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

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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)

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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 device of this module.
[For FCC]
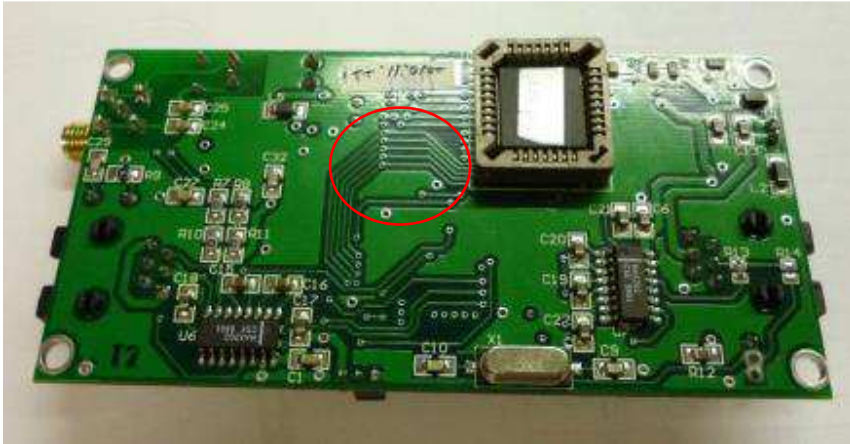
Contains Transmitter Module FCC ID: 2ALBARFIDMODULE

Or

Contains FCC ID: 2ALBARFIDMODULE

Firmware

1.1 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.

The chip is replaceable and the connector place on the back side of the RFID board.

Antenna

1.2 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
	013-0017
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, 2m, 3m or custom length
Connection type	Coaxial connector SMA straight plug

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.

Use CtrlReader Program

1.2 Single Channel

1.2.1 Hardware Setup

<u>On site and completed system</u>

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

Serial port at interface panel

<u>In Lab</u>
1. Connect the testing DB9 cable and power supply as picture shown below.
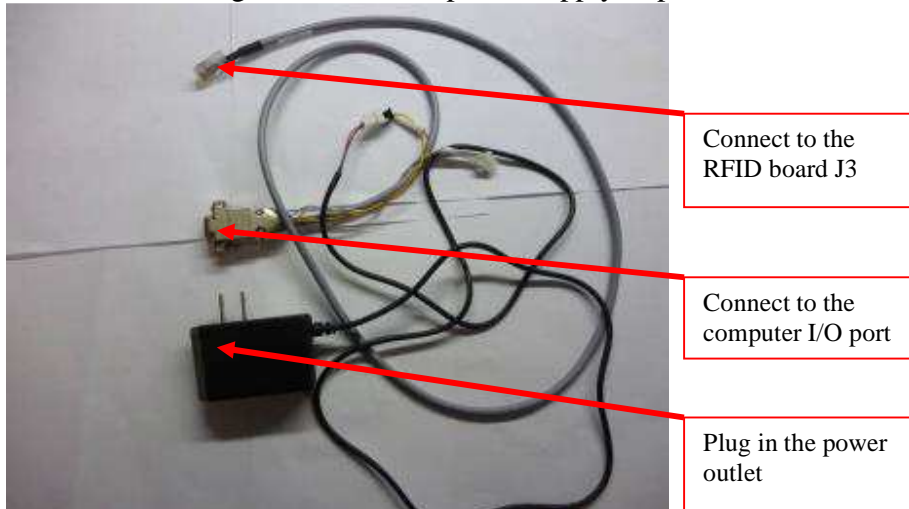
Connect to the RFID board J3

Connect to the computer I/O port

Plug in the power outlet

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. Green light "D1" on the corner of the single board should be "ON: if all connection is correct and ready to run testing.

1.2.2 Start CtrlReader

a. Open operation software "CtrlReader.exe".
b. The screen of operation page will be on as below
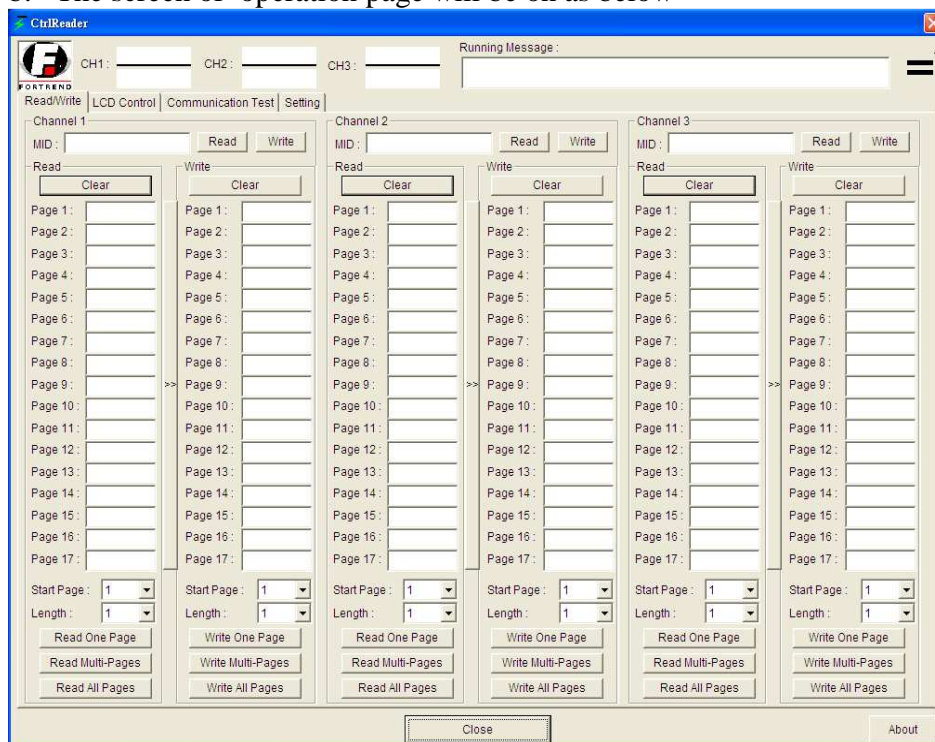
c. Click the "Setting" icon on the tool bar.
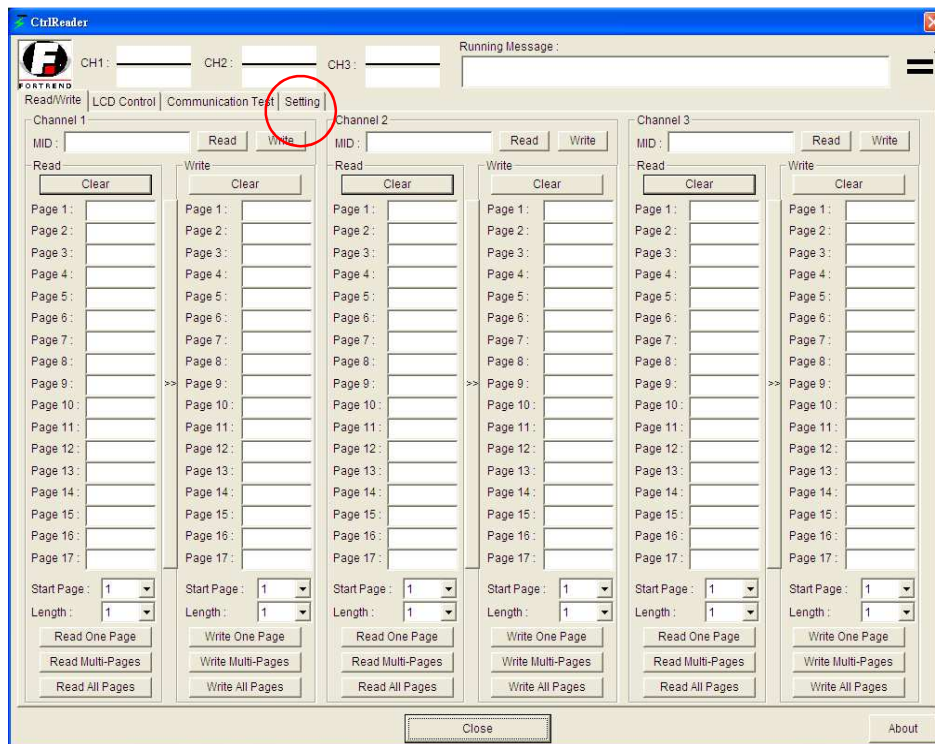
The page of "Setting "should be on as below.
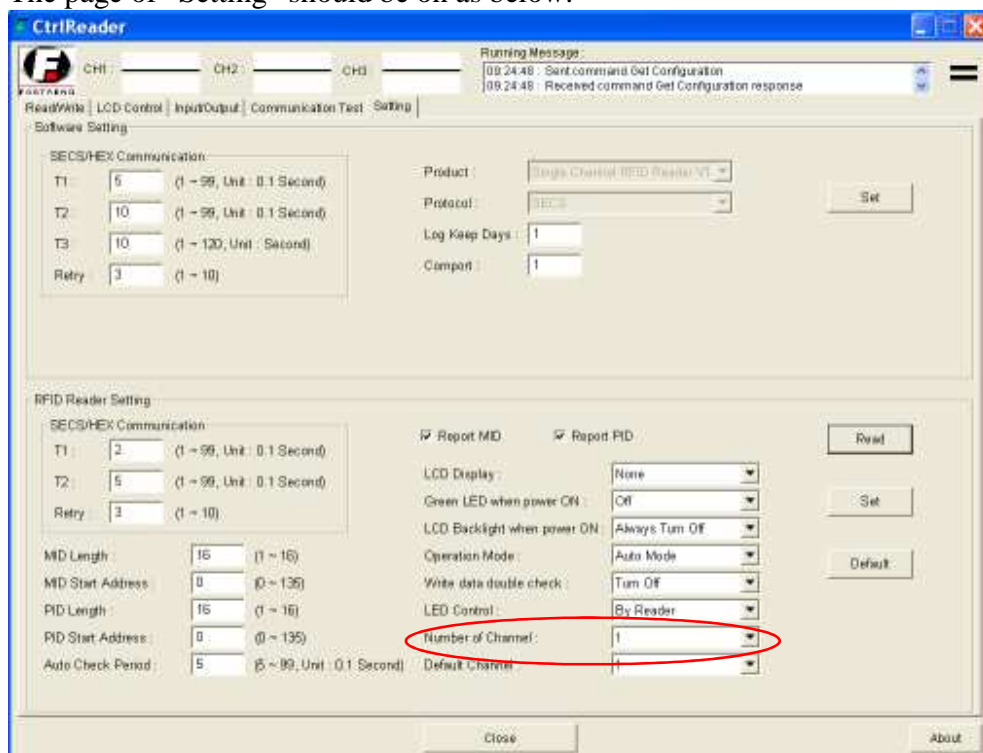
d. Click "Read" icon in order to check the default setting of RFID board.
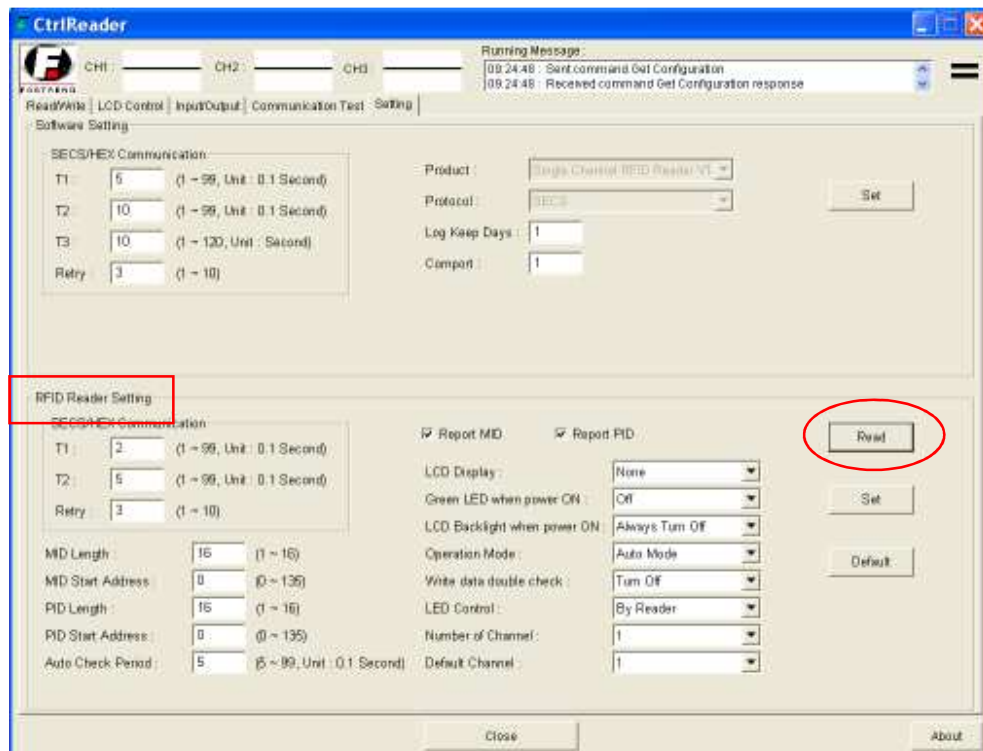
e. If the setting is not correct or not match to the customer's specification, make a change at particular item, and then click "Set " to save all changes.
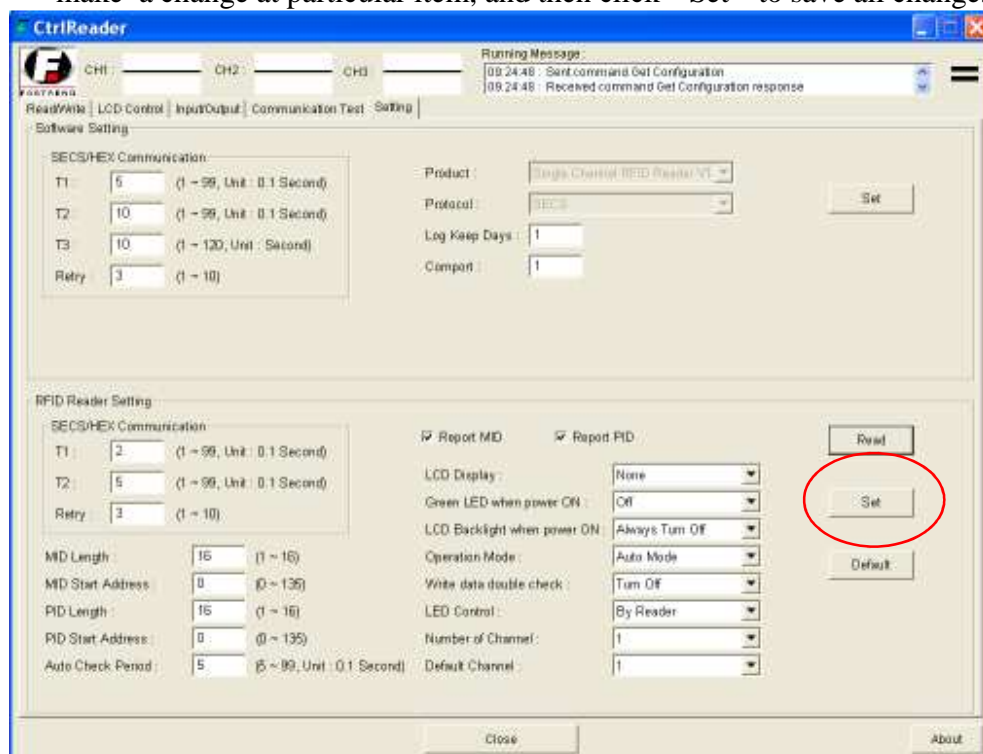
1.2.3 Read/Write Demo

