WDAS

Wireless Data Acquisition and Control System

W110A

User's Manual

Ver 2.0

SEBINE Technology, Inc.

CONTENTS

1. Summary

1.1 Product Introduction

W110A is one of WDAS(Wireless Data Acquisition and Control System) products and it is a wireless data transmitter-receiver which receives digital and analog input data for controlling signal by using 433MHz RF frequency bandwidth. W110A allows users to set only PC MODE, and communication channels via environment setting. Usable frequency number, channel number, and serial number are printed in shipping products.

Figure 1. W110A

1.1.1 Application examples

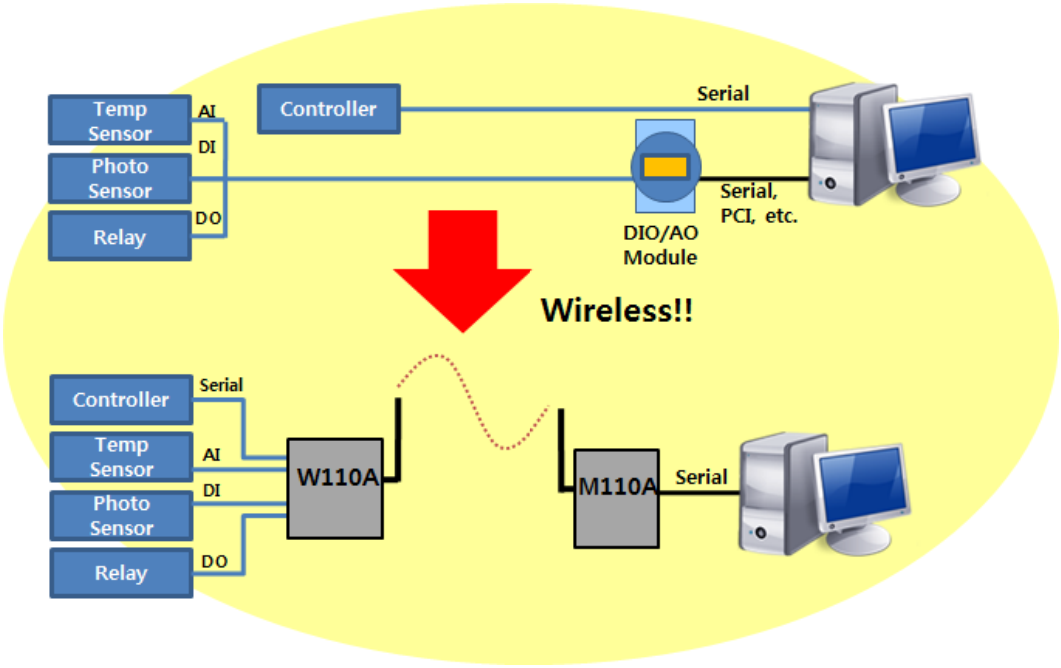


Figure 2. Application examples

1.1.2 Product usage

- Cable system replacement : Maintenance difficulty with cables is solved
- Hard environment for cable installation : Environment that requires long and complicated cable installation is solved
- Uneasy area for data acquisition by cable : Outdoor tank monitoring system

1.1.3 Product application area

- Pump, pipeline, liquid flow monitoring system
- Tank level, temperature monitoring system

1.1.4 Product parts

W110A main body, one λ/4 dipole antenna, one power connector

1.2 Specification

Item	Specification	
Name	W110A	
Dimension	105mm(L)×212mm(W)×34mm(H) (w/o Antenna)	
Housing	Aluminum	
Weight	510g (w/o Antenna)	
Power Supply	+9 ~ 35Vdc ±10%, Reverse Power/Overvoltage/Overcurrent Protection	
Current Consumption	Max 1.04W (@24Vdc)	
Operating Temperature	-10℃ ~ +70℃	
RF Features	. Frequency : 433.050MHz ~ 434.790MHz . Channel Spacing : 25KHz . Transmitter Power : 10mW . Receiver Sensitivity : -116 ~ -120dBm(-116dBm typ.) . Modulation : FSK . Bandwidth : < 14KHz	
Performance	. Expected Line-Of-Sight Range : Up To 1.5km with λ/4 Dipole Antenna . RF Data Rate : 4.8K Baud, 7.2K Baud	
I/O Interface	Serial	. Serial Communication Basic Setting : Data Bit 8bit, No Parity, 1 Stop Bit . User Selectable Baud Using DIP Switch : 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 . 9Pin D-SUB Female Connector
	Digital Input	8Ch. Opto-Isolated Input : Up To 2500Vrms Max. 50mA for Each Channel
	Digital Output	8Ch. NPN Open Collector Output Max. 50V and 500mA for Each Channel
	Analog Input	5Ch. Analog Input, with 10Bit Resolution . CH #0 : Voltage (0~5V or 0~10V) . CH #1~#3 : Voltage or Current selectable . CH #4 : Current (0~20mA)
Antenna Interface	. SMA Connector . Impedance 50Ω	

