| DOCUMENT TITLE: | | |
|---|---|---|
| **Single/Multi Channel SECS RFID Reader Manual** | | |
| FORTREND ENGINEERING | **DOCUMENT NUMBER:** | **REV:** |
| | **230-024802-001** | **F** |
| | **SYSTEM(S) or MODULE(S):** | |
| | **RFID READER** | |


## Printed Copy of this Document is Uncontrolled
## User is Responsible for Verifying the Current Rev before use

| CHANGE HISTORY | | | | |
|---|---|---|---|---|
| **REV** | **DATE** | **DCO #** | **ORIGINATOR** | **CHANGE DESCRIPTION** |
| A | 2/6/2013 | | MK/LT | Initial Release |
| B | 3/17/2017 | | FH | Added FCC notice, antenna info and labelling guidance |
| C | 8/16/2017 | | FH | Update information for RFID reader (box) |
| D | 10/20/2017 | | FH | Updated labelling guidance |
| F | 10/7/2017 | | Molly | Update the labelling guidance<br>Add RET-200 specification and layout<br>Update the pictures. |

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

# Table of Contents



**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

# FCC NOTICE

## Federal Communications Commission Statement

NOTE - 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 communications. 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 of the following measures:
(a) Reorient or relocate the receiving antenna.(b) Increase the separation between the equipment and receiver. (c) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. (d) Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Labelling Guidance

The following information must be indicated on the host incorporating this device:

[For FCC]

| **Contains Certified Transmitter FCC ID: 2ALBARFIDMODULEV20** |
|---|

Or

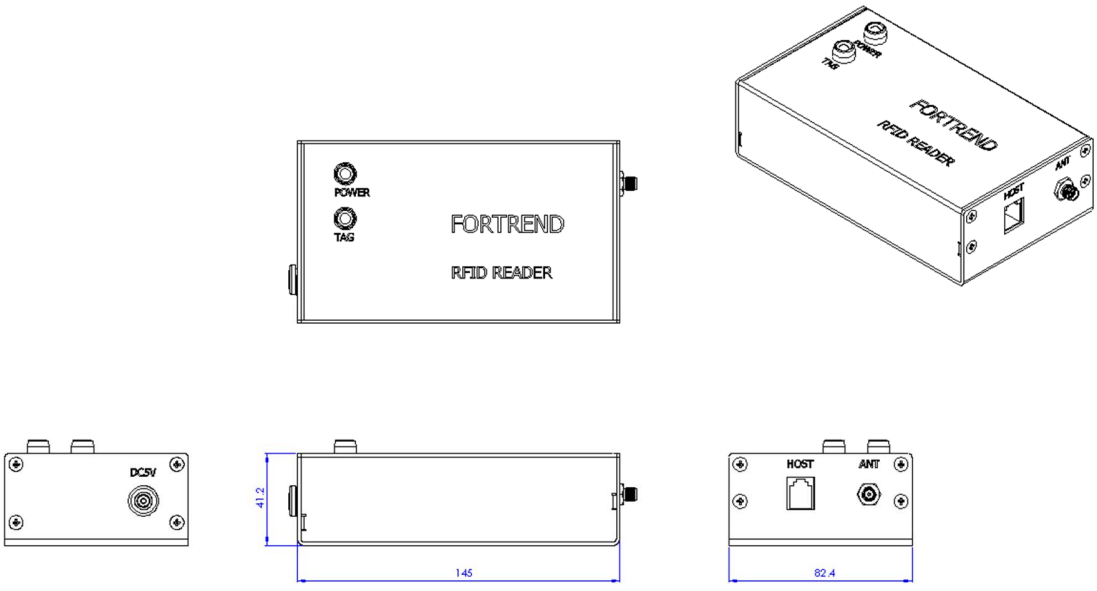
| **Contains FCC ID: 2ALBARFIDMODULEV20** |
|---|

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

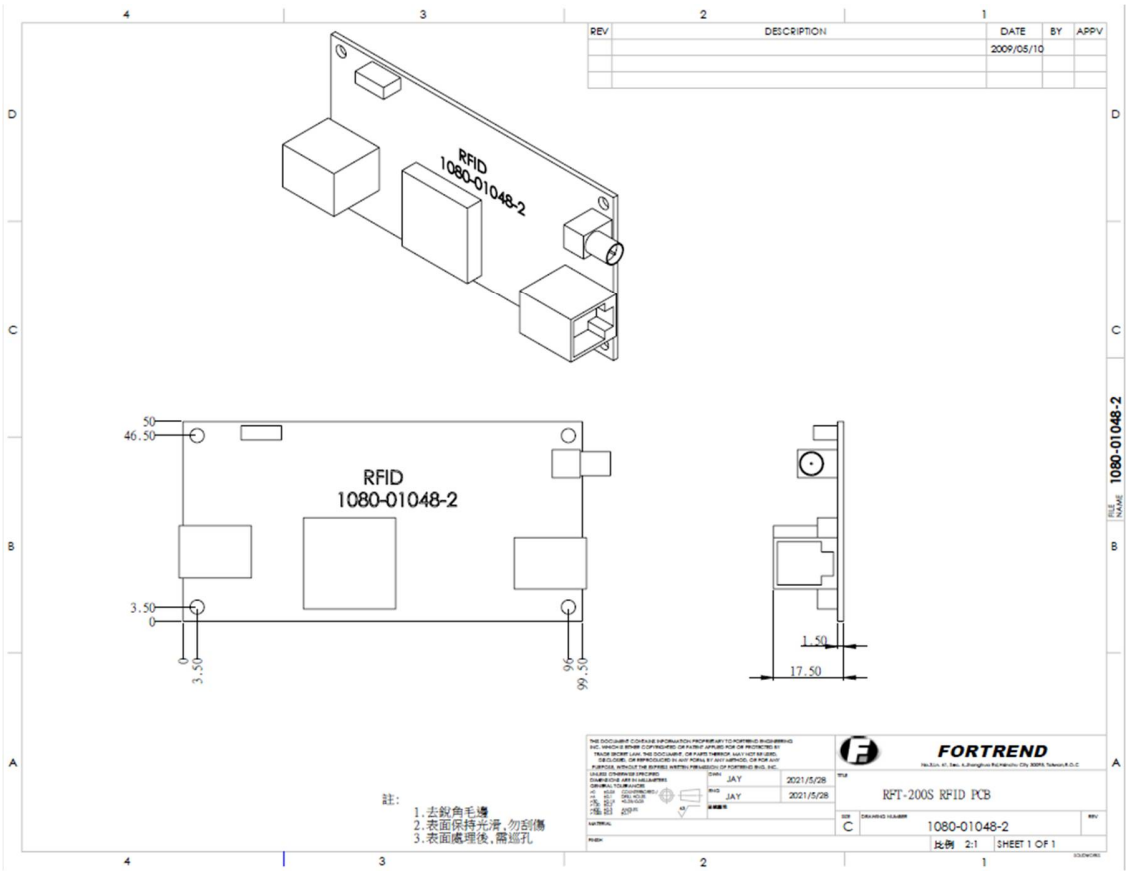
# RFT-200

## 1.1 Specification

| | |
|---|---|
| **Operating Frequency** | 134.2KHz |
| **Protocol Standard** | ✓ FORTREND HEX PROTOCOL<br>✓ SECS PROTOCOL |
| **Dimension** | 145x82.4x41.2 mm<br>(Main Board:99.5x 50mm) |
| **Supply Voltage** | Regulated 5V DC |
| **Supply Current** | Max. 100mA |
| **Operating Temperature** | -10°C to +60°C |
| **Weight** | 10 g |
| **Antenna** | Ø11mm, L:4.7cm(Assemble),cable RG174u 100cm.(440uH) |
| **Operating Distance** | Read:90mm<br>Write:50mm |
| **Host Interface** | RS232 (RJ12 CONNECTOR P1) |
| **Transponders** | RI-TRP-DR2B-40 |
| **Certificate** | CE FC |

