

ARDUINO and STD-601 Evaluation Kit **TB-STD601**



Operation Guide

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The TB-STD601 combines the STD-601 module with Arduino MEGA 2560 allowing you to develop your own Arduino code and control the STD-601 module. The kit allows download of a demonstration code and setting software in Windows to allow testing of the STD-601 module.

1. FEATURES

- Switching signal transmission tests using 4 switches and 4 LEDs.
 - One way transmission
 - Two way transmission
- Telemetry transmission
- Packet error test
- Displayed RSSI level on LCD
- Displayed noise floor RSSI level on LCD (when no signal)
- Connection to Arduino external ports for external circuitry
- Board software (set via USB)
 - Sample Arduino code
 - Setting software in Windows
- LCD screen

2. PART NAMES AND FUNCTIONS

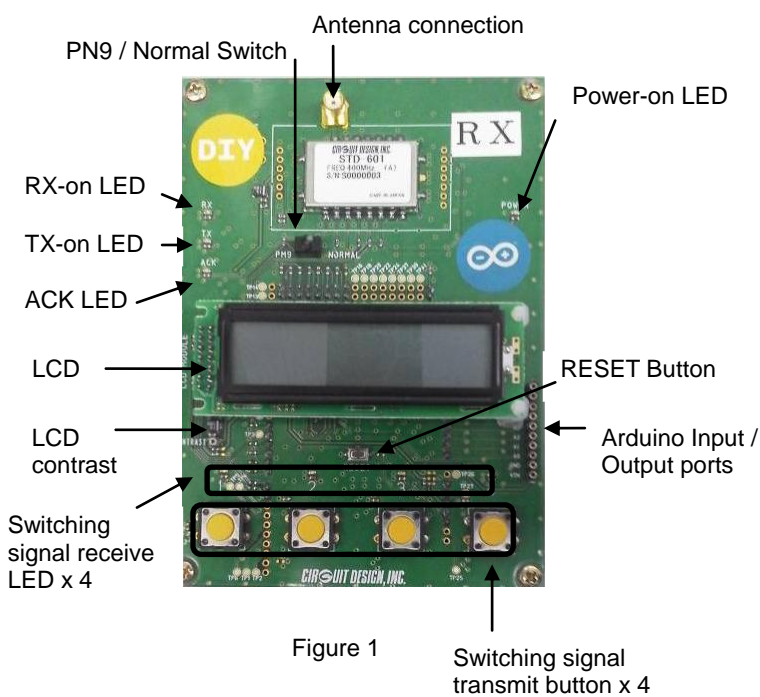


Figure 1