Table 1. W110A Specification

2. Operation Mode

W110A can use only PC MODE. Refer the Programmer guide for detailed protocol and Function Code.

2.1 PC MODE

2.1.1 Definition of PC MODE

Through M110A(PC MODE), W110A(Only PC MODE) with serial port, W110A execute the command when valid Function Code is received.

- Valid receiver Function Code : WRITE, WRITE_SERIAL, READ, STATUS_READ

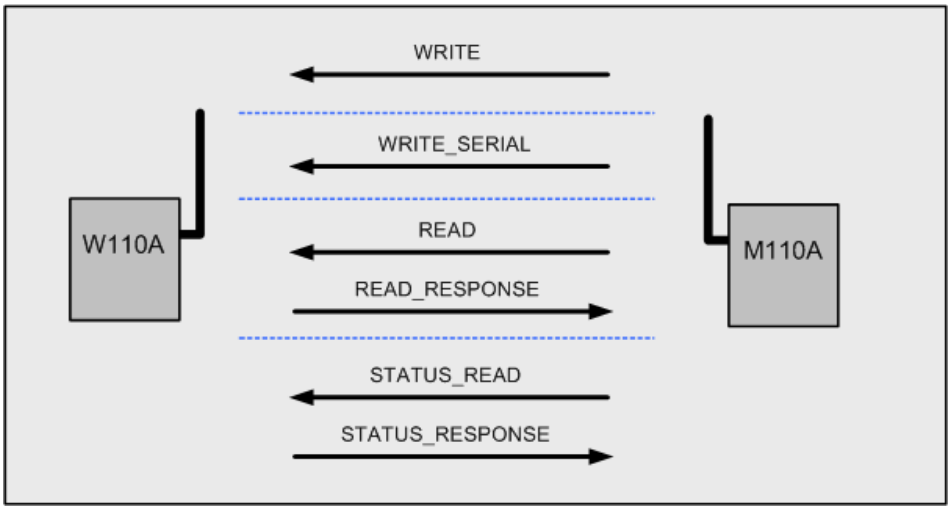


Figure 3. PC MODE of W110A

2.1.2 Function Code available at PC MODE

- WRITE : Through M110A(PC MODE), W110A(Only PC MODE) with serial port, digital output signal is generated when W110A receives digital output Function Code.
- WRITE_SERIAL : Transmit serial data to RF MODEM or W110A where serial port is available
- READ : Through M110A(PC MODE), W110A(Only PC MODE) with serial port, current analog input status is read when W110A receives Function Code of inquiry of analog input status.
- READ_RESPONSE : Function Code of READ_RESPONSE is used when READ Function Code is received and current analog input status is transmitted.
- STATUS_READ : Through M110A(PC MODE), W110A(Only PC MODE) with serial port, W110A reads current data output status when W110A receives Function Code of inquiry of digital output status.
- STATUS_RESPONSE : Function Code of STATUS_RESPONSE is used when

STATUS_READ Function Code is received and current digital output status is transmitted.