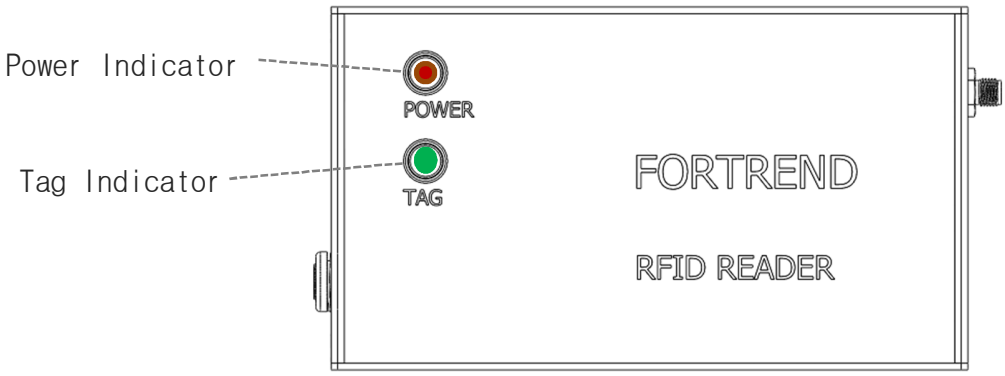



**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

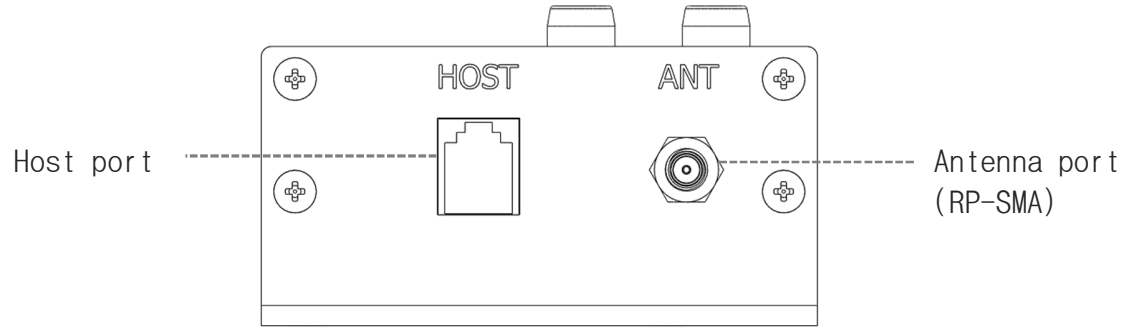



**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

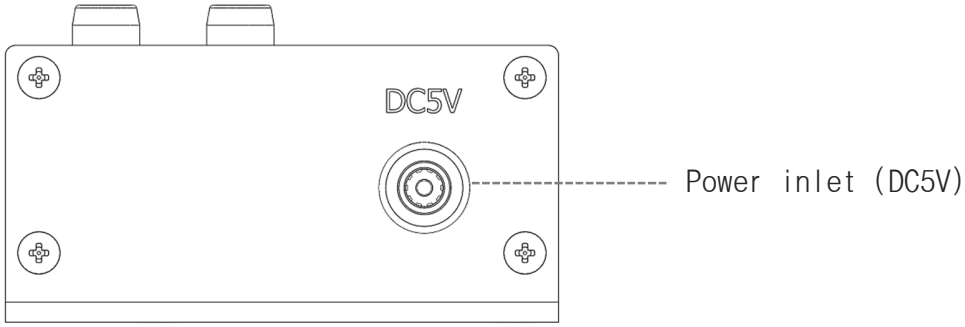
## 1.2 Layout




**Top View**

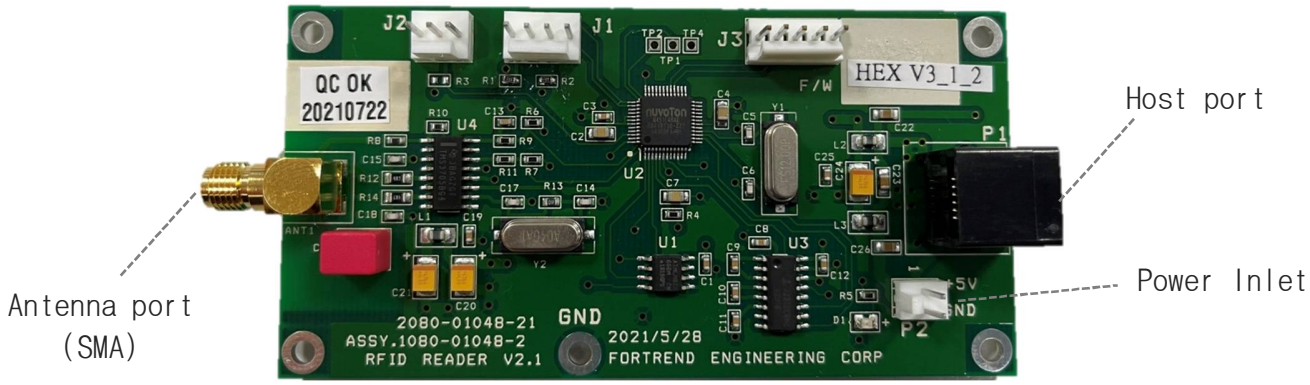



**Right View**

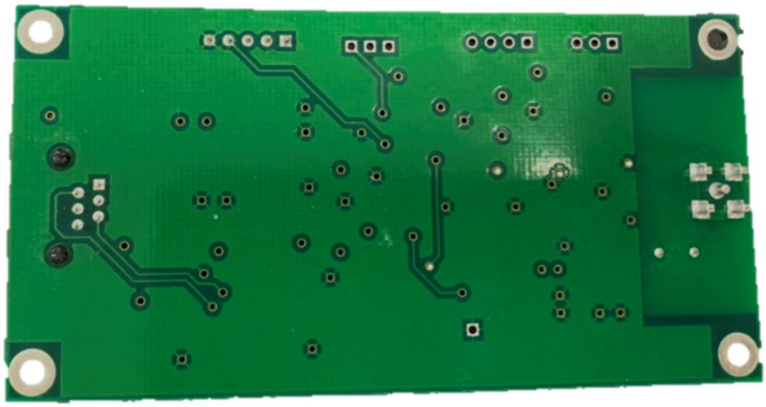



**Left View**

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**




**Front**

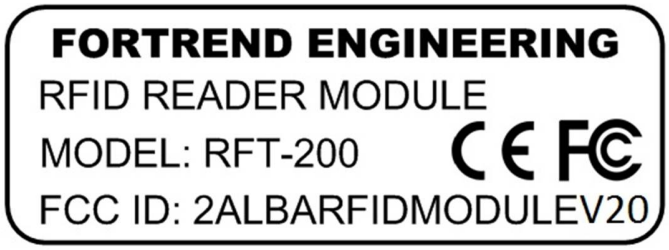


**Rear**

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

## 1.3 Label

The label is as shown in the figure below, including the model name and FCC ID.

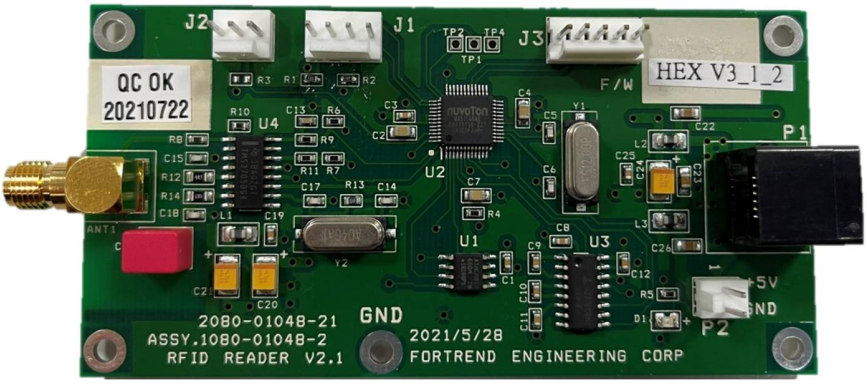



**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

# Firmware

## 1.4 Firmware

Firmware used is RFT-200S-3_SECS_V1.6, which was designed for 3 channel system, but it is used here for conformance with other products with single channel.




**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

# Antenna

## 1.5 Antenna Specification

The antenna connects to radio frequency module (RFM) and reader/writer to form the interface to the low frequency (LF) 134.2kHz TI transponder. The RFID modules transmit energy and signal to the transponder and receive the response from the tag. The stick antenna has custom cable length to meet the requirement of application.

| PARAMETER | PART NUMBER |
|---|---|
| | 1A01-E0103-1 |
| Type (Gain) | Ferrite rod, Linear polarized (7.5dBi) |
| Inductance | Typically 27μH @ 134.2kHz |
| Case material | Heat shrink tubing |
| Dimension | Φ6mm x 38mm long |
| Weight | 86g |
| Cable Length | 1m (or custom length) |
| Connection type | Coaxial connector RP-SMA straight plug |
| Option | Antenna Cover(1A05-A0403-1) |

**IMPORTANT**

Any change in antenna type or increase in antenna gain over that which was tested, will require additional testing and an FCC permissive change application before it can be used.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

# Use CtrlReader Program

## 1.6 Single Channel

### *1.6.1* Hardware Setup

On site and completed system

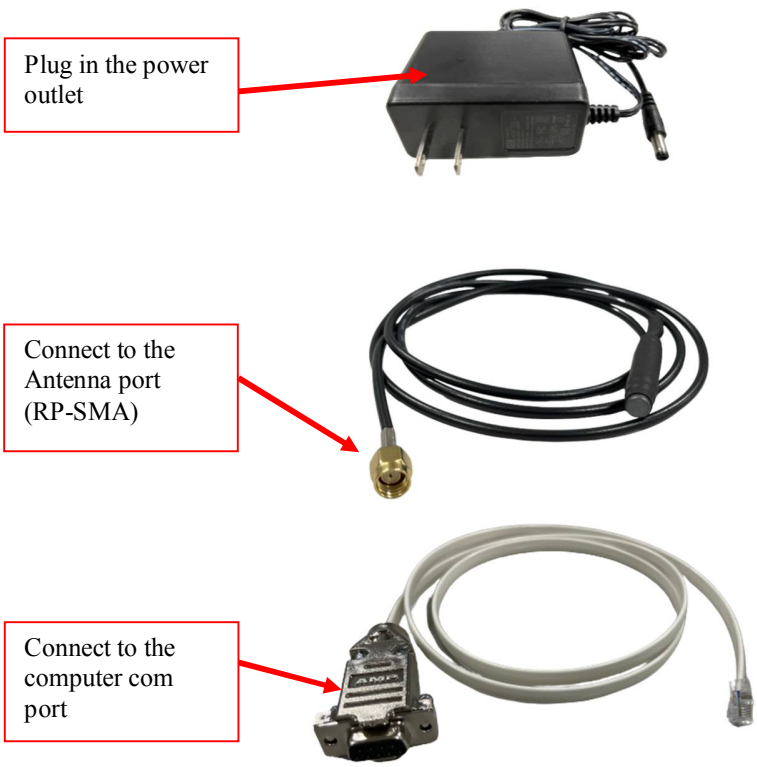
1. Connect DB9 cable to the serial port between the tool interface panel and computer.