Switching signal transmit button x 4



Figure 2

3. BLOCK DIAGRAM

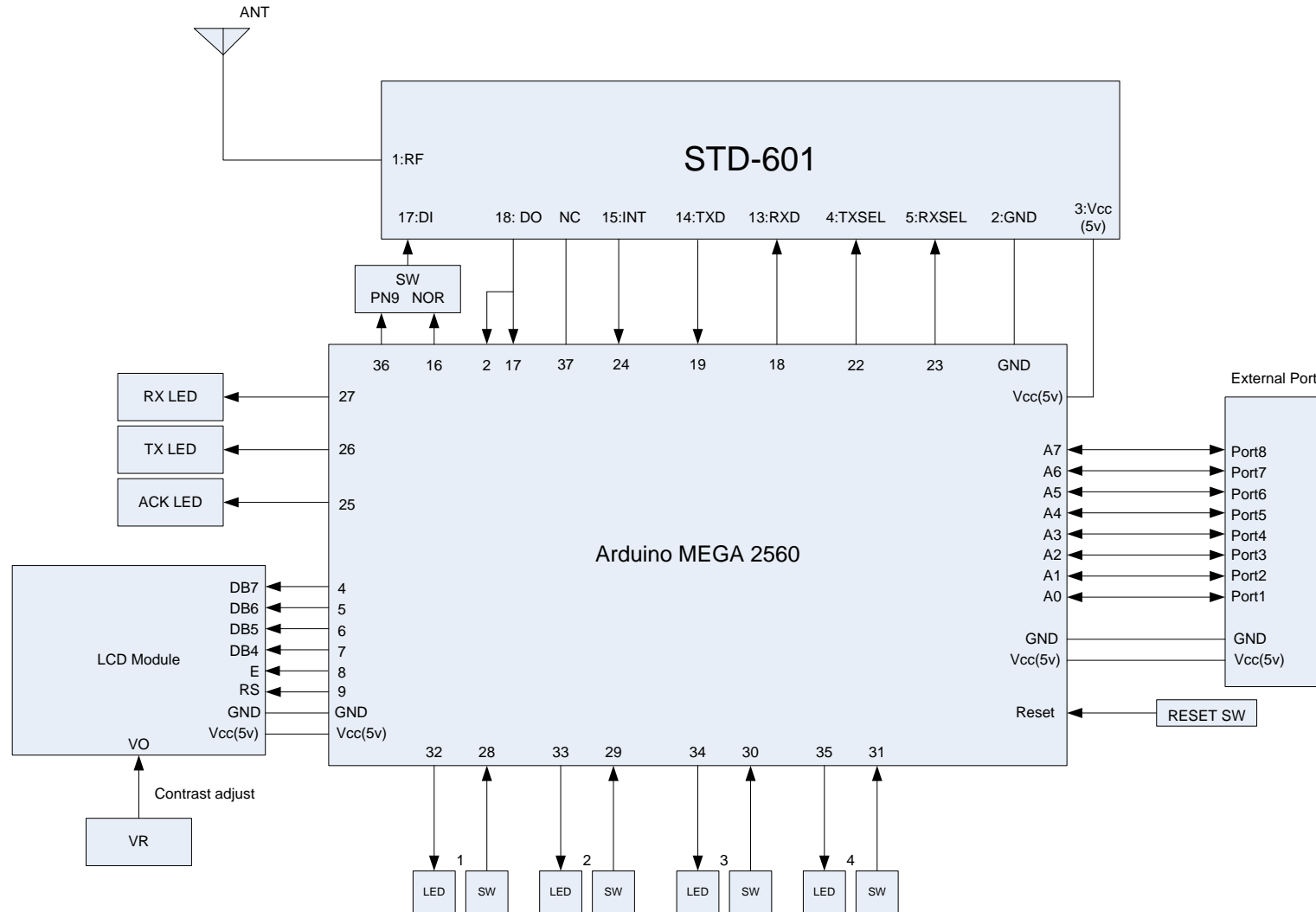


Figure 3

4. OPERATION RANGE

Item	Min.	Typ.	Max.	Unit
Supply Voltage	6	9	20	V
Supply Current (2-way cont. Vcc = 9V, RF 10mW, no port load)	-	130	-	mA
Arduino external input port voltage (A0-A7) High Level	3.5	-	5.5	V
Arduino external input port voltage (A0-A7) Low Level	-0.5	-	1.5	V
Arduino external output port voltage (A0-A7) High Level	-	5	-	V
Arduino external output port voltage (A0-A7) Low Level	-	GND	-	V
Arduino external analog input (A0-A7)	0	-	5	V

Table 1

5. Notice on the usage of the TB-STD601

The TB-STD601 is intended to be used for communication range tests of the STD-601. Do not use by installing in user's equipment.

6. How to setup

Setup the TB-STD601 as shown in figure 4 and apply 6 V to 20 V (9V norm.) to the power supply jack (see figure 4 for connection).