2.1.3 Environment setting list before PC MODE use

- None

3. Device Connection

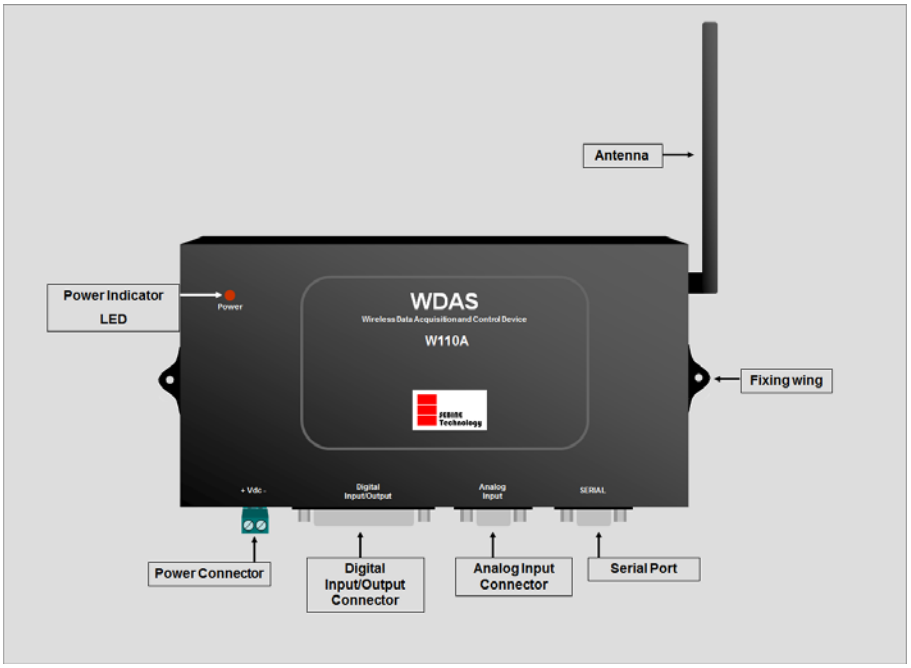


Figure 4. W110A Outer

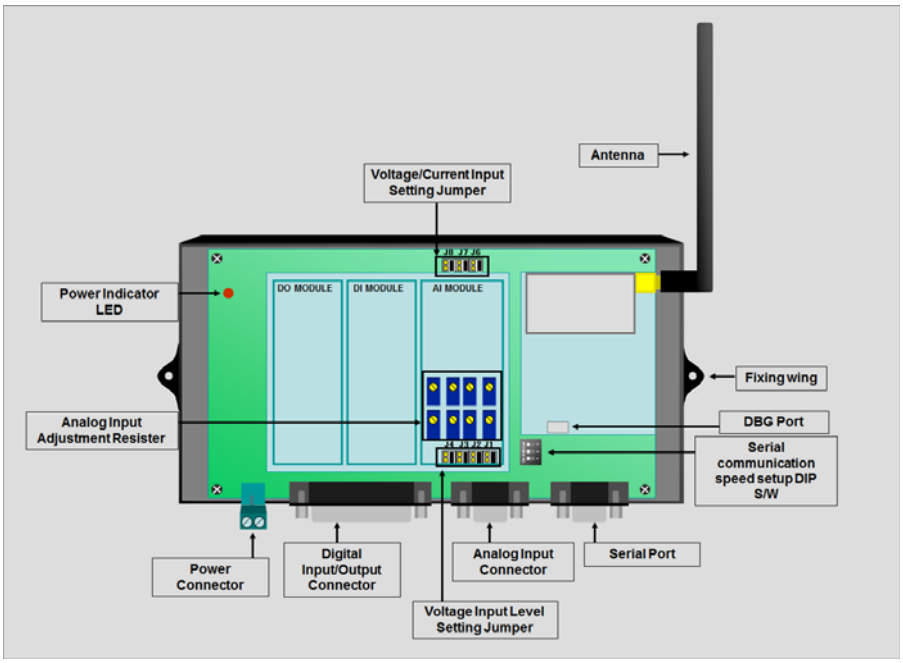


Figure 5. W110A Inner

3.1 Power Supply

W110A works at +19~35Vdc and equipped with Reverse Power / Overvoltage / Overcurrent Protection circuitry. Power is supplied by power connector provided at product purchase as shown in figure below. W110A has no external power switch and it becomes in working mode when the power is supplied. If normal power is supplied, power supply indicator LED is on.

a. As shown in Figure 6, remove the skin of wire about 7mm and put it into the terminal and tighten it by turning the left screw using screwdriver.

b. As shown in Figure 7, connect it to power.

c. As shown in Figure 8, connect the terminal to power port of W110A, Make sure the direction is exact as shown in Figure 8.