Serial port at interface panel

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

## In Lab

1. Connect the testing DB9 cable and power supply as picture shown below.




**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

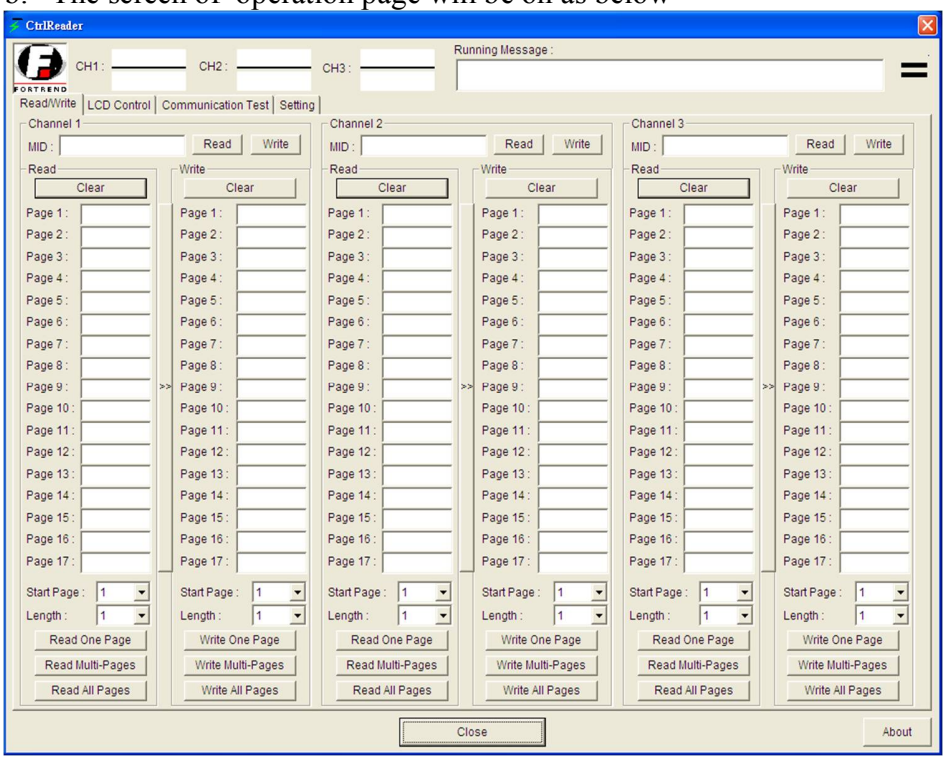
2. Hook up communication cable and antenna on the RFID reader.


3. Connect the DB 9 cable to the computer and plug the power supply to the power source.
4. Red light “Power” indicator on the top of the RFID Reader should be “ON” if all connection is correct and ready to run testing.
5. Green light “TAG” indicator should be “ON” during the tag reading or writing.


**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

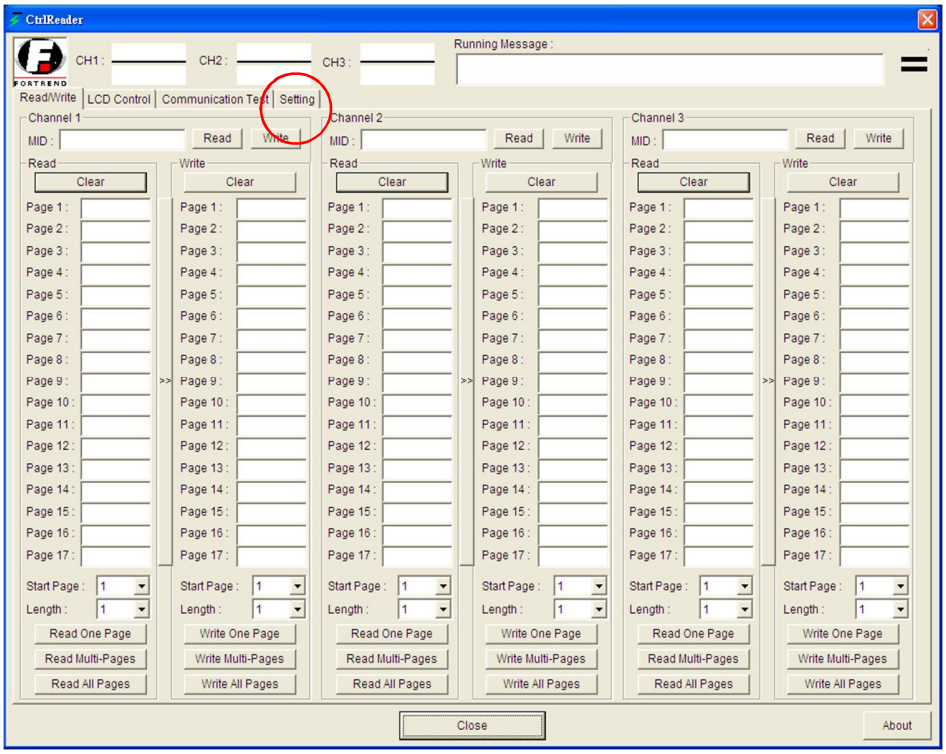
### 1.6.2 Start CtrlReader

a. Open operation software “CtrlReader.exe“.
b. The screen of operation page will be on as below

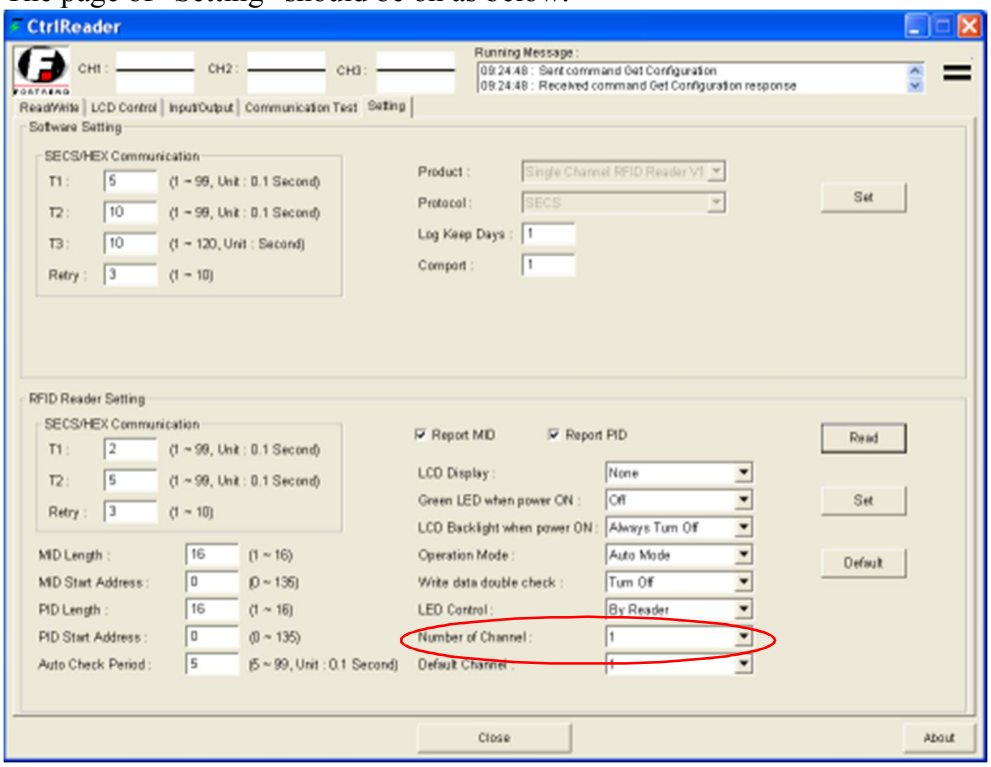



c. Click the “Setting” icon on the tool bar.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

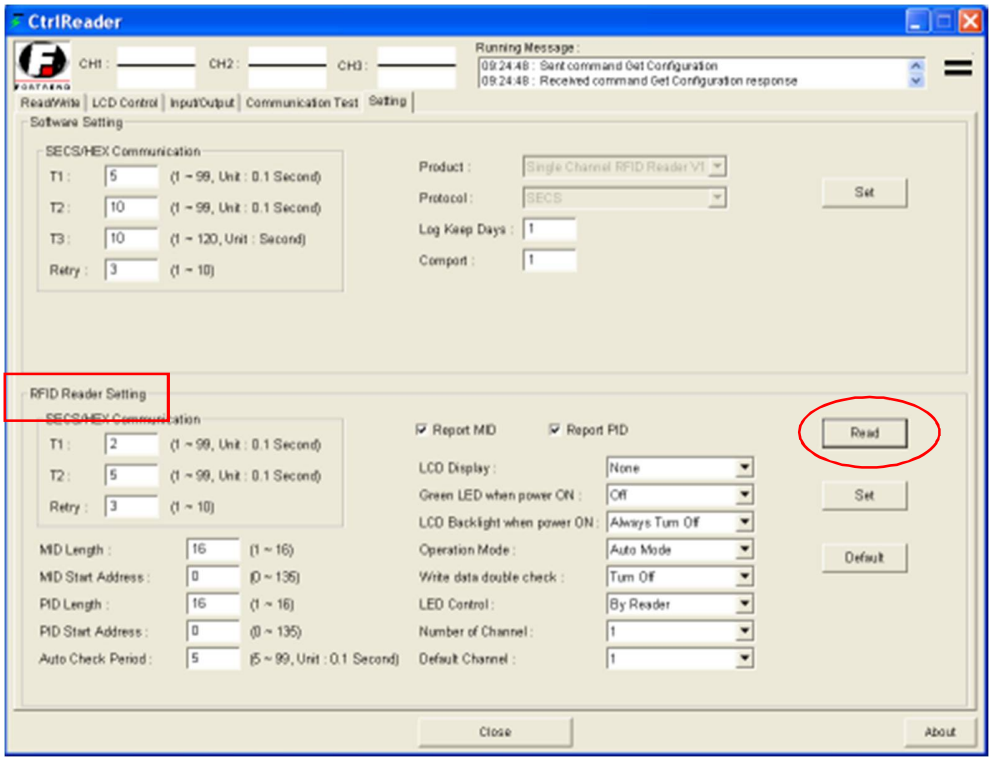



The page of "Setting "should be on as below.