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.
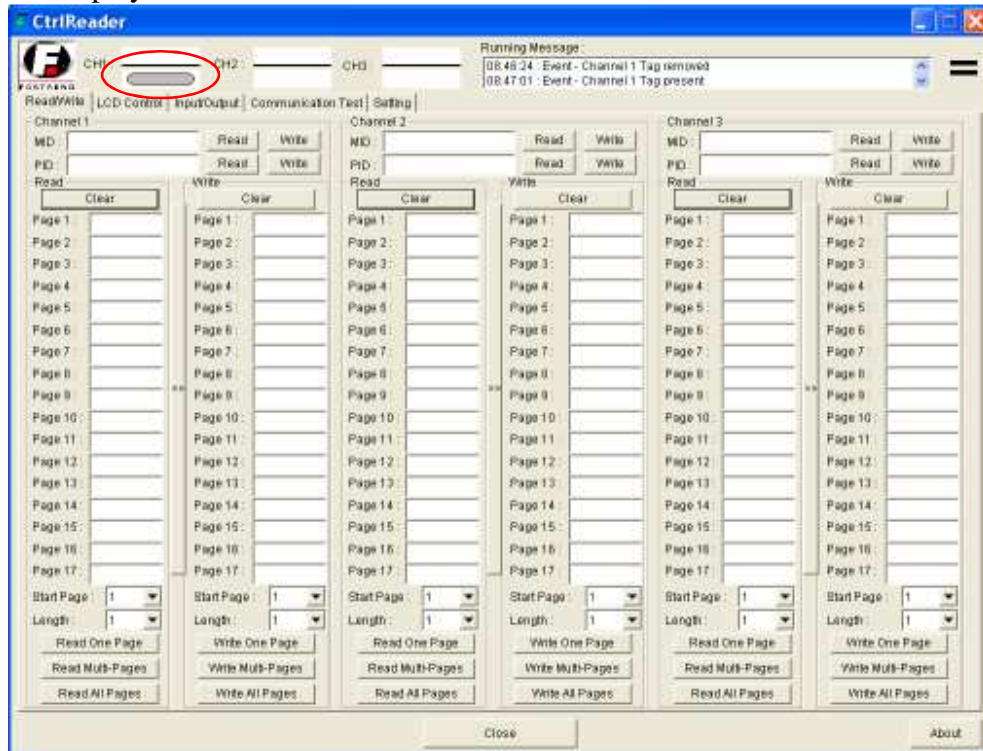
3. Click "Read All Pages" icon on Channel "1", the channel should display data on box of each page.
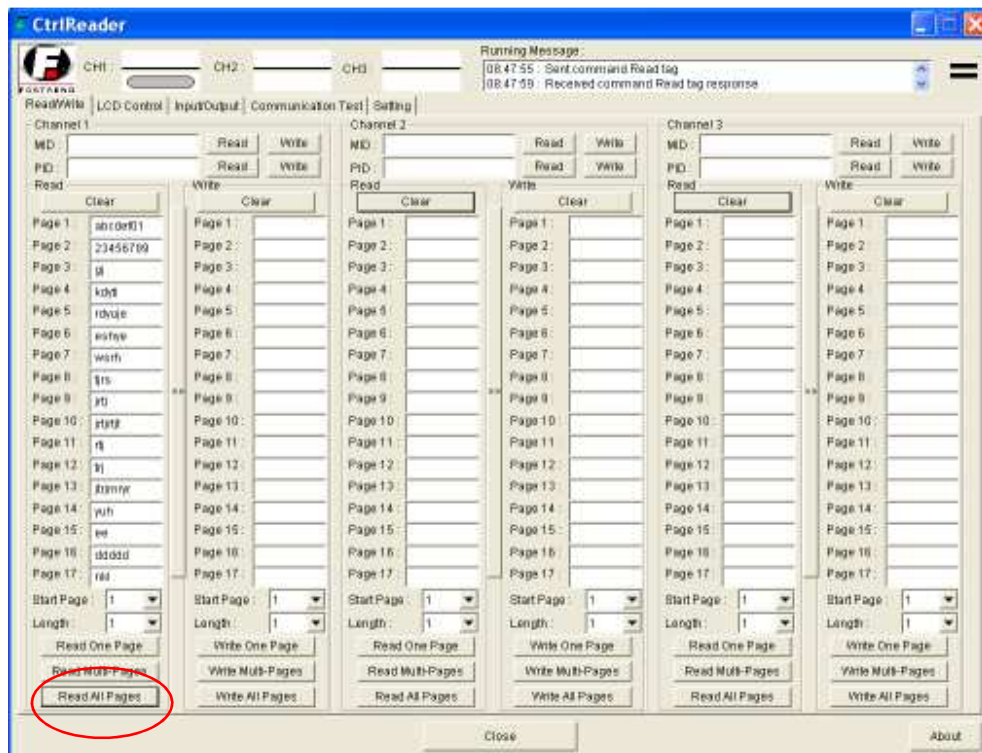
4. Click "Clear" icon in order to clear all data before performing "Write".
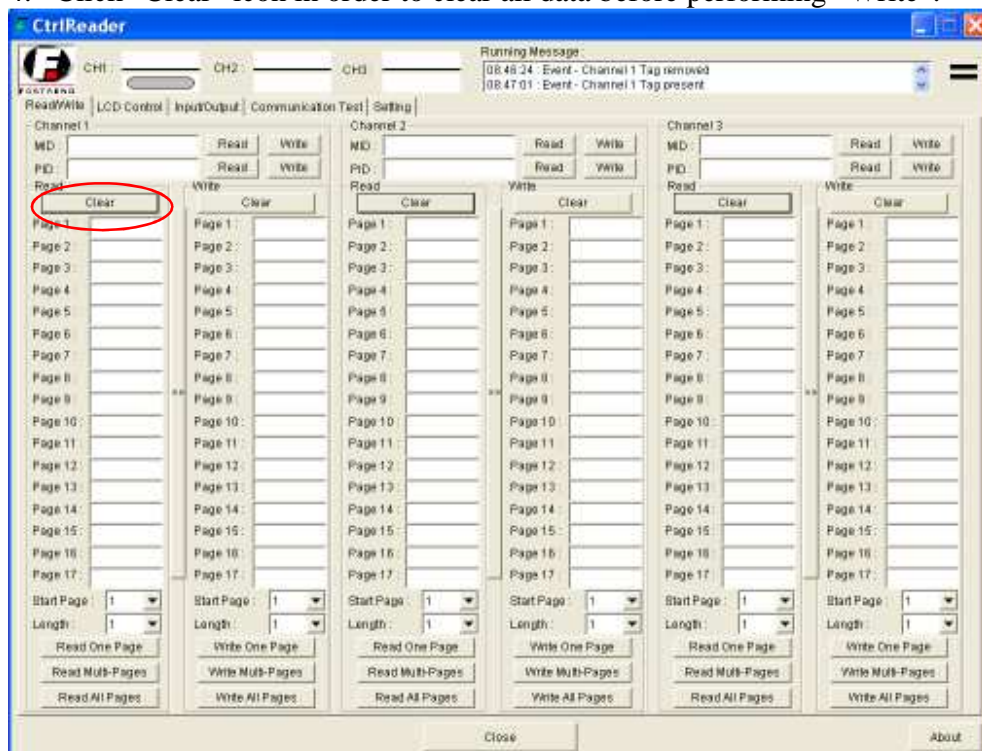
5. Type new data on the box of 'Write" from page 1 to page 17 at channel "1"