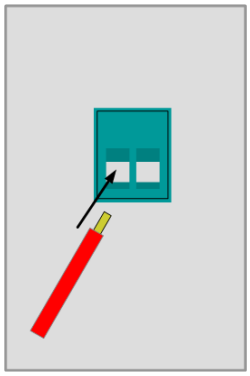


Figure6. Power Supply-1

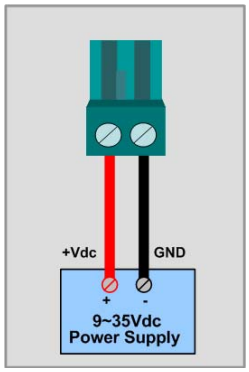


Figure7. Power Supply-2

Figure8. Power Supply-3

3.2 Digital Input/Output Connection

W110A supports 8 channel digital input, 8 channel digital output. For use of digital input/output function, Digital Input/Output connector is used shown in Figure 9.

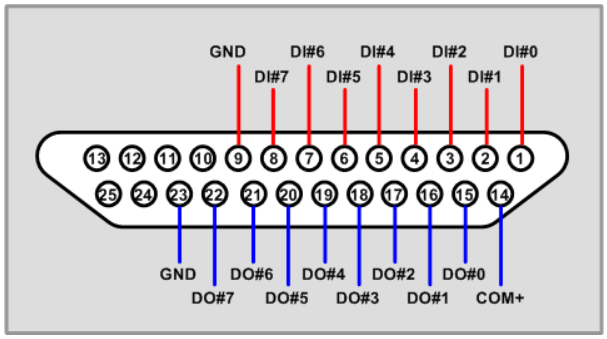


Figure 9. W110A connetor : DB-25 Female

3.2.1 Digital input channel connection

Digital input circuit of W110A is shown in Figure 10. Refer the circuit below for digital input channel connection.

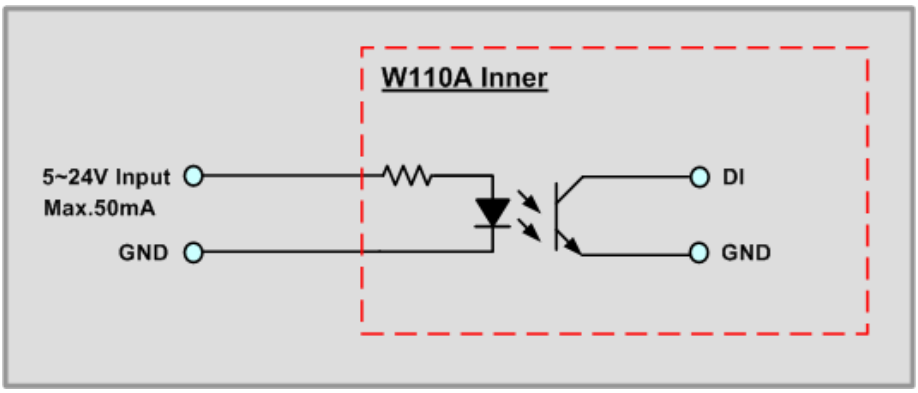


Figure 10. Digital input channel concept

3.2.2 Digital output channel connection

Digital output circuit of W110A is shown in Figure 11. Refer the circuit below for digital output channel connection.