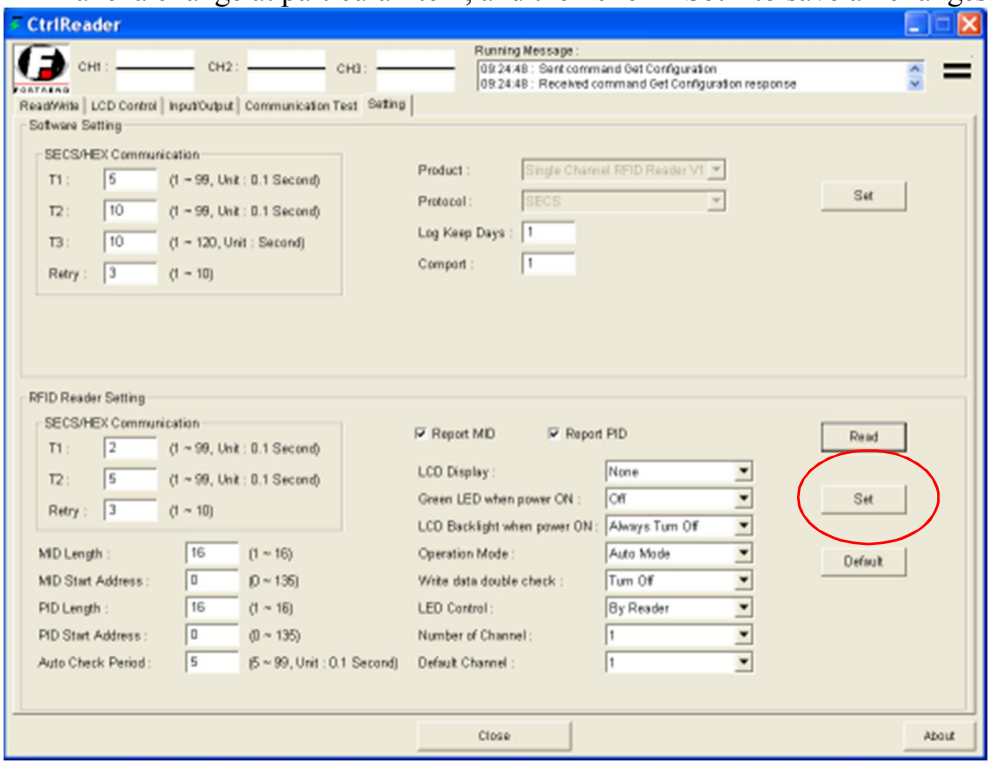



d. Click "Read" icon in order to check the default setting of RFID board.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**



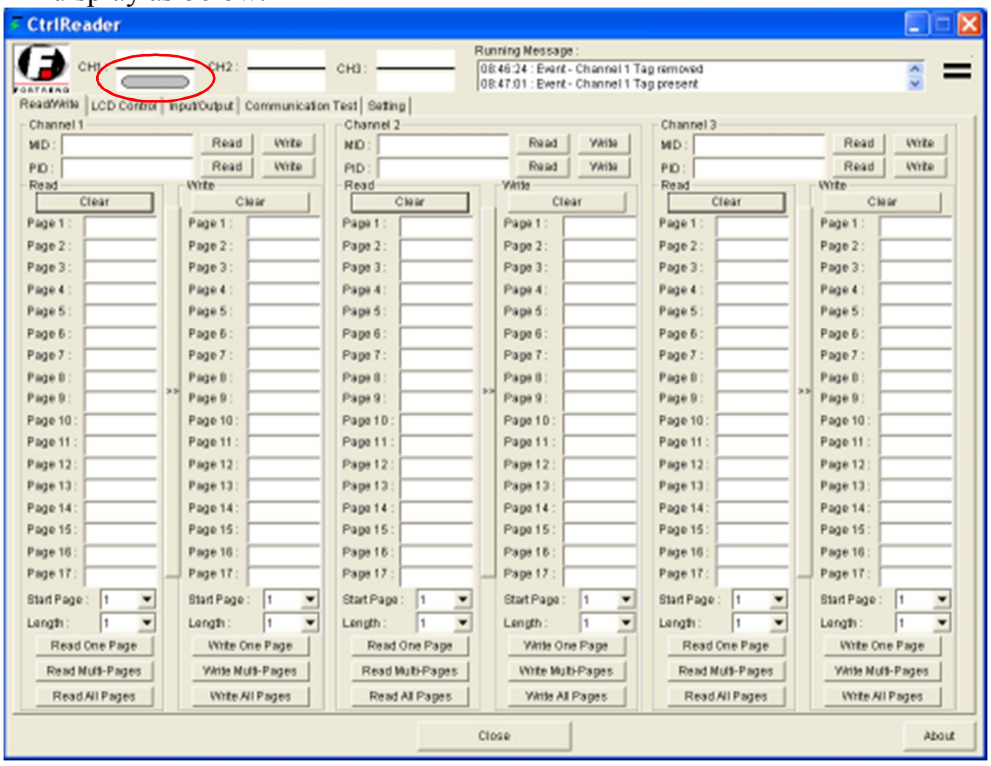

e. If the setting is not correct or not match to the customer's specification, make a change at particular item, and then click "Set " to save all changes.




**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

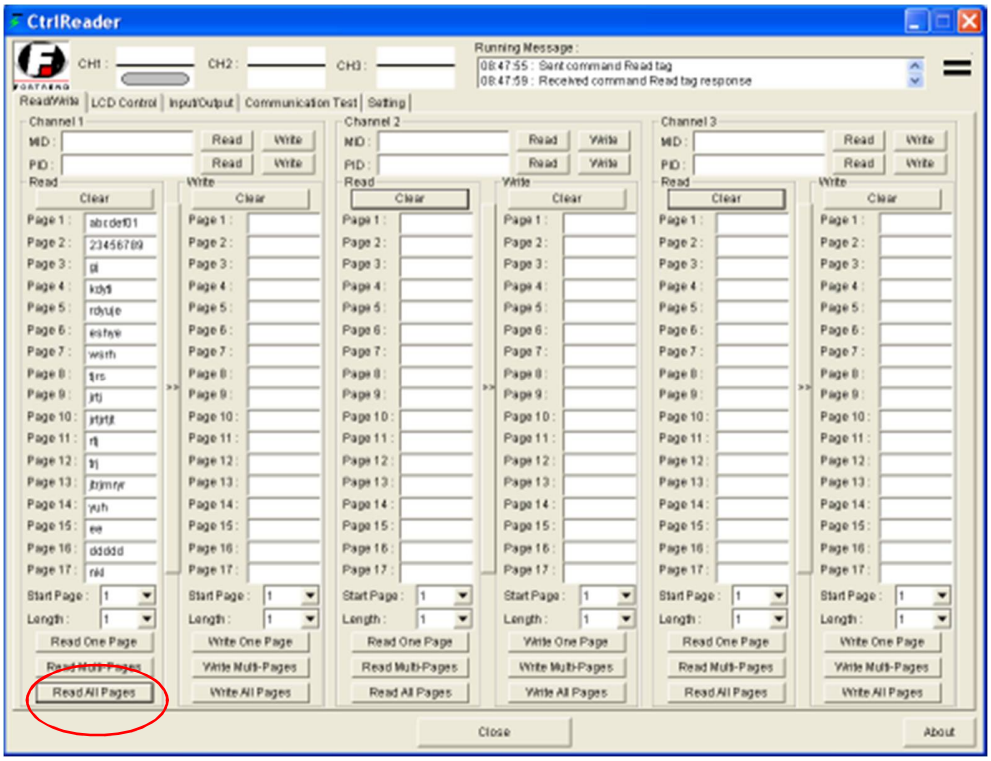
### 1.6.3 Read/Write Demo

1. Click the icon “Read/Write” in order to test the RFID reader.
2. Place tag next to the antenna, the status of channel would indicate and display as below.