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.
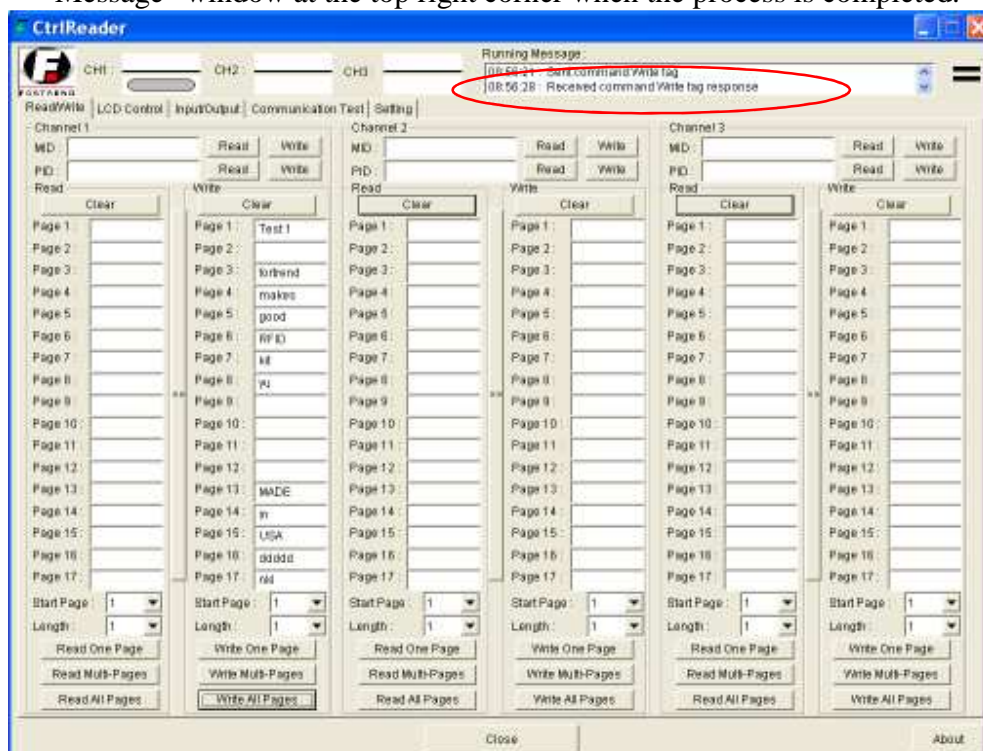
7. Click "Read All Page" in order to verify the new data, those should be match to all data of "write".
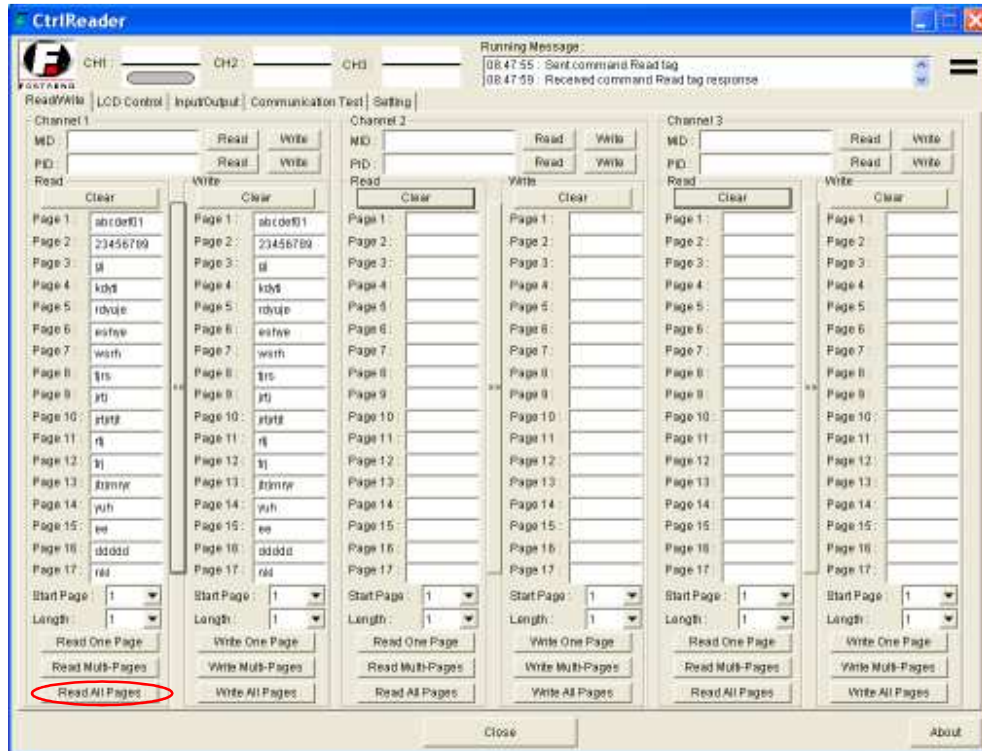
8. OR, individually click 'Read' icon on channel "MID" or "PID", box of MID or PID should show data if "Report the MID" and "Report the PID" is activated on the initial setting. "MID" and "PID" only read/write max 16 character from address 0 to 135 depends on the initial setting.
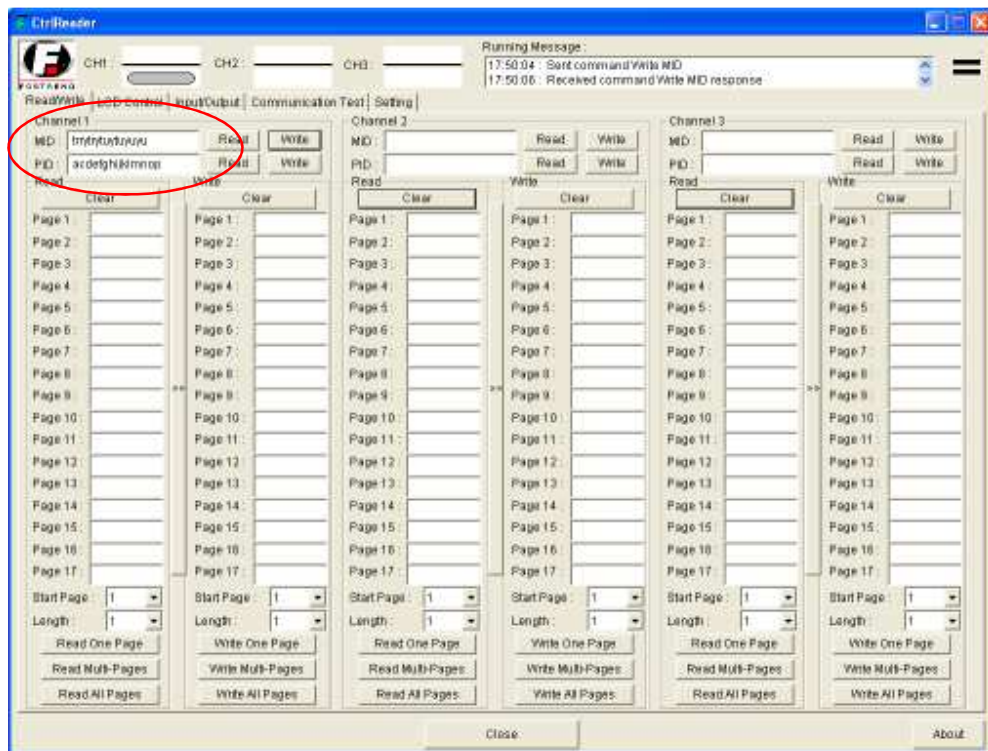
Note: Compare style of reading data between "MID & PID" and all pages. If both of initial setting of MID and PID are same.
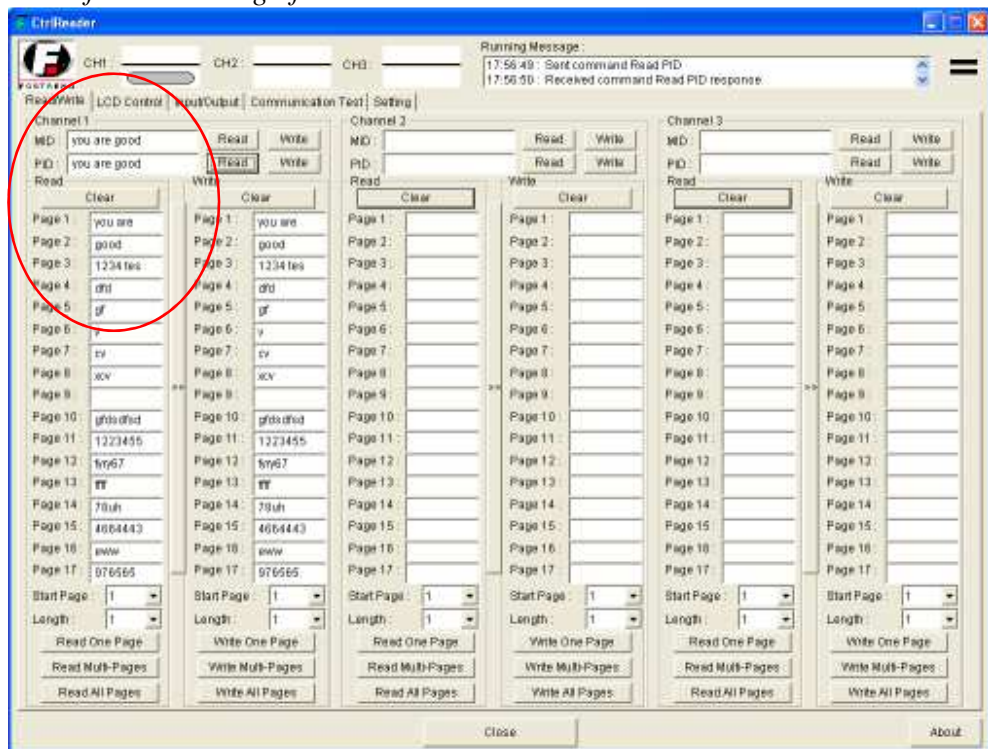
9. there are no "clear" button to perform clear old data at the box of "MID" and "PID"; using "delete" button on keyboard to clear old data during test "Read" or "Write".
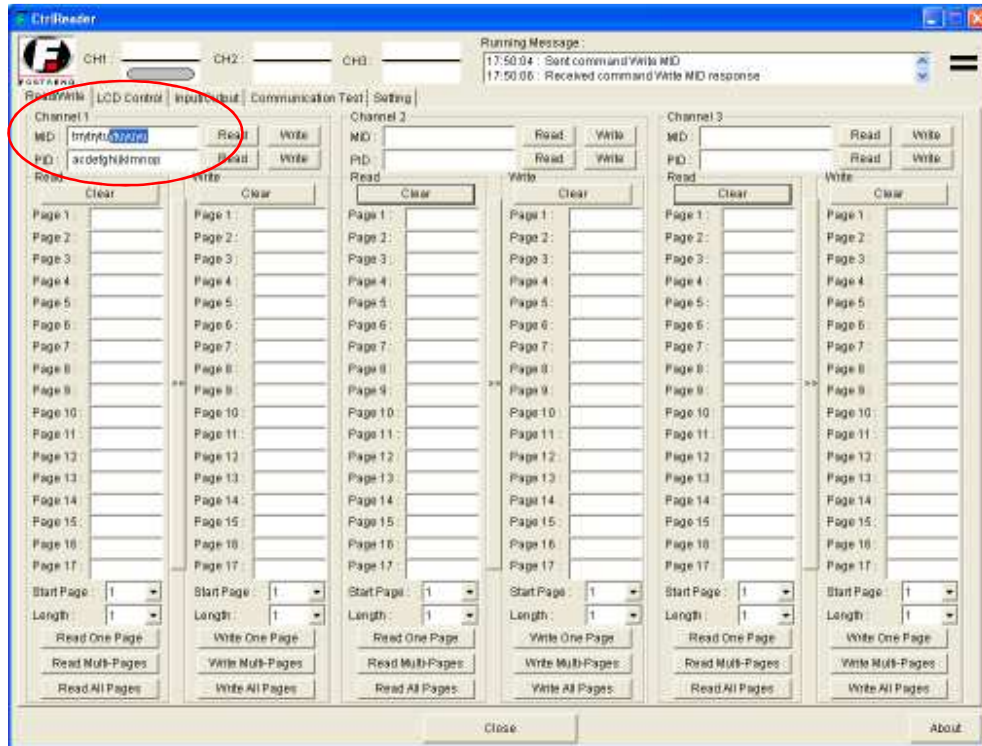
10. Type new data on the box of "Write", and then click the "Write "icon. Wait for the response message from the "Running Message" window, as same as step "6".
11. Click the "Read" icon, the "WRITTEN" data disappear a second (if not clear all data after processing "write"), and show the data again. Those data should be match.)
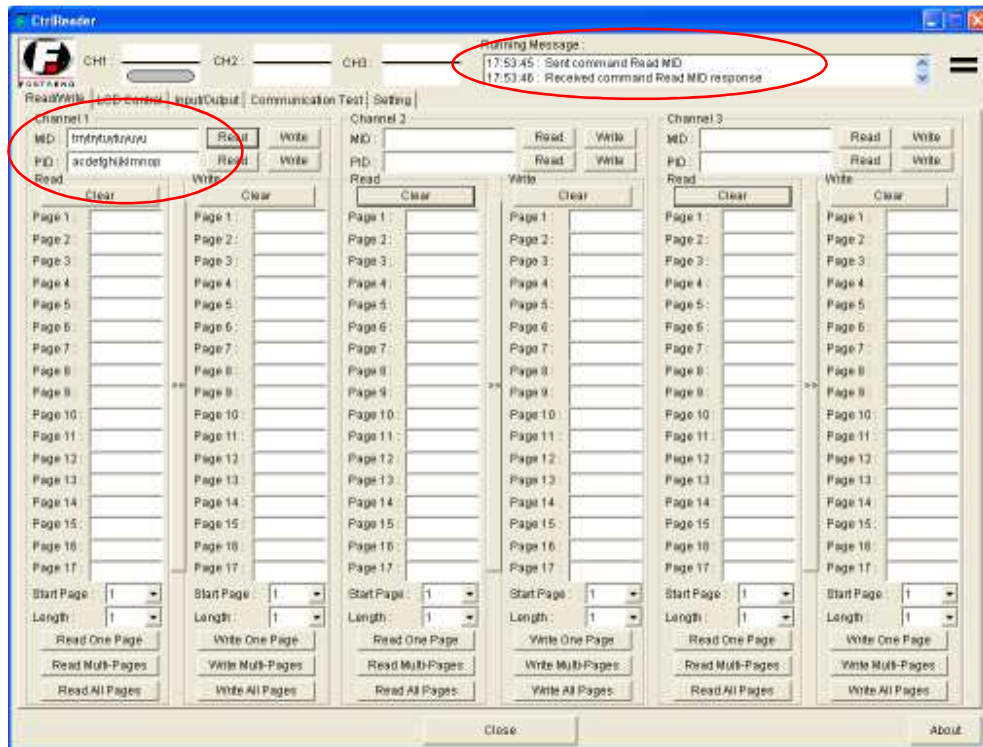
12. Continue to test few times to make sure that is no error.