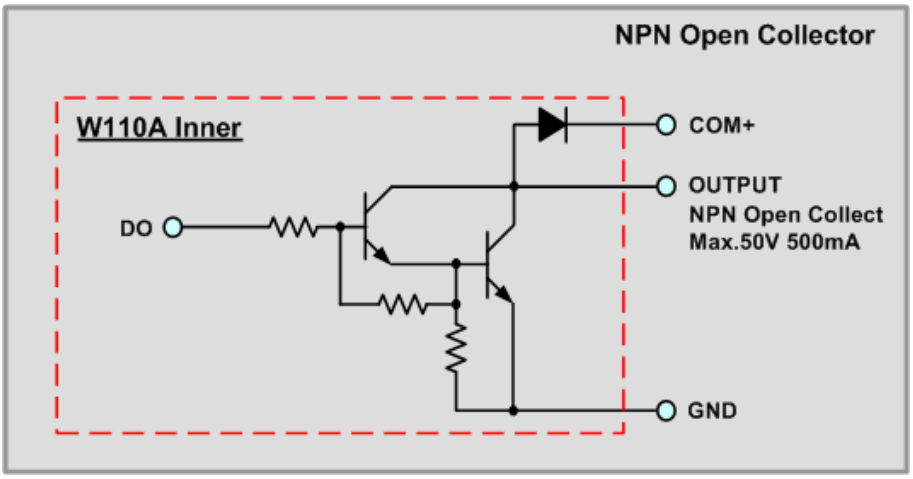


Figure 11. Digital output channel concept

3.3 Analog Input Connection and Setting

W110A supports 5 input channel. For analog input function, use Analog Input connector in Figure 12.

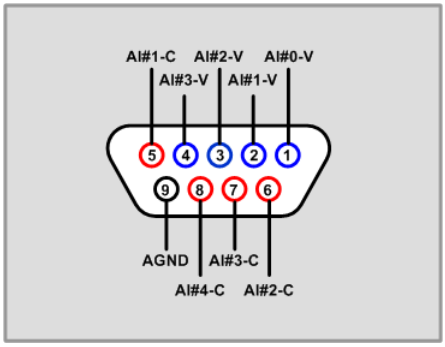


Figure 12. W110A connector : DB-9 Female

2.3.1 Analog input connection

Analog input channel generates input via the difference between AGND and corresponding analog input channel pins. Thus, the both ends of device that generates analog input should be connected to corresponding channel pins and AGND.

2.3.2 Analog input channel setup

For use of analog input, voltage input level setting jumper, voltage/current input setting jumper adjustments are needed as shown in Figure 5.

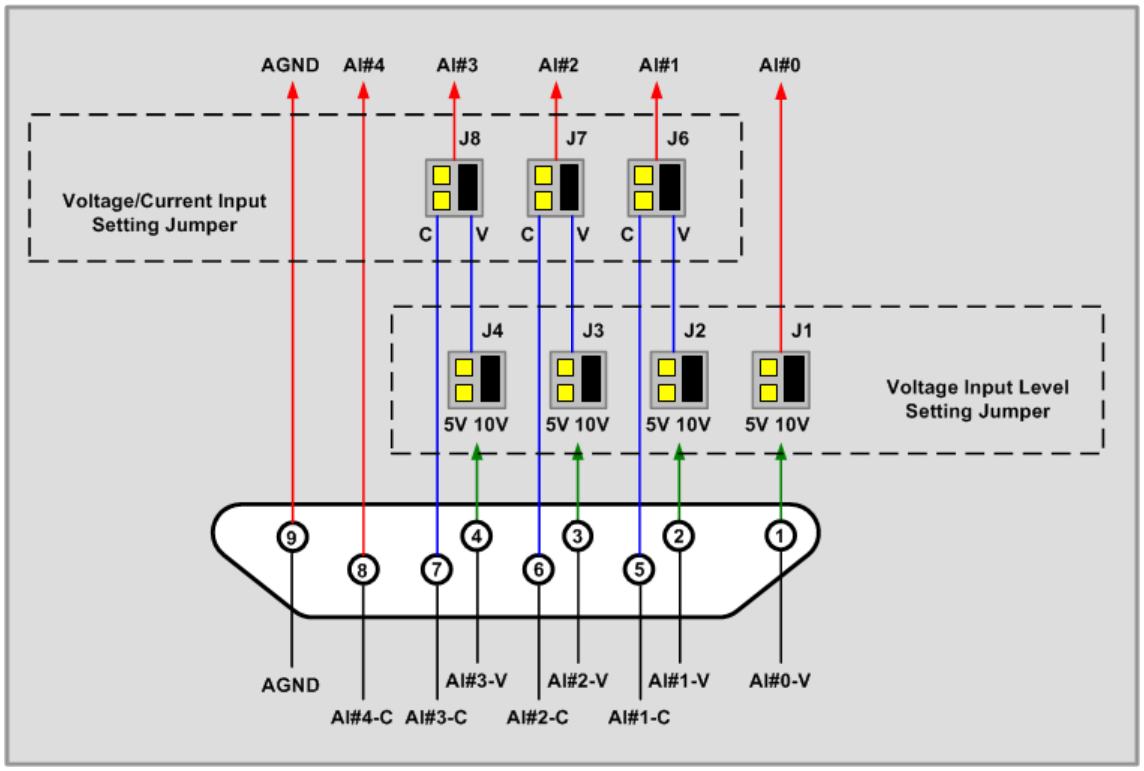


Figure 13. W110A analog input channel setting concept

AI#0 : AI#0 can voltage input receipt. Set the jumper of J1 adjust the voltage input range, then receive voltage via pin 1 of Analog Input connector.