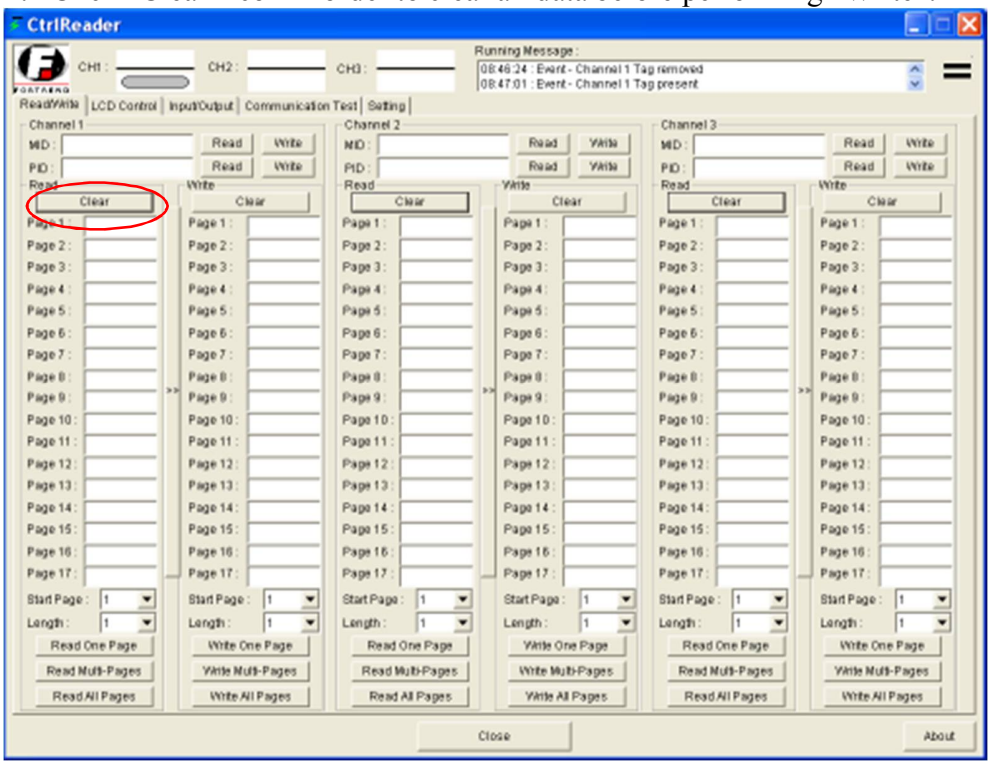



3. Click “Read All Pages” icon on Channel “1”, the channel should display data on box of each page.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

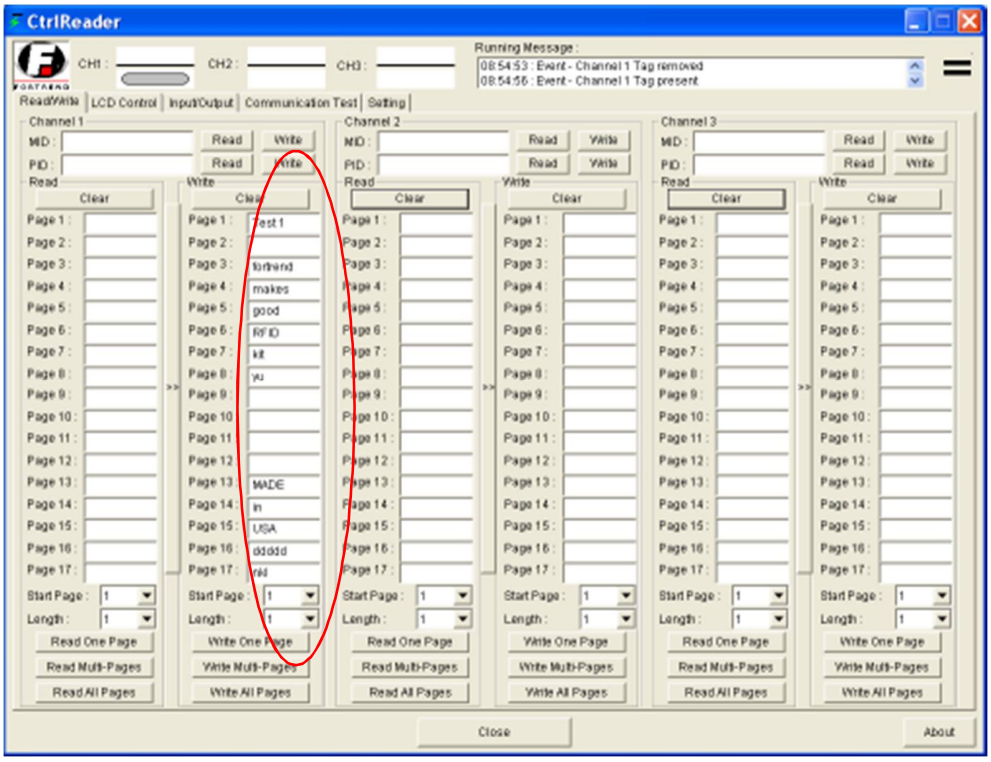



4. Click “Clear” icon in order to clear all data before performing “Write”.

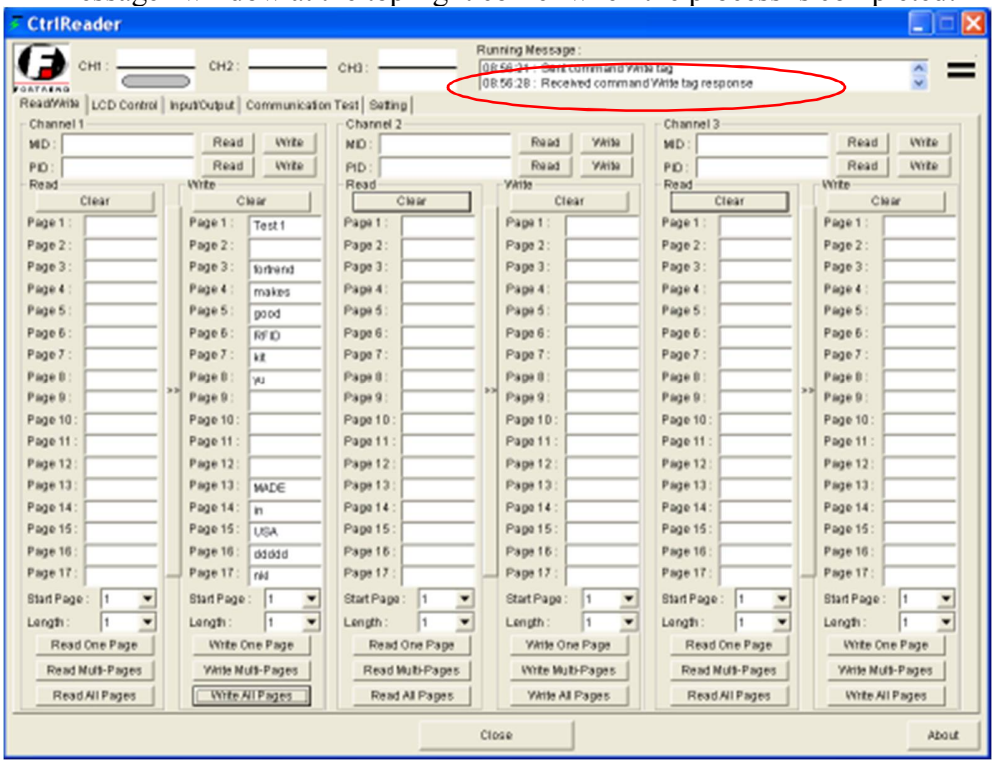



5. Type new data on the box of ‘Write” from page 1 to page 17 at channel “1”

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

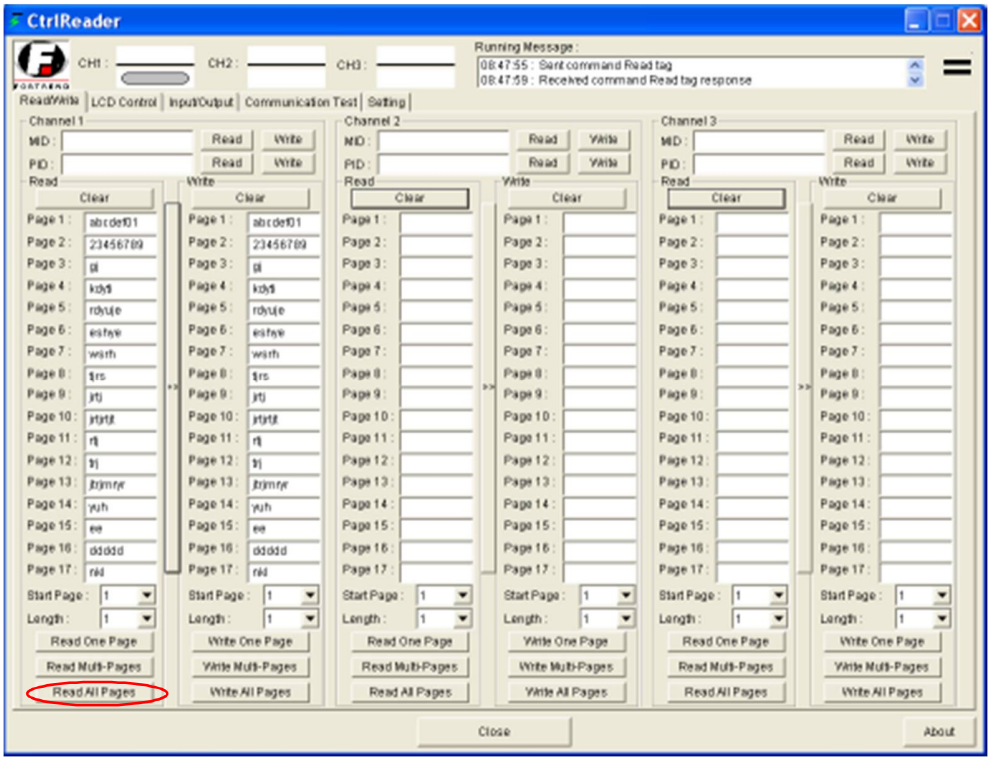



6. Click “Write All Pages”, and wait for “Running Message” response- “Received command Write Tag response” that should be shown at “Running Message” window at the top right corner when the process is completed.