1.3 Multi Channel

1.3.1 Hardware Setup

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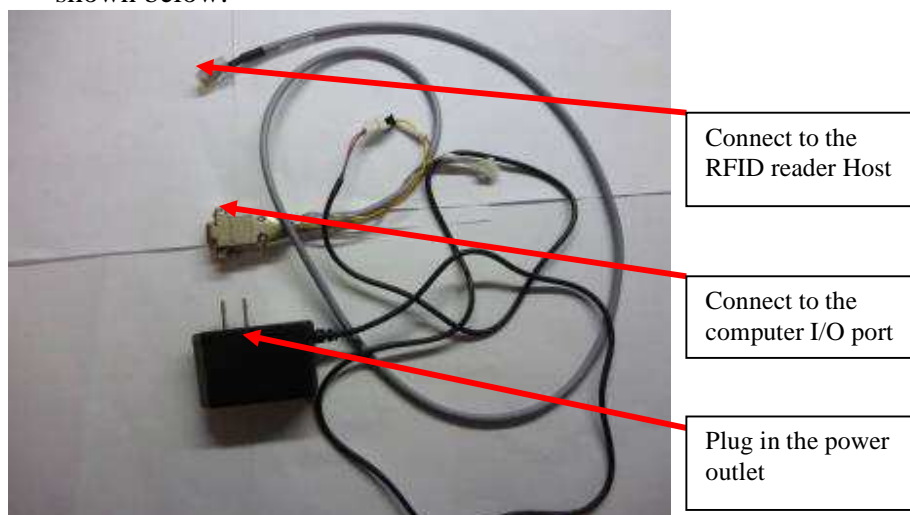
Connect to the RFID reader Host

