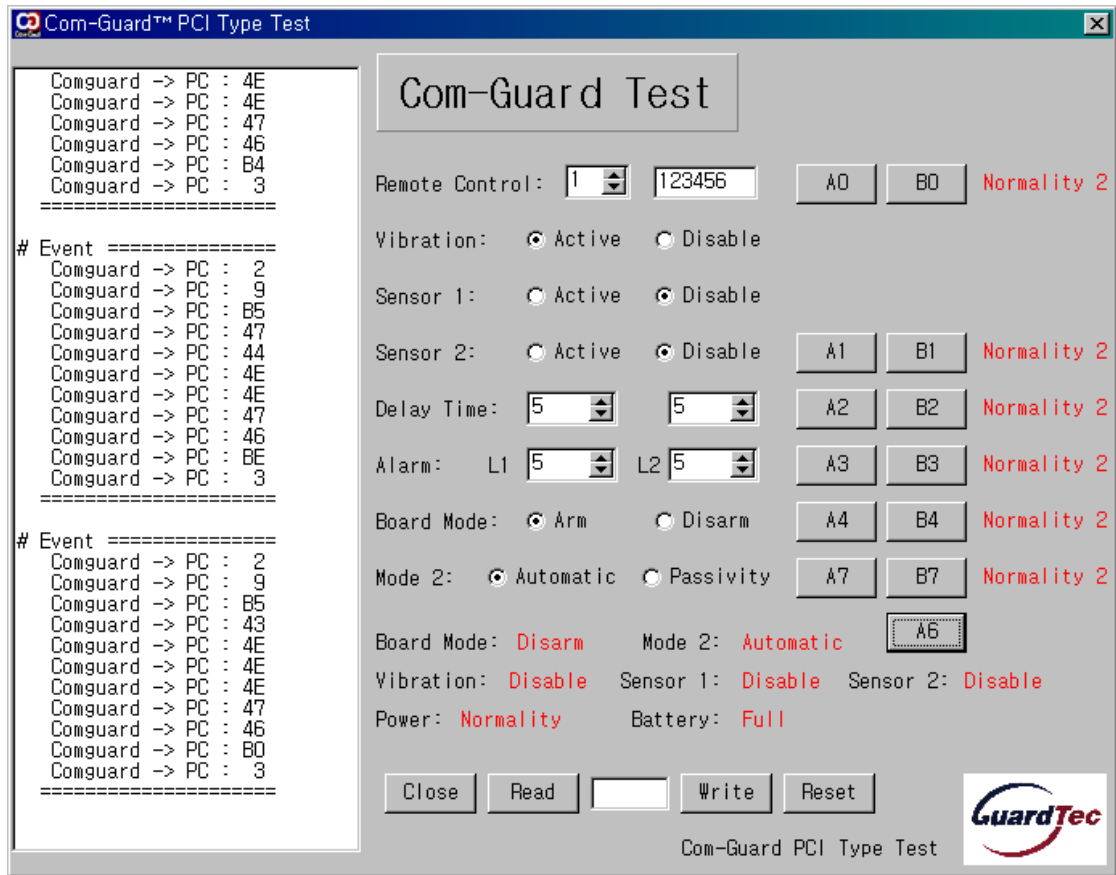
```
# Event =============
Comguard -> PC :   2      → STX
Comguard -> PC :   9      → Length of command
Comguard -> PC : B5      → Command
Comguard -> PC : 47      → Arm status
Comguard -> PC : 44      → Sensing Vibration sensor
Comguard -> PC : 4E      → Sensor1 disable
Comguard -> PC : 4E      → Sensor1 disable
Comguard -> PC : 47      → DC Power status
Comguard -> PC : 46      → Battery status
Comguard -> PC : BE      → Check Sum
Comguard -> PC :   3      → ETX
===================
```