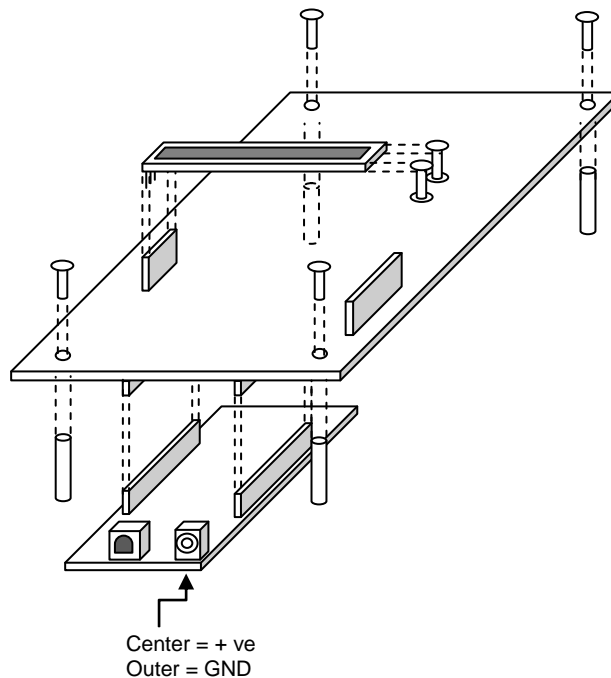
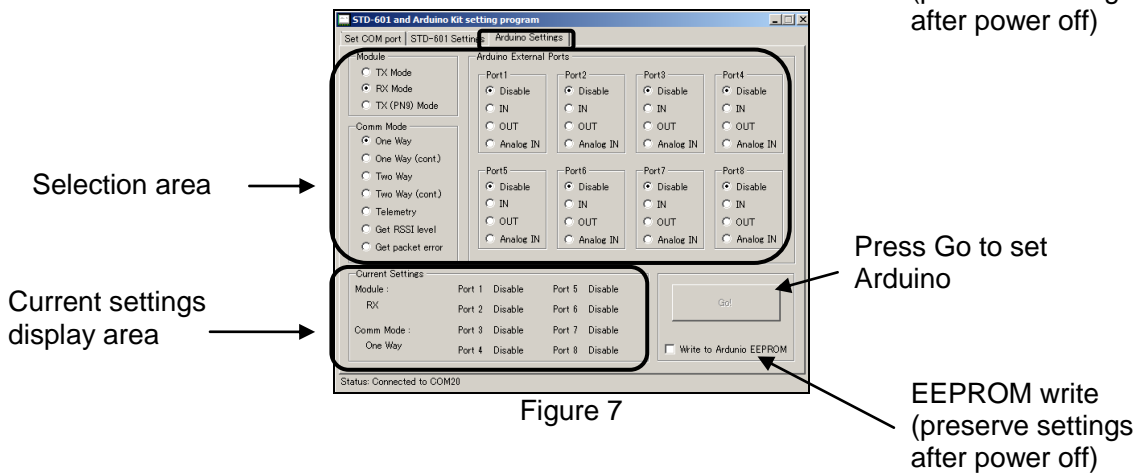