Connect to the computer I/O port

Plug in the power outlet

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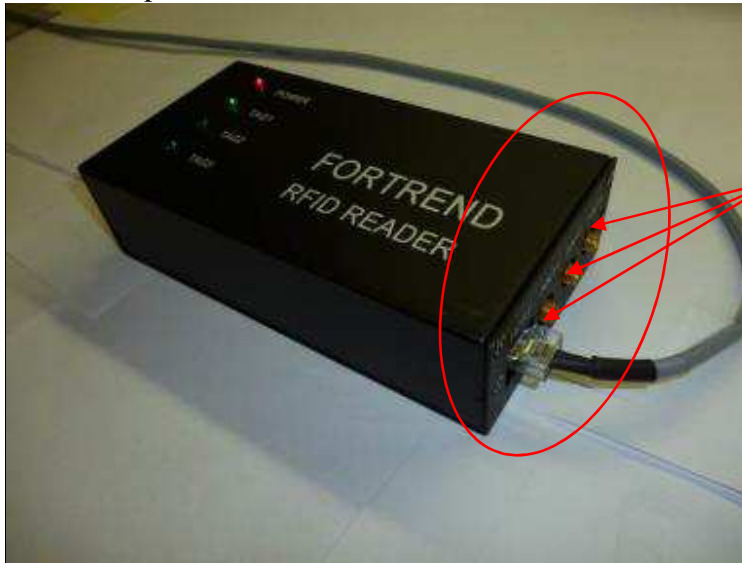

Allow to hook up three antennas at the same time.

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.