AI#1 : AI#1 can select voltage/current input receipt. When receiving voltage, set the jumper of J6 as V and adjust the voltage input range, then receive voltage via pin 2 of Analog Input connector. When receiving current, set the jumper of J6 as C, then receive current via pin 5 of analog input connector.

AI#2 : AI#2 can select voltage/current input receipt. When receiving voltage, set the jumper of J7 as V and adjust the voltage input range, then receive voltage via pin 3 of Analog Input connector. When receiving current, set the jumper of J7 as C, then receive current via pin 6 of analog input connector.

AI#3 : AI#3 can select voltage/current input receipt. When receiving voltage, set the jumper of J8 as V and adjust the voltage input range, then receive voltage via pin 4 of Analog Input connector. When receiving current, set the jumper of J8 as C, then receive current via pin 7 of analog input connector.

AI#4 : AI#0 can current input receipt and it can receive current via pin 8 of Analog Input connector.

※Warning : Do not change the variable resistor shown in Figure 5.

3.4 RS232 Communication Connection

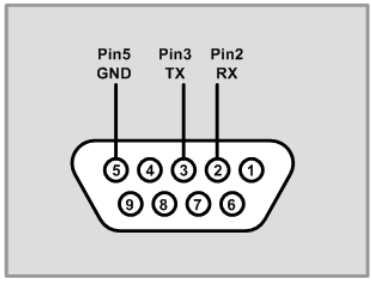


Figure 14. W110A Connector : DB-9 Female

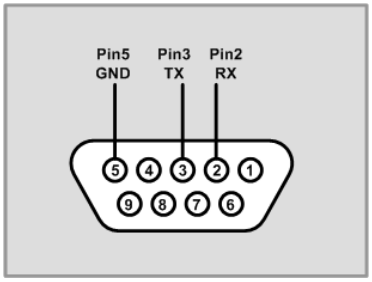


Figure 15. PC Connector

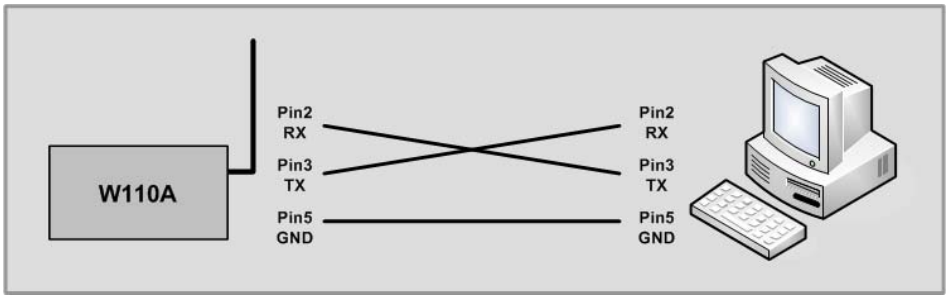


Figure 16. Connection of W110A and PC

3.5 Serial communication speed setup

W110A is able to adjust serial communication speed with DIP switch as shown in Figure 17. Serial communication adjustment must be set before power is supplied. During the operation, if the communication speed is to be reset, DIP switch is set and then power should be OFF/ON afterward.