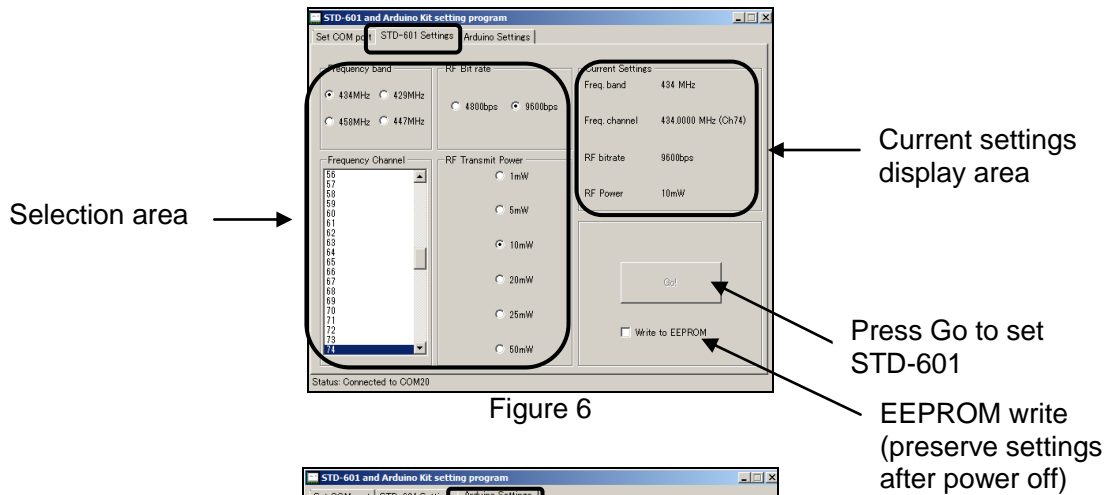
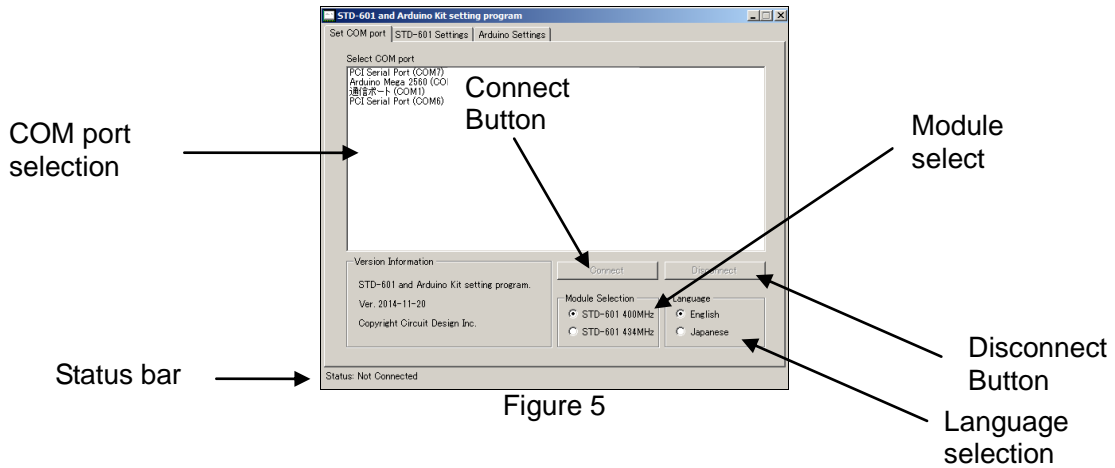