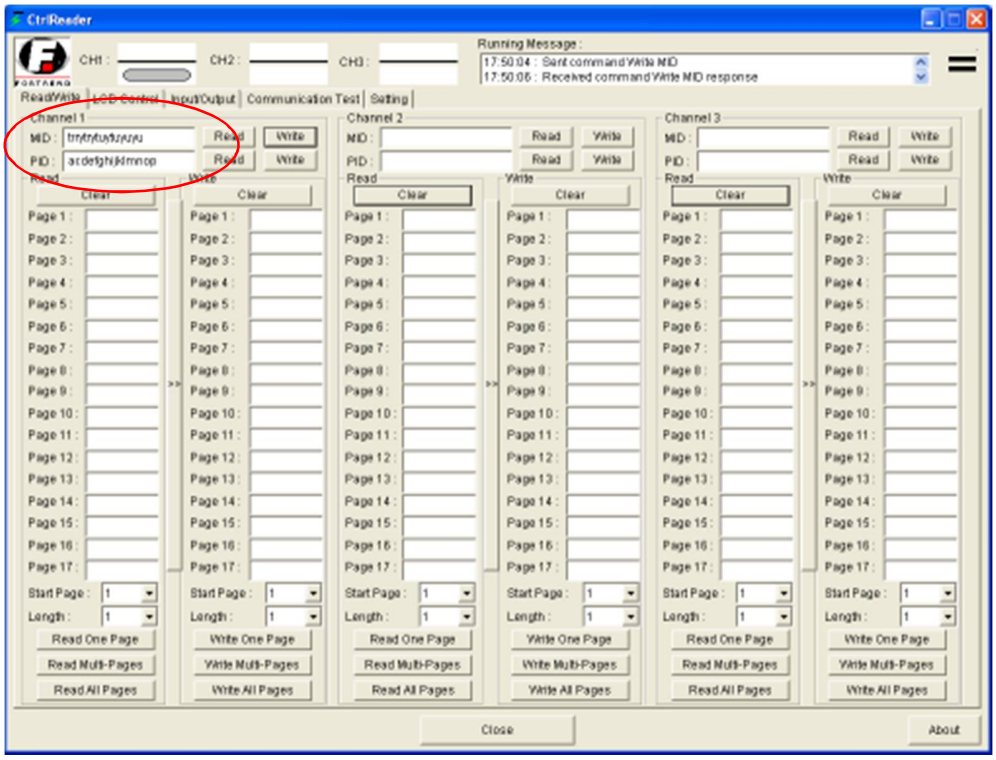

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

7. Click “Read All Page” in order to verify the new data, those should be match to all data of “write”.

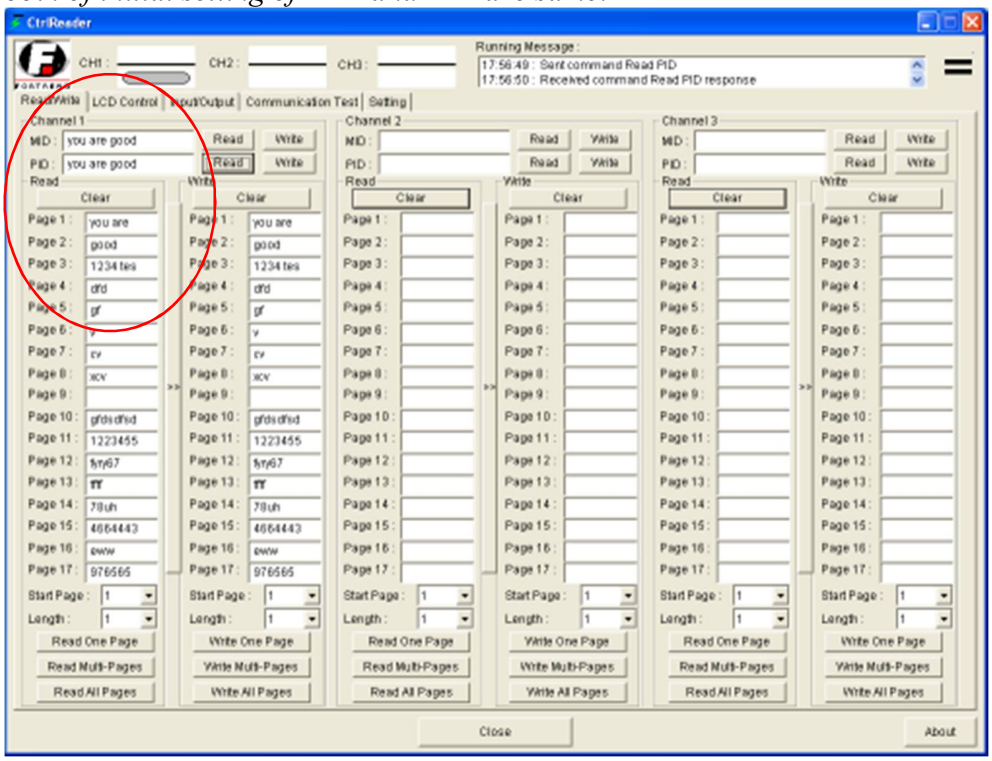



8. OR, individually click ‘Read” icon on channel “MID” or “PID”, box of MID or PID should show data if “Report the MID” and “Report the PID” is activated on the initial setting. “MID” and “PID” only read/write max 16 character from address 0 to 135 depends on the initial setting.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

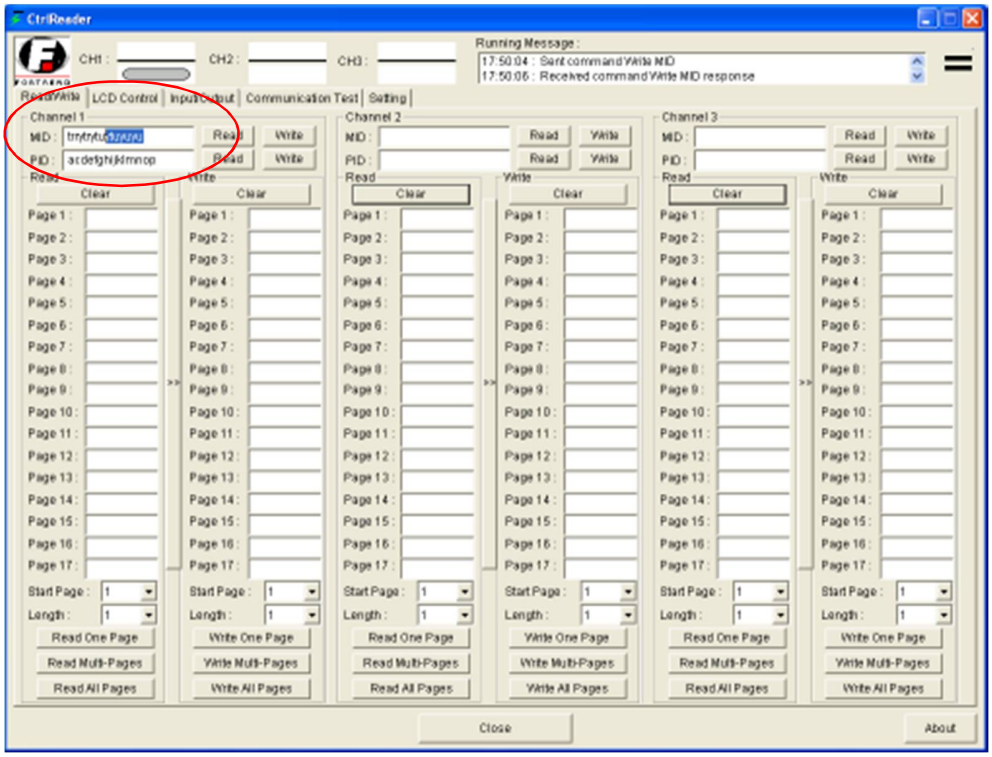



*Note: Compare style of reading data between "MID & PID" and all pages. If both of initial setting of MID and PID are same.*



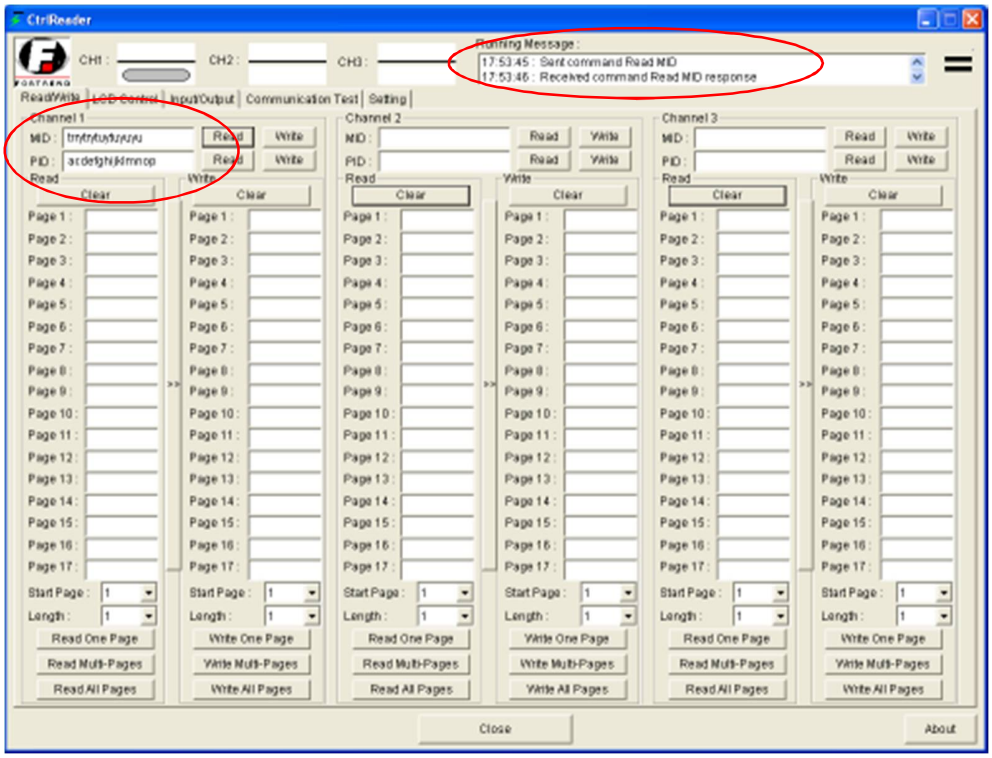

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

9. there are no “clear” button to perform clear old data at the box of “MID” and “PID”; using “delete” button on keyboard to clear old data during test “Read” or “Write”.