1.3.2 Start CtrrlReader

    a. Open operation software "CtrlReader.exe".
    b. The screen of operation page will be on as below
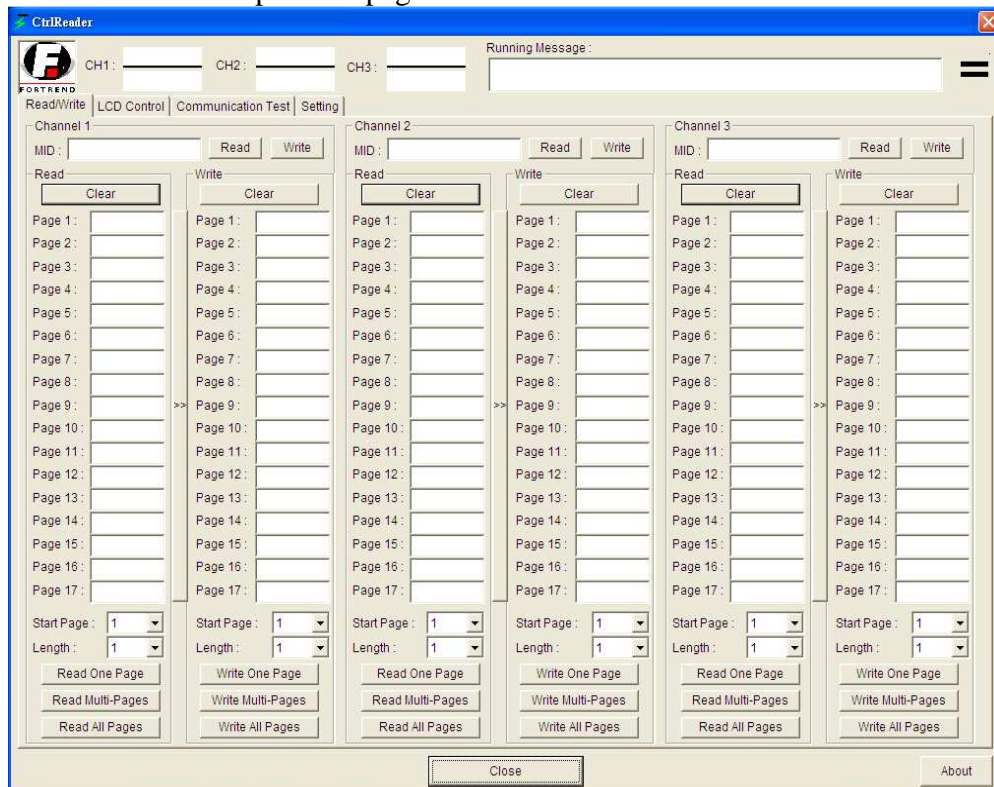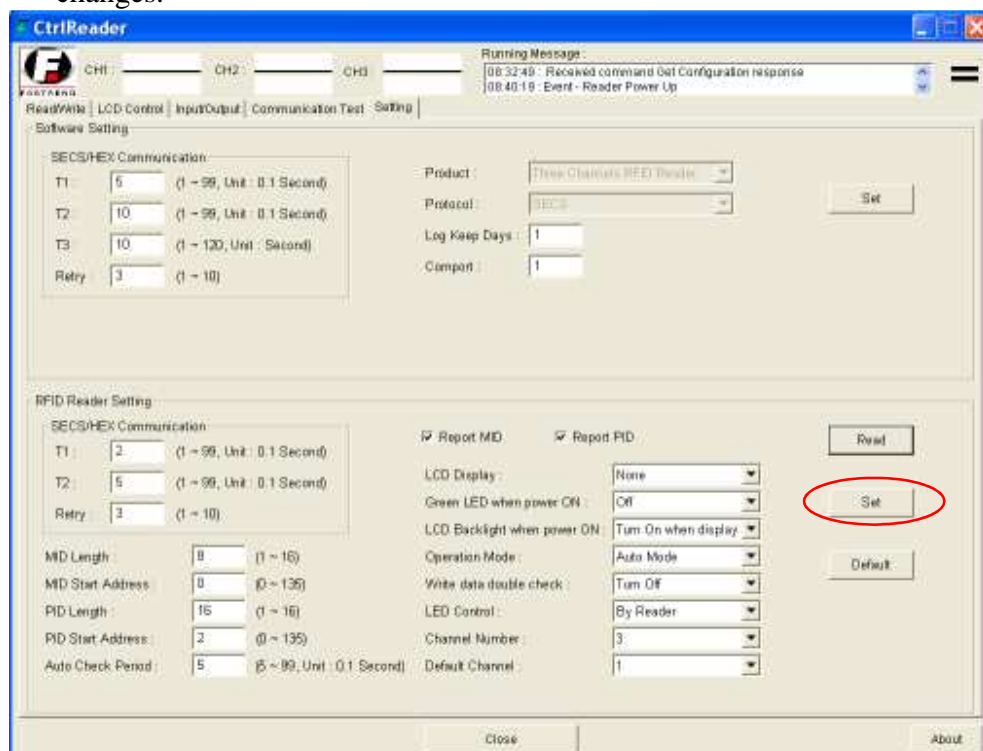
c. Click the "Setting" icon on the tool bar.
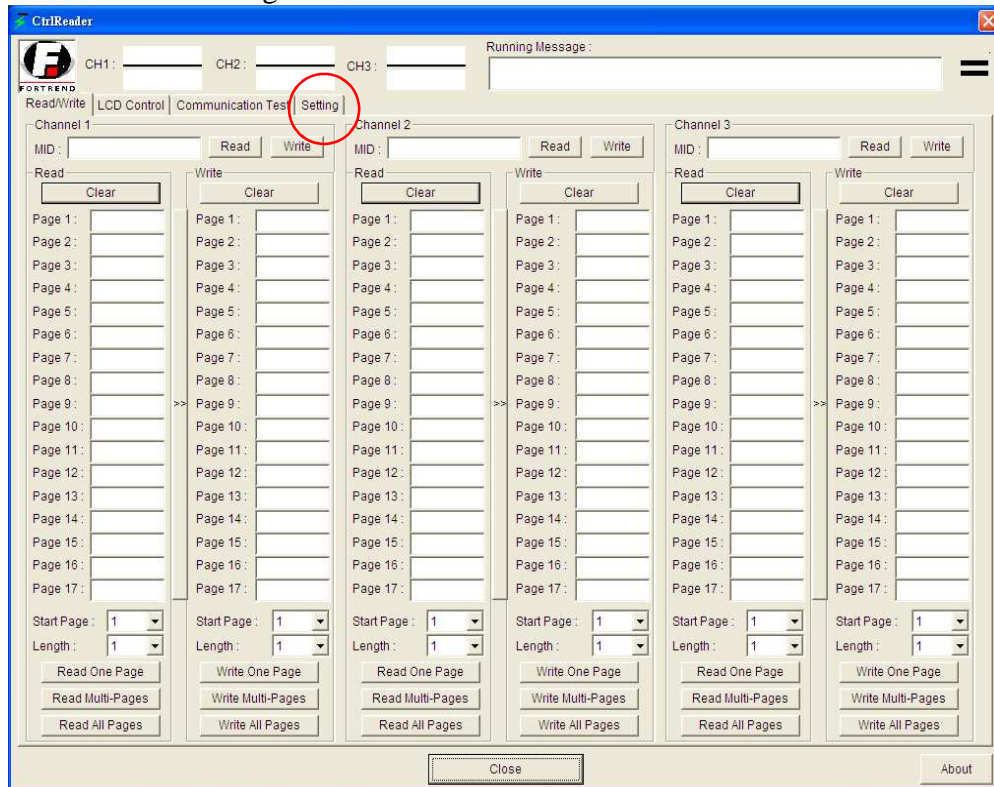
d. Click "Read" icon in order to check the default setting of RFID board. The page of "Setting "should be on as below.
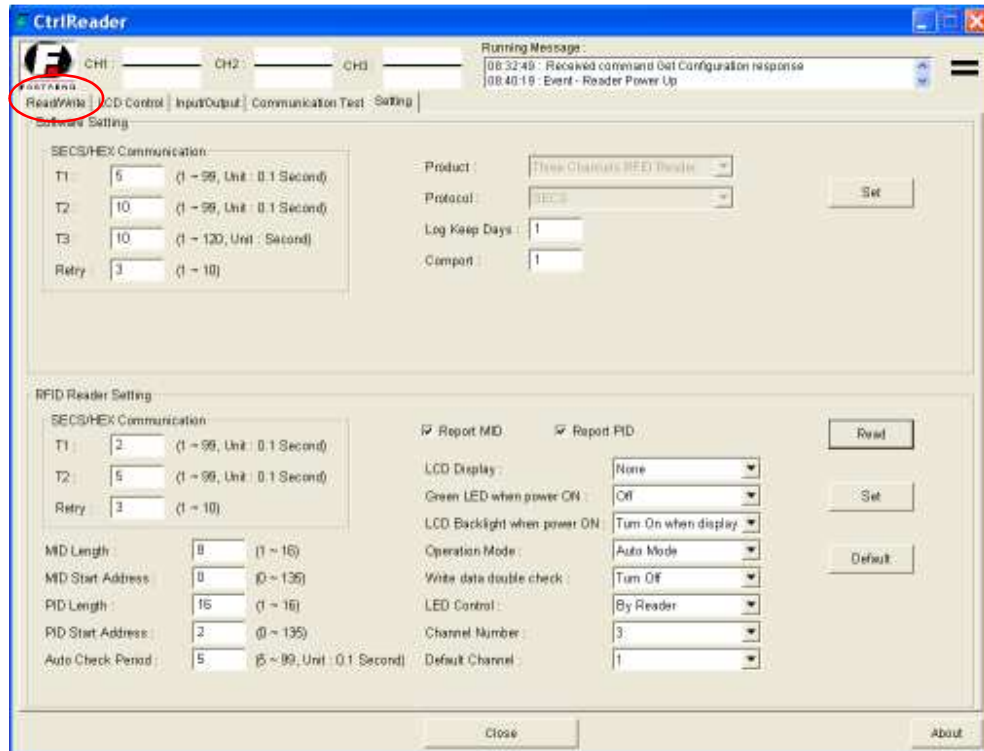*Note: Number of Channel should be "3" (maximum channels setting).*
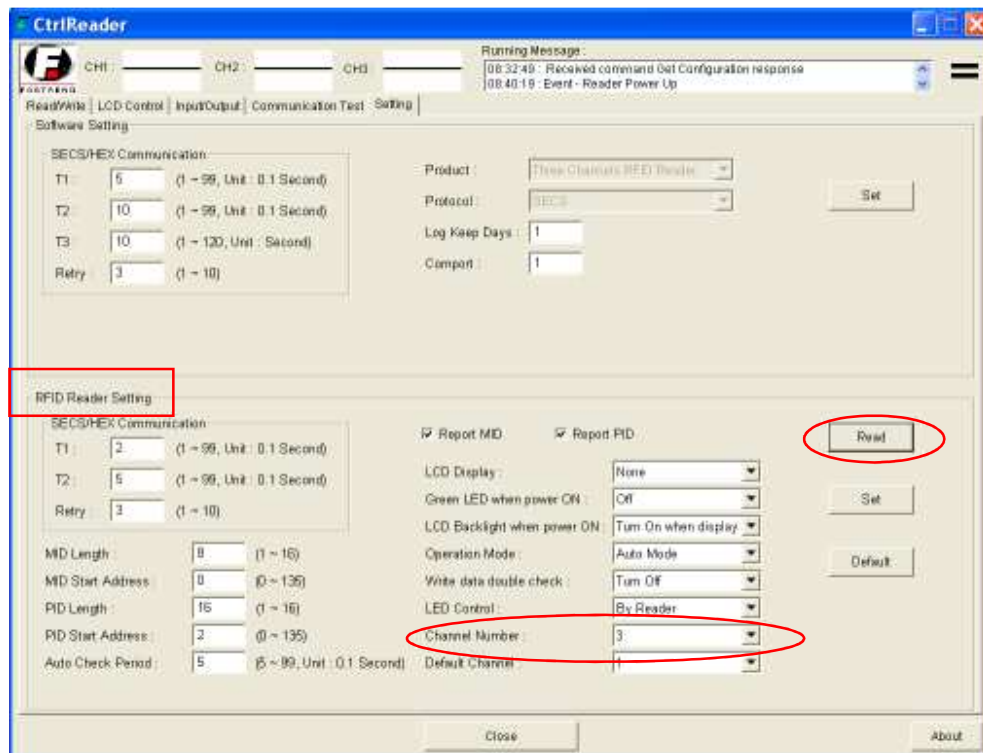
e. If the setting is not correct or not match to the customer's specification, make a change at particular item box, and then click "Set " to save all changes.
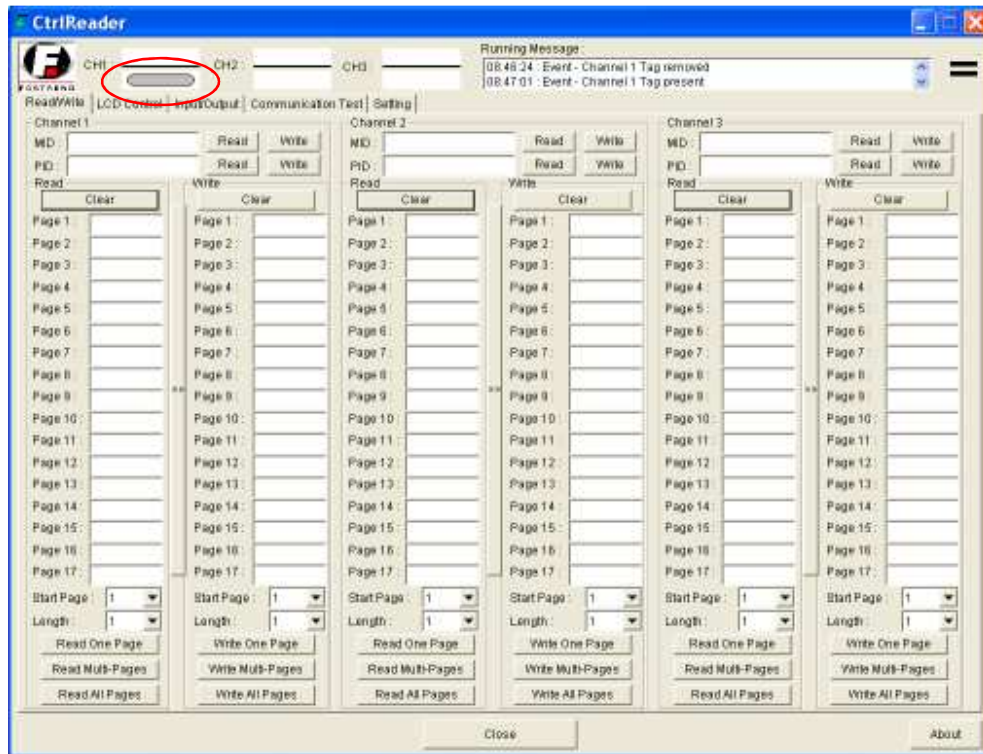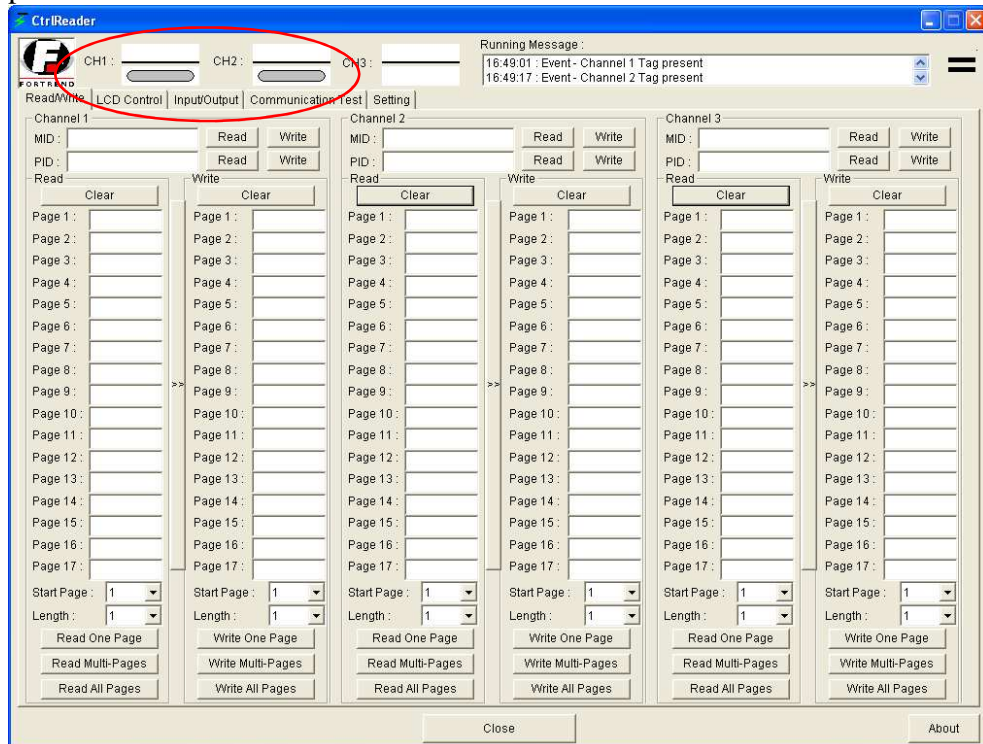
1.3.3 Read/Write Demo