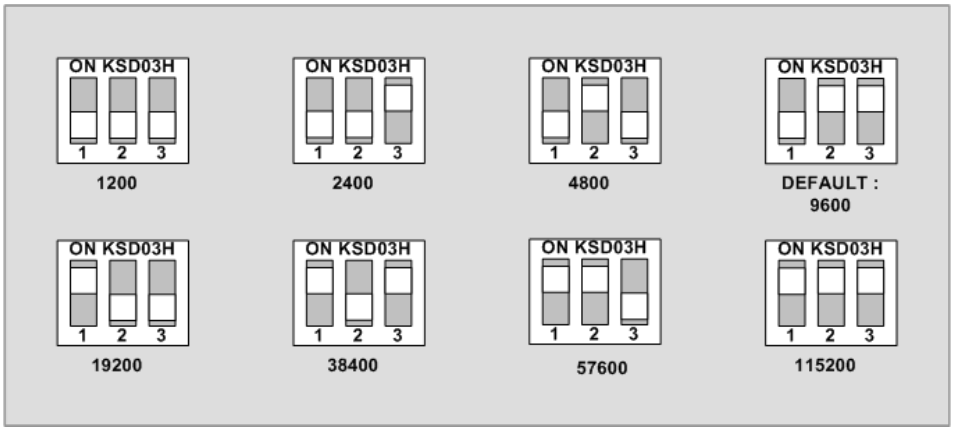


Figure 17. Communication speed adjustment with DIP switch

3.6 Antenna connection

Connect the SMA-P(male) connector antenna to SMA-J(Female) connector of W110A. At purchase, λ/4 dipole antenna is provided.

Figure 18. SMA-J Antenna connector

4. Environment setup

Environment setup can be made through SetModemEnv.exe program. For details, consult the corresponding manual.

4.1 Hardware connection

Use DBG port for PC connection shown in Figure 5.

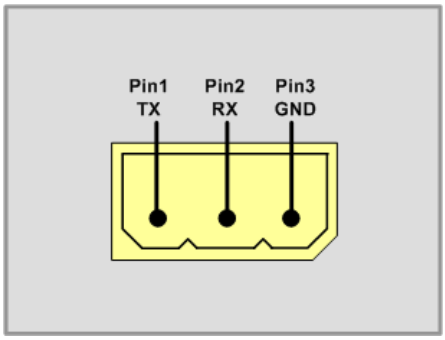


Figure 19. Hardware connection-1(W110A)

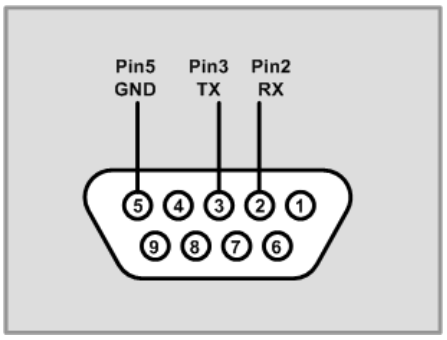


Figure 20. Hardware connection-2(PC)

For communication frequency adjustment, port and PC must be connected via serial communication program.

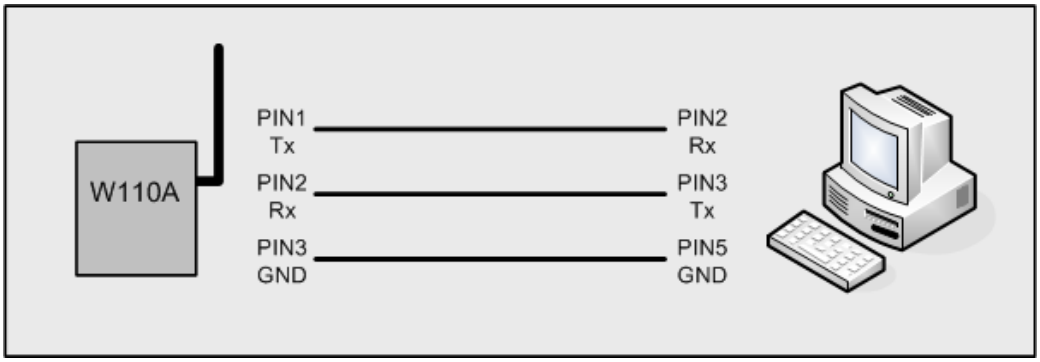


Figure 21. Hardware connection-3

The hardware connection between W110A and PC can be done as shown in Figure 21.