10. Type new data on the box of “Write”, and then click the “Write “icon. Wait for the response message from the “Running Message” window, as same as step “6”.
11. Click the “Read” icon, the “WRITTEN” data disappear a second (if not clear all data after processing “write”), and show the data again. Those data should be match.)

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**



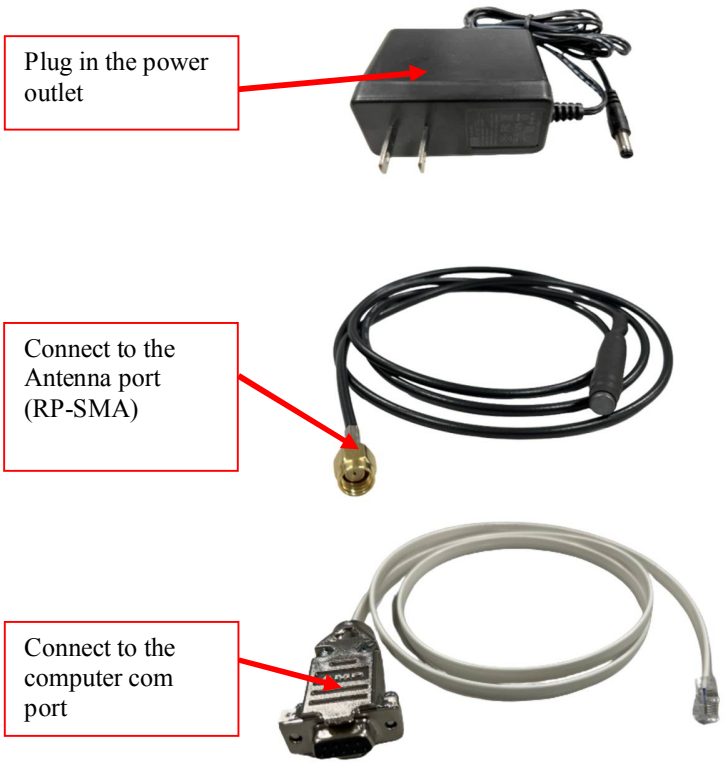

12. Continue to test few times to make sure that is no error.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

## 1.7 Multi Channel

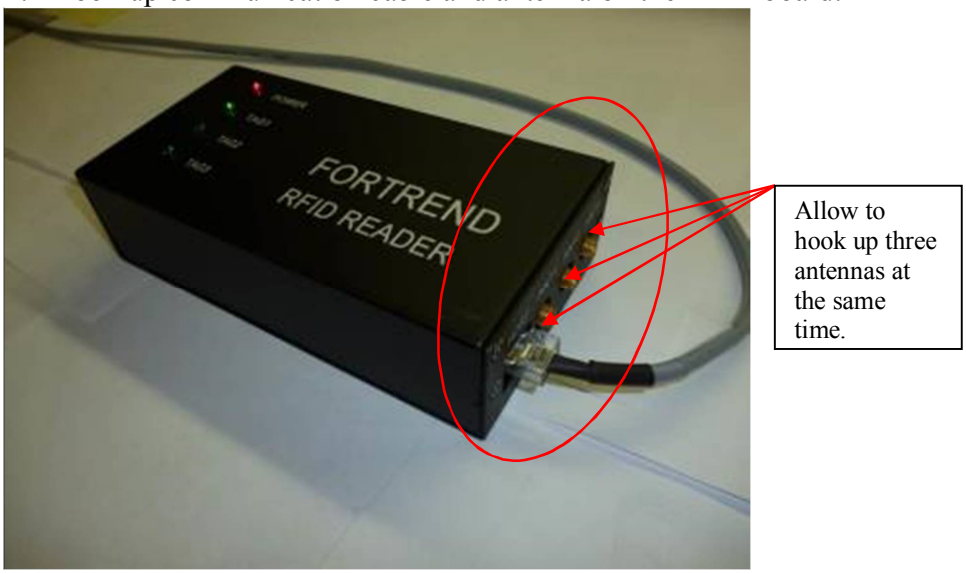
### 1.7.1 Hardware Setup

1. Connect the testing DB9 cable and power supply to the RFID as picture shown below.




**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

2. Hook up communication cable and antenna on the RFID board.





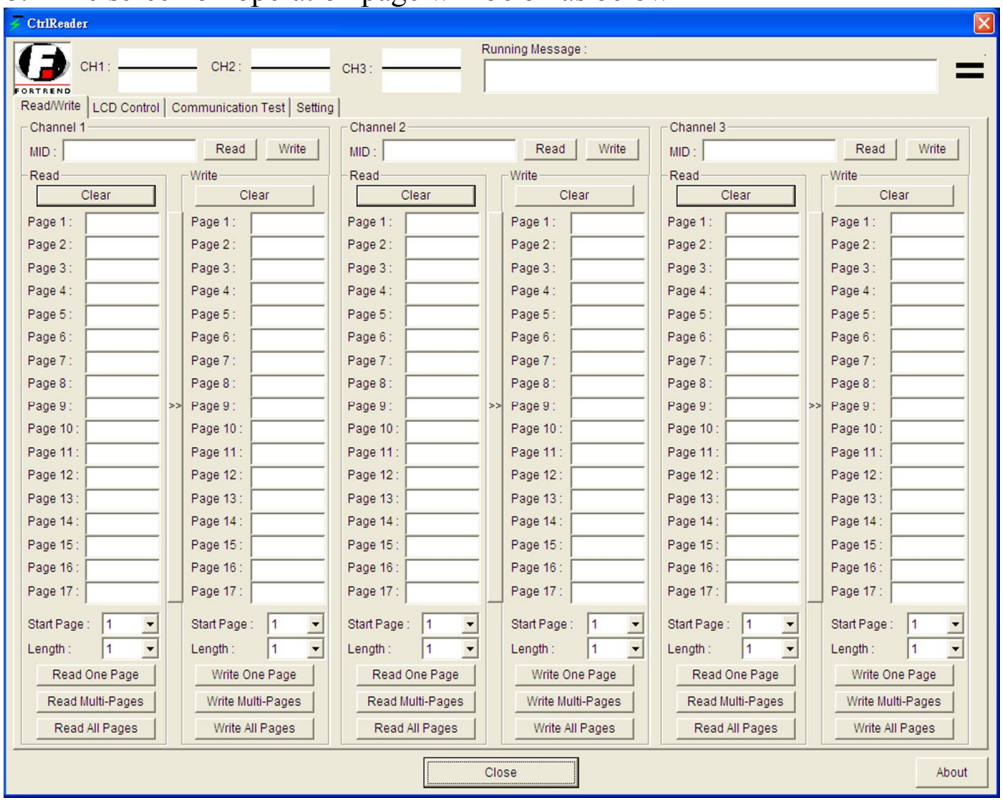
3. Connect the DB 9 cable to the computer and plug the power supply to the power source.
4. Red light “Power” on the top of reader should be “ON”, and three green lights are cycle “ON” through TAG 1 to TAG 3.if the connection is correct and ready to run testing.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**


**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

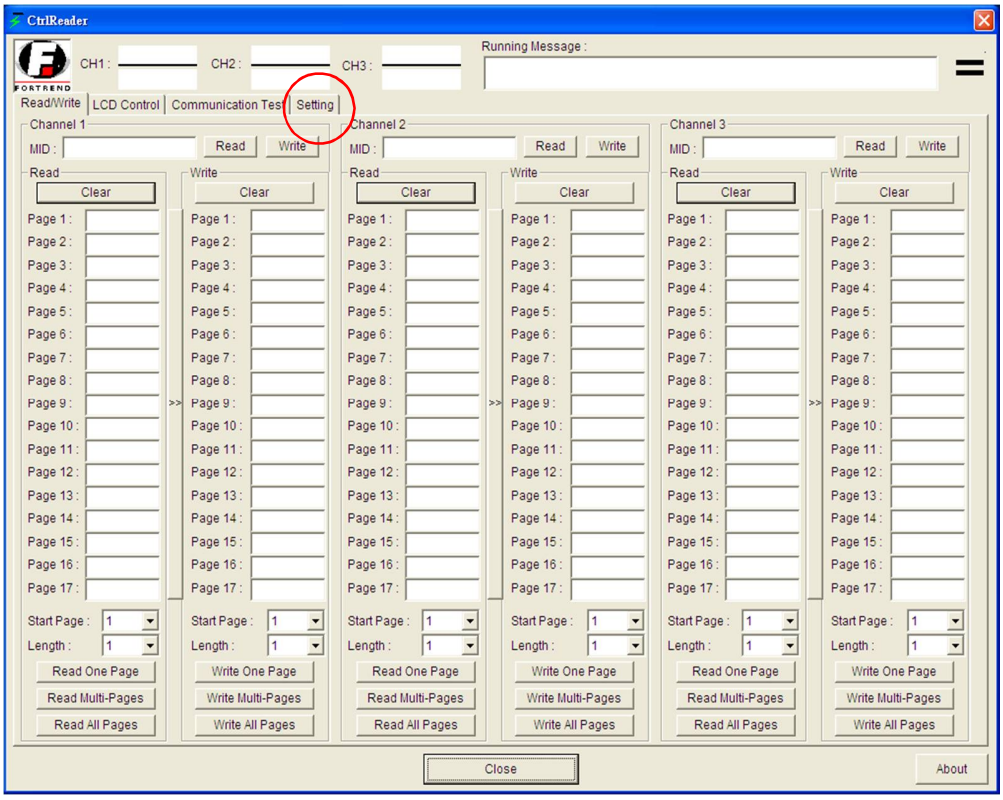
### 1.7.2 Start CtrrlReader

a. Open operation software “CtrlReader.exe“.
b. The screen of operation page will be on as below