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

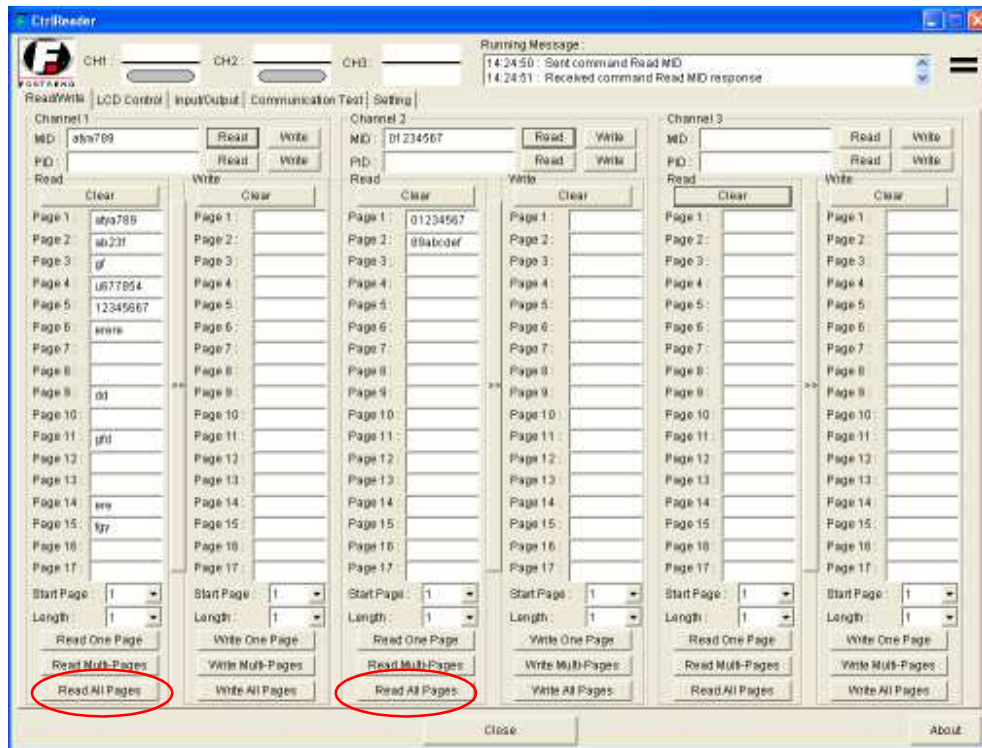2. Place tag next to the antenna, the status of channel would indicate and display as below.

If more than one channel occupied, indicator will show all status "ON" as picture shown below
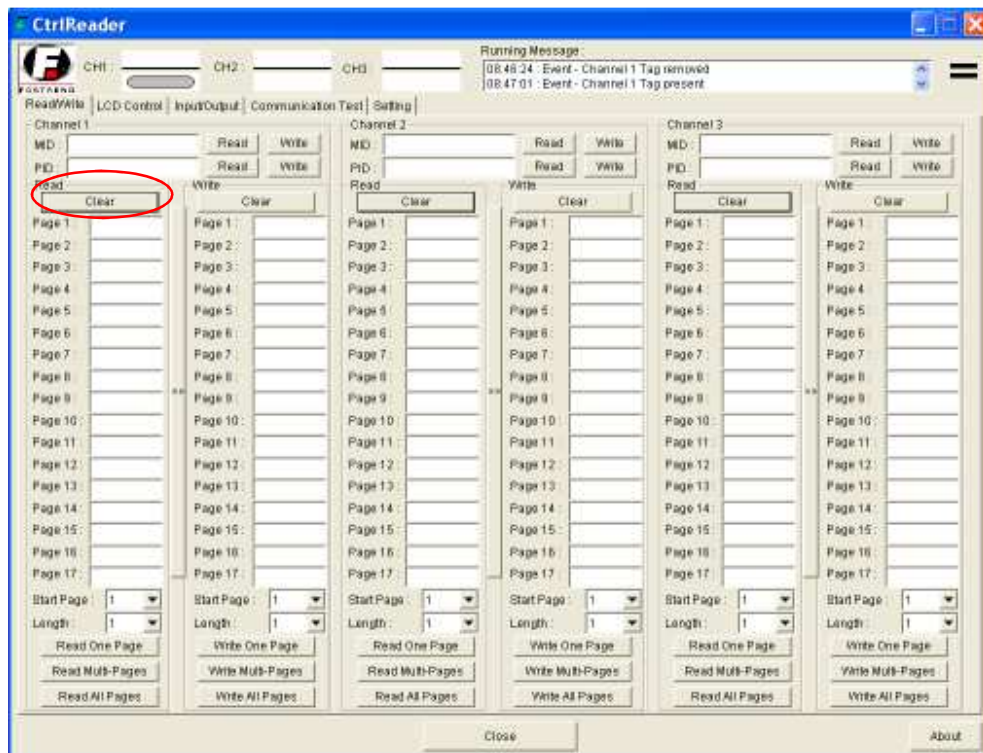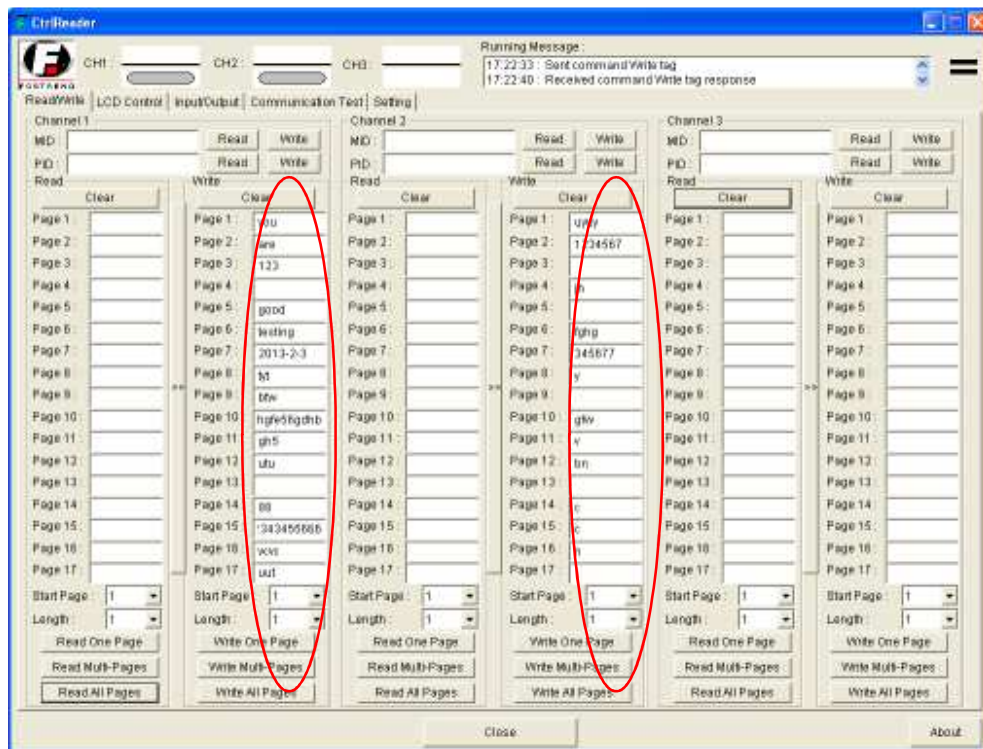
3. Click "Read All Pages" icon on relevant Channel that connected the antenna. The channel should display data on box of each page.

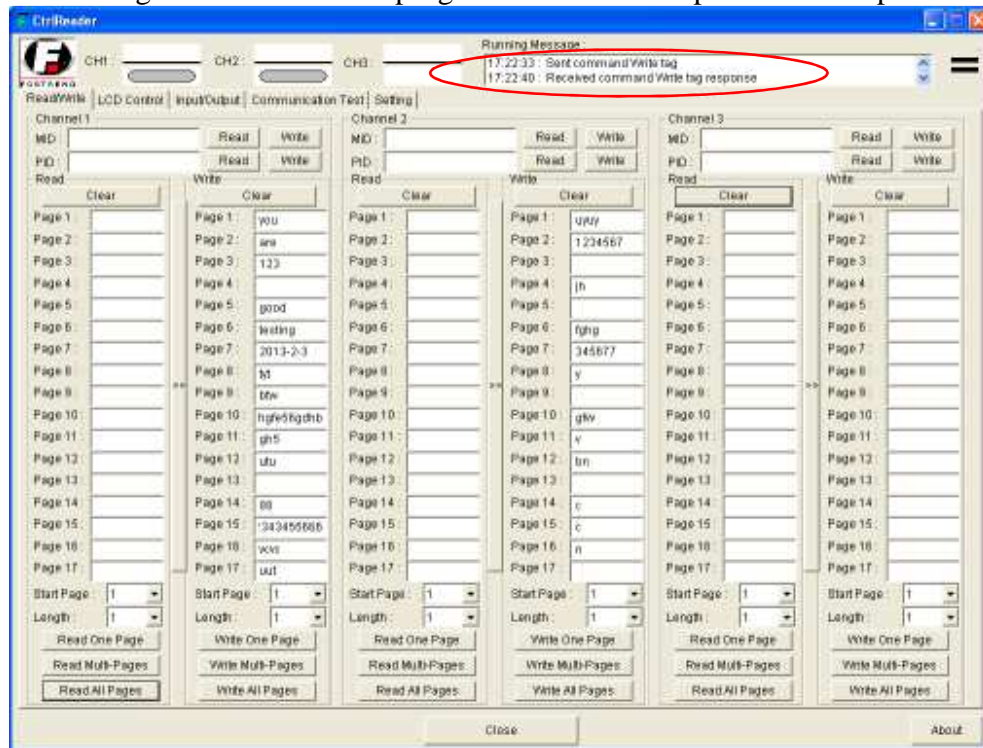4. Click "Clear" icon in order to clear all data before performing "Write".