4.2 Setup list of each mode

4.2.1 PC MODE

- Channel Setting : Communication Frequency Setting
- Tx Power Level Setting : Communication RF Power Level Setting

5. Example

(EX. 1) M110A(PC MODE) to W110A(only PC MODE) Communication

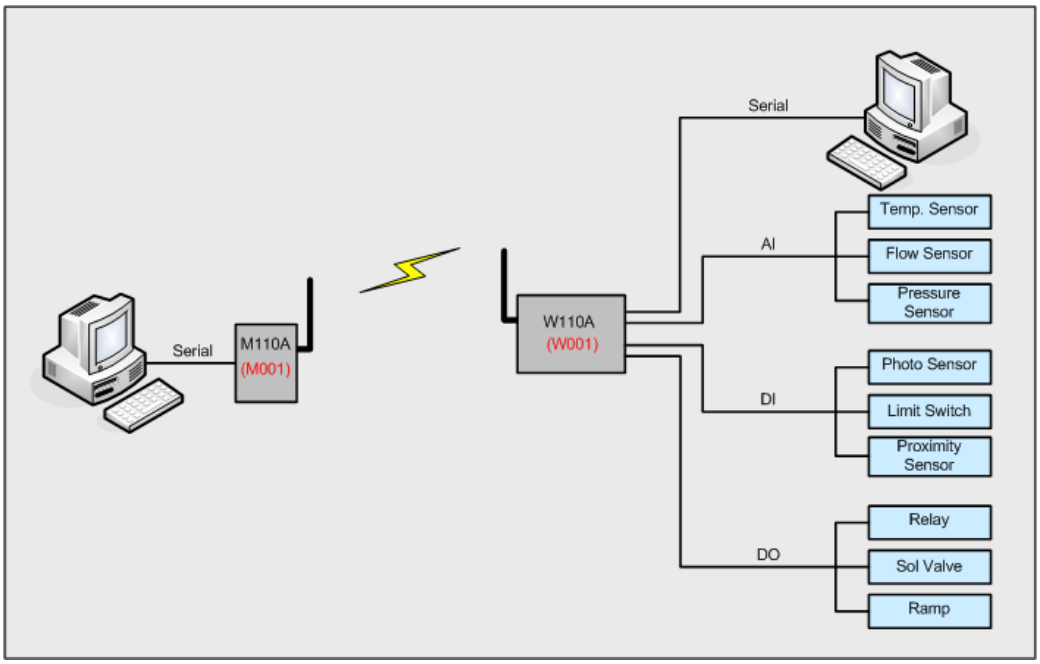
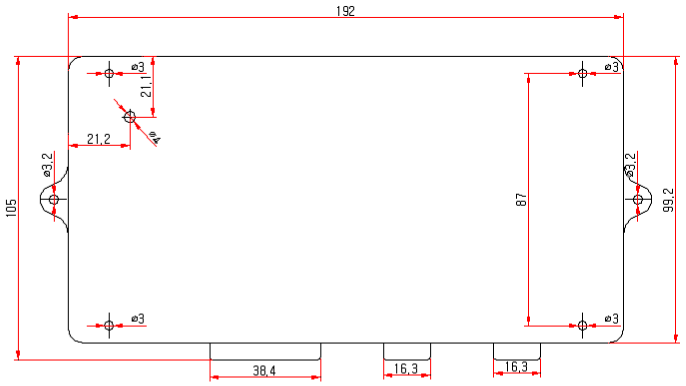
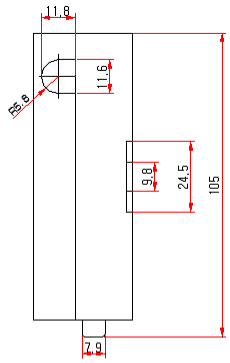
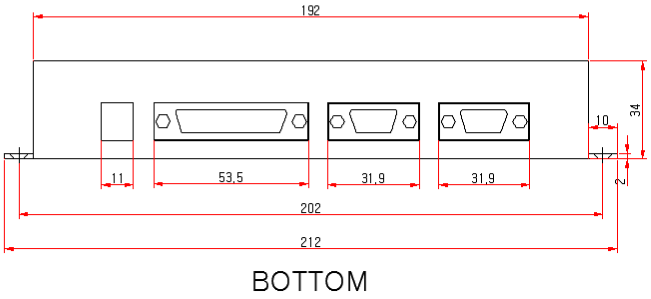


Figure 22. M110A to W110A Communication Example

Appendix 1. Dimension







Appendix 2. Document Information

Revision	H/W Version	Description
1.0	RF1-AE-BA Ver 1.0	03/30/2009 - Initial Release Version
2.0	RF1-AE-BA Ver 1.0	09/16/2010 - Modified

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