16) Disarm event

   You can make this event by the remote control. After the event occurred, you can see each status in fixed position.

```
# Event =============
Comguard -> PC :   2      → STX
Comguard -> PC :   9      → Length of command
Comguard -> PC : B5      → Command
Comguard -> PC : 43      → Disarm mode
Comguard -> PC : 4E      → Vibration Sensor disable
Comguard -> PC : 4E      → Sensor1 disable
Comguard -> PC : 4E      → Sensor2 disable
Comguard -> PC : 47      → DC Power status
Comguard -> PC : 46      → Battery status
Comguard -> PC : B0      → Check Sum
Comguard -> PC :   3      → ETX
==================
```

17) MPU Reset and miscellaneous

   You can initialize the input and output status of Comguard with 'Reset'.
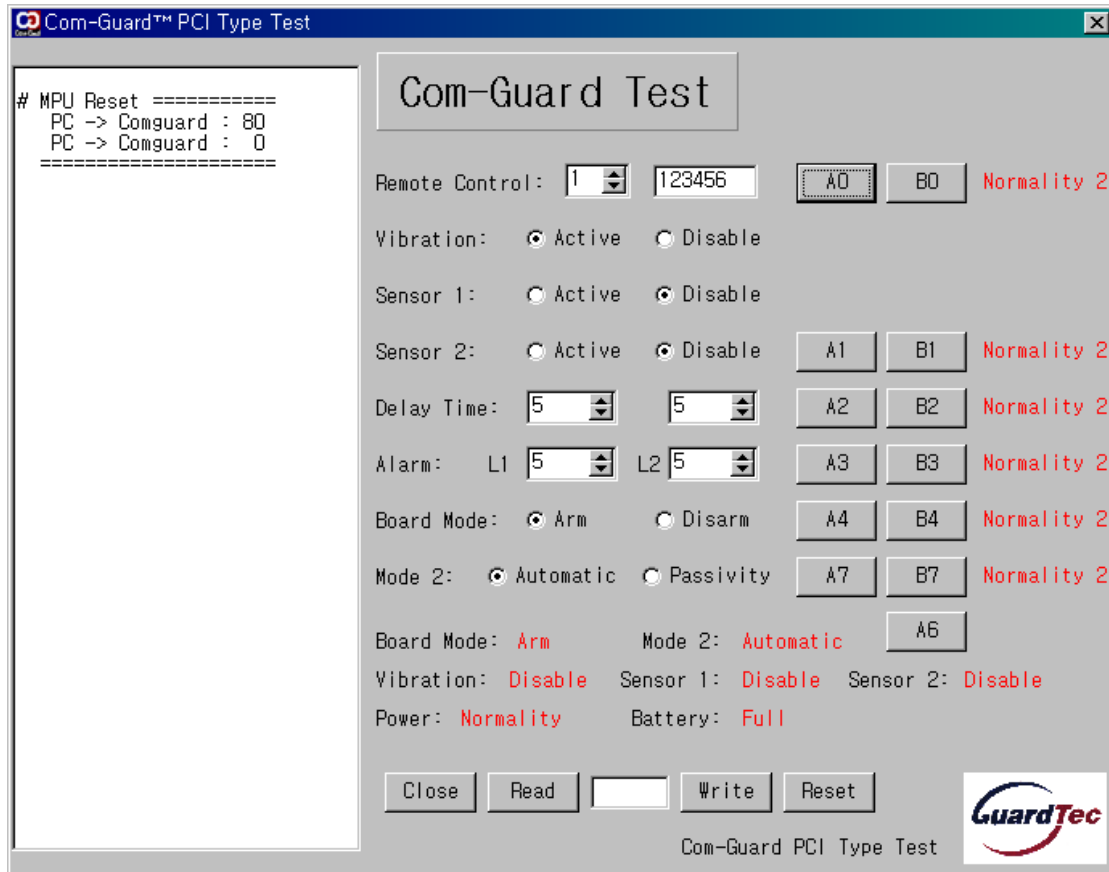
MPU Reset ========
PC -> Comguard : 80   → Initialize the input and output status
PC -> Comguard :   0   → Setting stand-by mode
====================

    Computer imports a value to Comguard with 'Read' command. Computer exports a value to Comguard through inputting it left 'Edit' button with 'Write' command. You can quit the test program with 'Close' command.