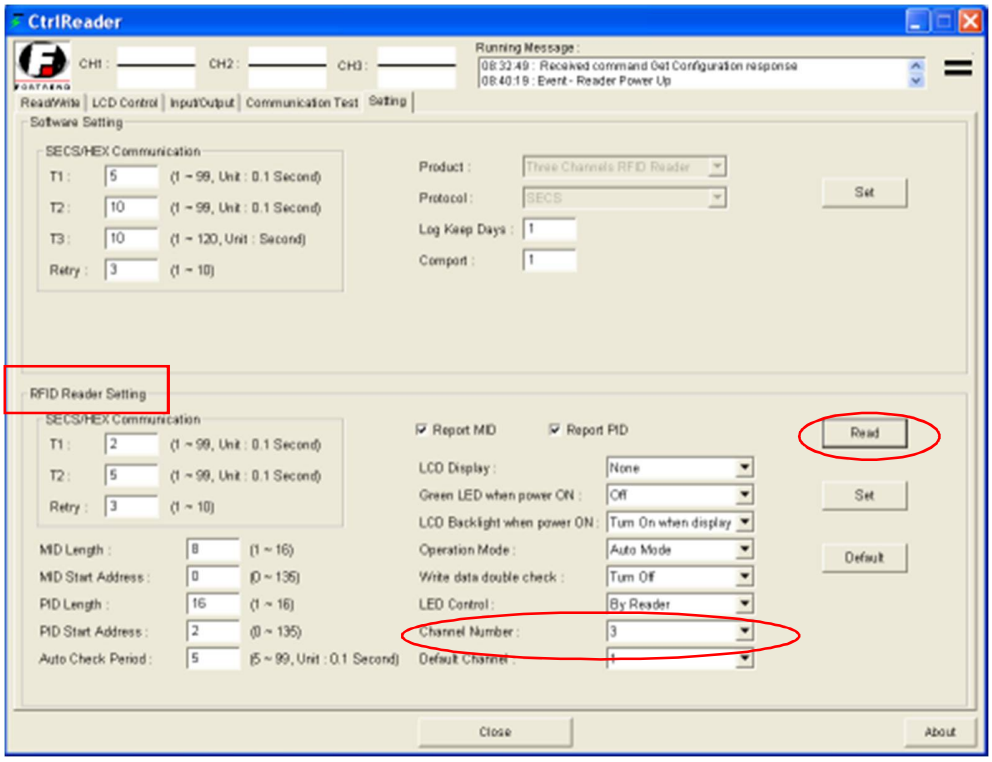

c. Click the “Setting” icon on the tool bar.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

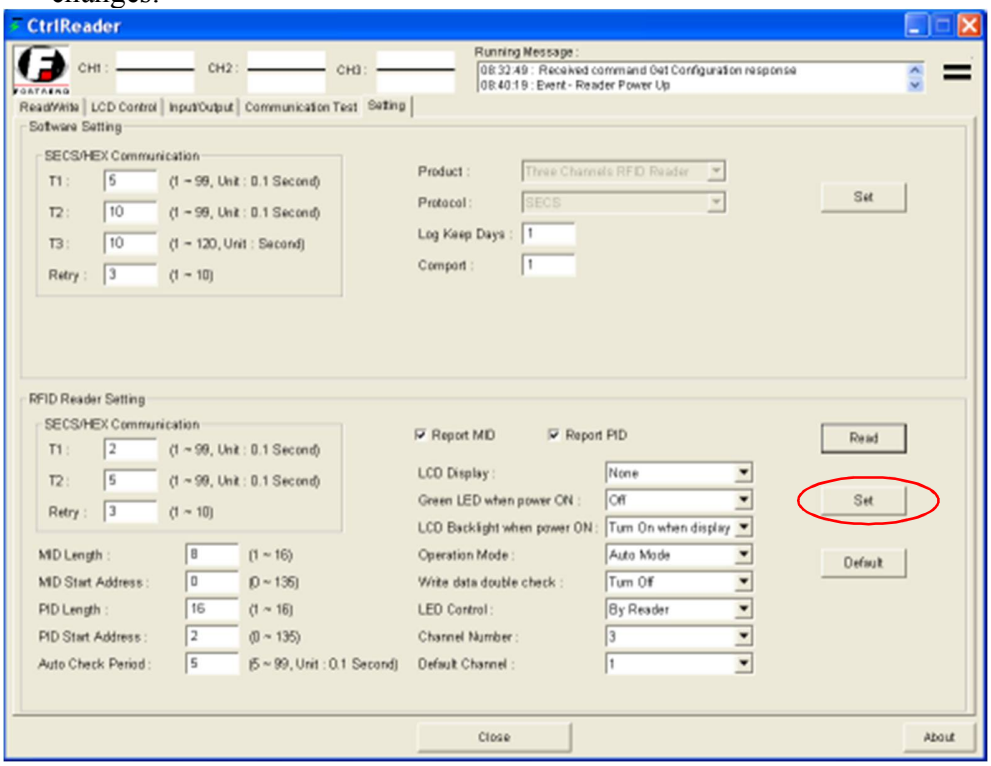



d. Click “Read” icon in order to check the default setting of RFID board. The page of “Setting “should be on as below.
*Note: Number of Channel should be “3" (maximum channels setting).*

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**



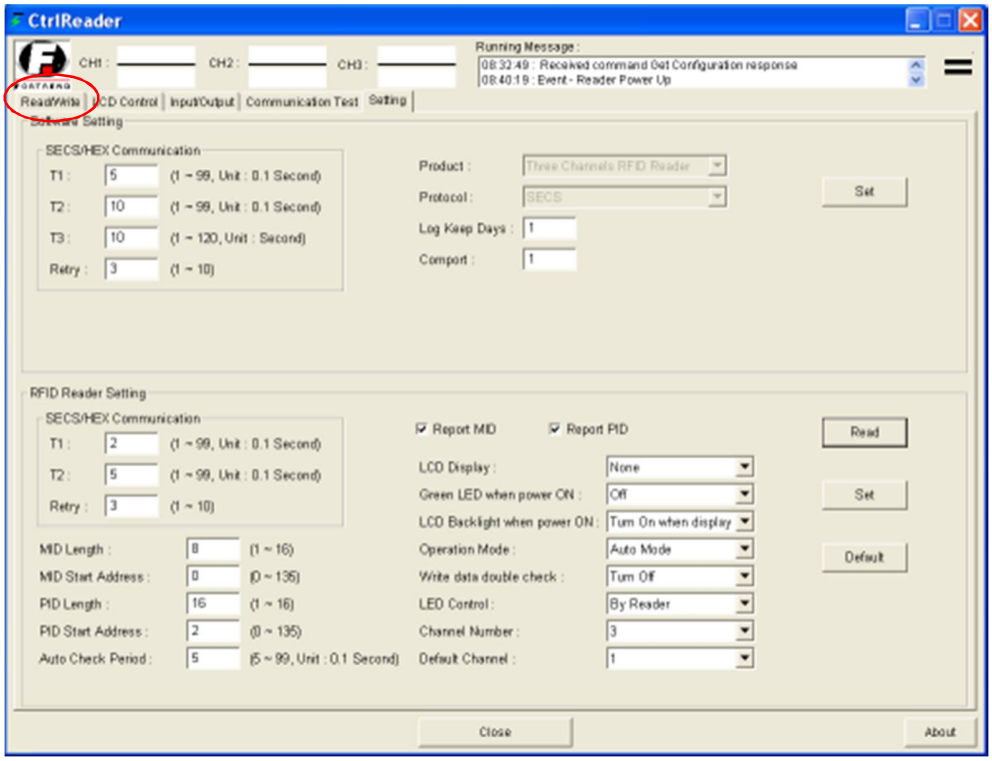

e. If the setting is not correct or not match to the customer's specification, make a change at particular item box, and then click "Set " to save all changes.




**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**

### 1.7.3 Read/Write Demo

1. Click the icon “Read/Write” (Return to the operation screen) on the tool bar in order to test the RFID reader.




2. Place tag next to the antenna, the status of channel would indicate and display as below.

**Proprietary Note: This document contains confidential information proprietary to Fortrend Engineering, any disclosure or unauthorized use is prohibited.**