5. Type new data on the data box for "Write" from page 1 to page 17 at different channels

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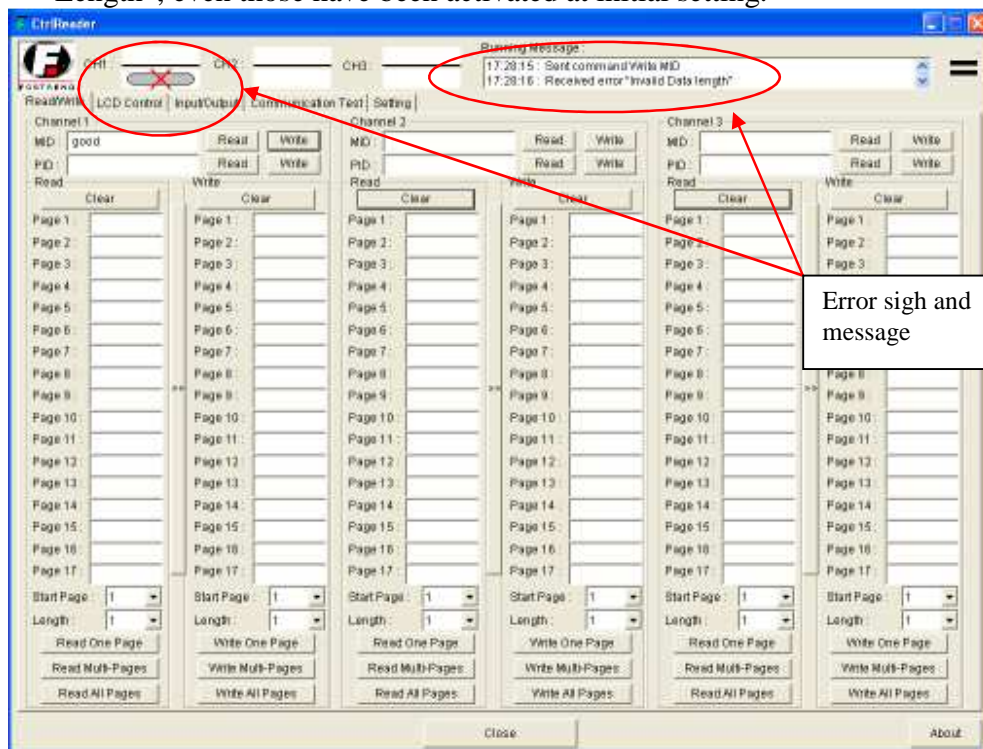   Message" window at the top right corner when the process is completed.

7. Click "Read All Page" in order to verify the new data, those should be
   match to all data of "Write".
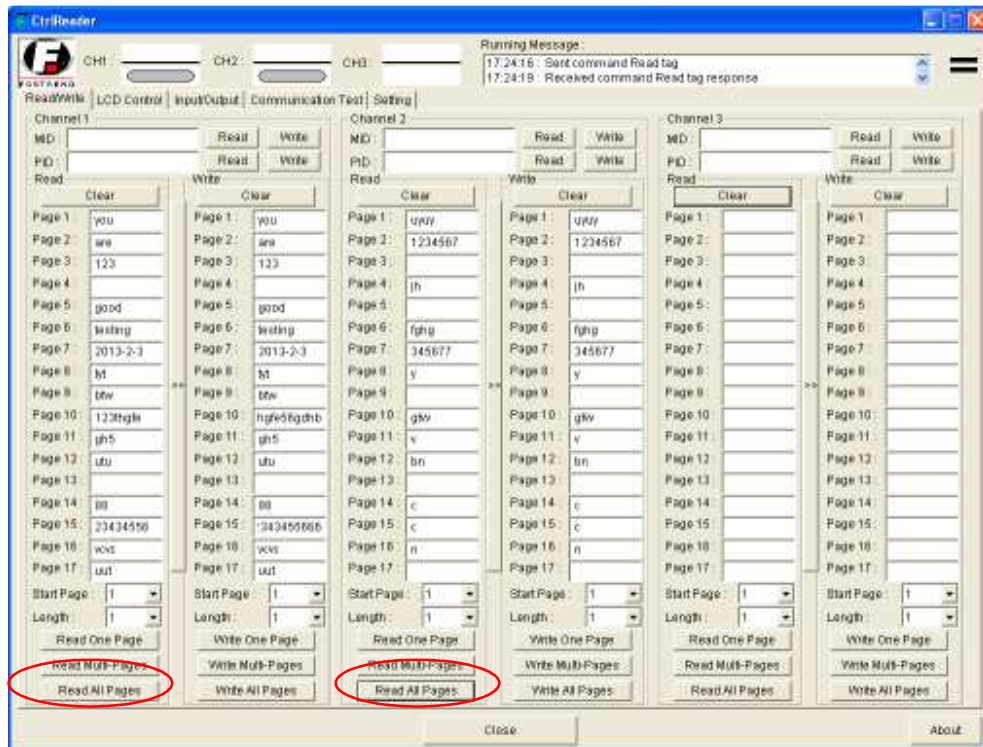
8. "Write" is not applicable at "MID" and "PID" because of "Invalid Data Length", even those have been activated at initial setting.
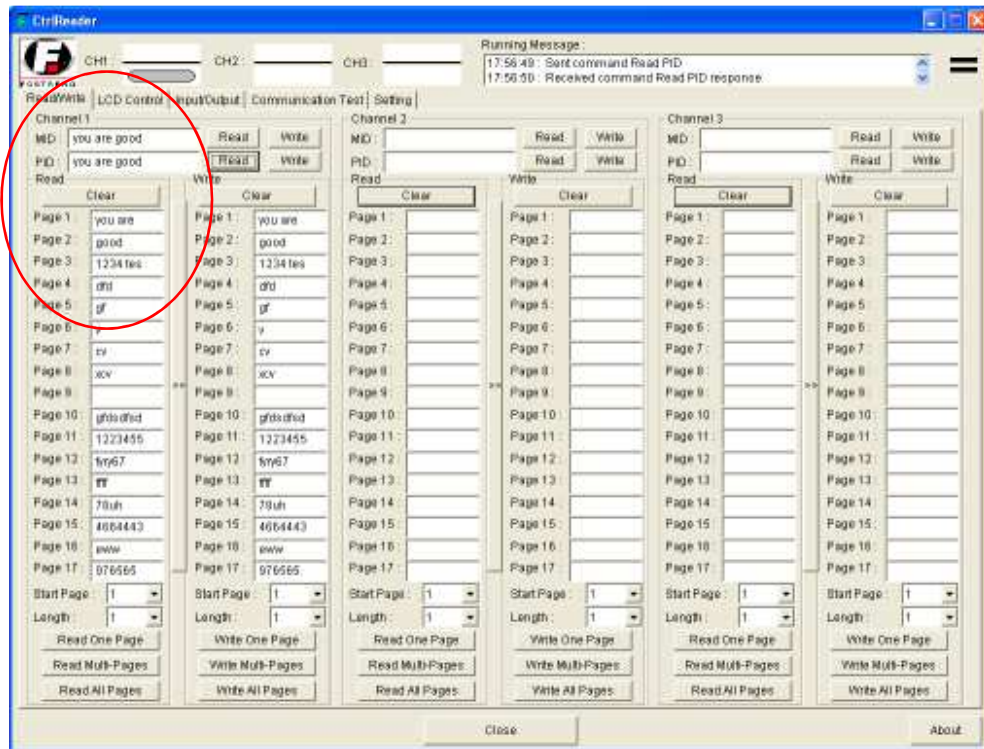

Error sigh and message

9. OR, individually click 'Read' icon on relevant 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 max 16
   character from address 0 to 135 depends on the initial setting.
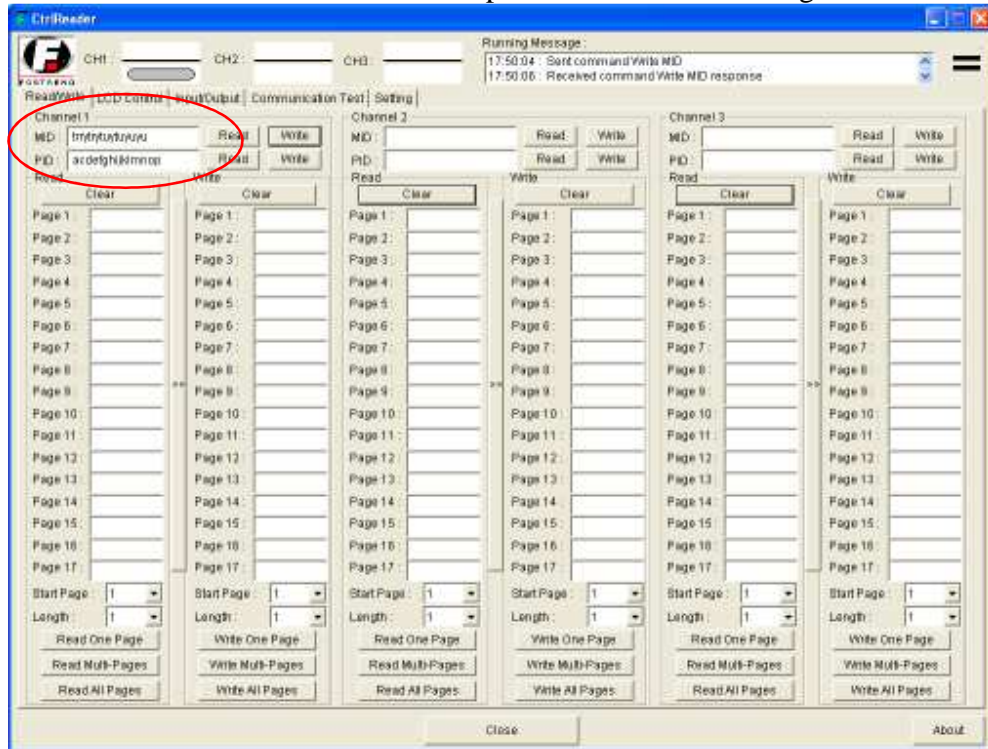
*Note: Compare style of reading data between "MID & PID" and all pages. If
both of initial setting of MID and PID are same.*

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