Figure 4

7. INTRODUCTION TO THE SETTING SOFTWARE

The setting software is a simple Windows graphical interface that allows setting of the STD-601 parameters and Arduino MEGA 2560. It is designed to be used with the Arduino MEGA 2560 sample code.

You must connect the evaluation board to your PC's USB port first and then open the evaluation software to get the screen as shown below.



7.1 – Connecting to the testboard

You must connect the TB-STD601 board to the PC first by using a USB cable and then open the setting software. The software will display the connection screen as shown in figure 5 under “Set COM Port”.

The available COM ports will display. Highlight the port that corresponds to the Arduino MEGA 2560 and press [Connect]. The status bar will then indicate a successful connection.

7.2 – Module selection

Before operating the module, the selection of STD-601 400MHz or STD-601 434MHz needs to be made as shown in figure 5. The default selection is STD-601 400MHz.

7.3 – Acquiring the current parameters of STD-601 and Arduino

Upon connection to the board, the software will automatically collect the current setting of both the STD-601 and the Arduino. The selection area in figure 6 and 7 will be enabled and display check marks showing the current parameters. The same information will also be displayed in the “Current settings display area” shown in figure 8.

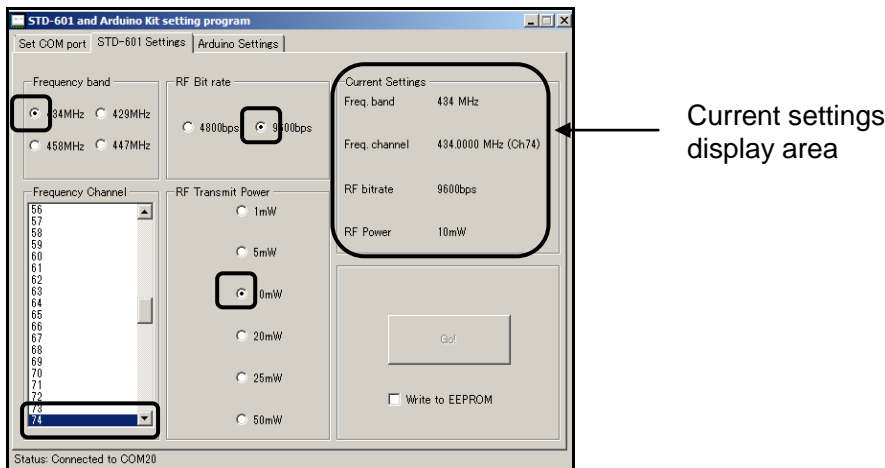


Figure 8

The selection area and parameters is explained in Table 1

STD-601 Settings tab	
<i>Frequency Band</i>	The frequency band setting in MHz
<i>Frequency Channel</i>	The frequency channel setting for the selected band
<i>RF Bit rate</i>	The RF bit rate
<i>RF transmit Power</i>	RF transmit power setting
Arduino settings tab	
<i>Module</i>	Set the board in TX or RX mode. TX(PN9) Mode is for transmission of PN9 signal and should not be used.
<i>Arduino External Ports</i>	The Arduino ports (1-8) / A0-A7 and their settings
<i>Comm Mode</i>	Sets the communication mode of the board

Table 1

7.4 Write to EEPROM

Check this box to enable EEPROM for the STD-601 or Arduino as shown in figure 6 and 7. This will save any new settings to the EEPROM so that when power is re-applied, the board will start on these settings.

7.5 Setting STD-601 and Arduino

Press [Go!] button shown in Figure 6 and 7 to set the STD-601 or Arduino after choosing the new settings. There are separate buttons for each of the STD-601 and Arduino tabs. Only when a new selection is made by the user will the [Go!] button be enabled. If no changes are made, the button will be disabled.

When the [Go!] button is pushed the program will go through the setting cycle. A final message at the end of the setting cycle will show. See Figure 9.

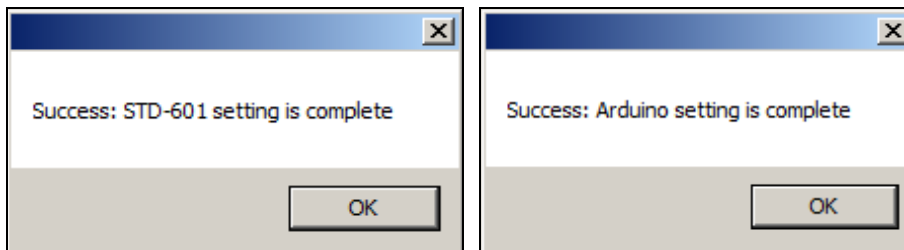


Figure 9

7.6 Disconnecting the board

Press [disconnect] to disconnect the board from the PC. After unplugging from the PC, the board will continue to operate from the settings stored in the STD-601 and Arduino's EEPROM memory.

7.7 Connecting two boards

It is possible to connect more than one board via separate ports and have multiple setting software running simultaneously. The software will display all ports that are currently connected to an Arduino 2560. To avoid selecting a port already in use, the setting software will display a warning if a connection to a used port is attempted.

8. STD-601 MODULE SETTING

8.1 Band selection

Use the Frequency Band selection area in figure 6 to select the frequency band. The available bands will vary according to whether STD-601 400MHz or STD-601 434MHz is selected shown in table 2.

Frequency Band	STD-601 400MHz	STD-601 434MHz*
434 MHz	•	•
429 MHz	•	
458 MHz	•	
447 MHz	•	

Table 2

*If STD-601 434MHz is selected, the band selection will be fixed to 434 MHz and not changeable in the band selection area.

After setting the new band and executing the setting cycle, a message shown in figure 9 will display.

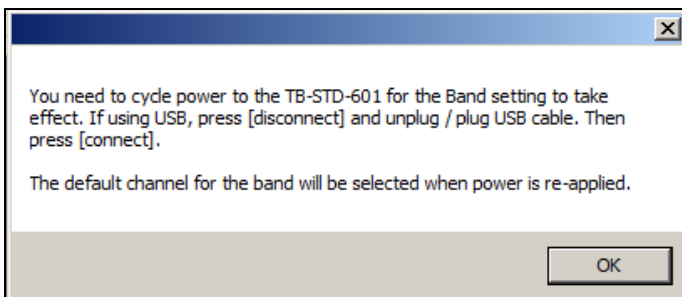


Figure 9

Note 1 : The module will not adjust to the new frequency band immediately after setting. For new band setting to take effect, please cycle power to the board shown in the confirmation message in Figure 9. If using USB power, push [disconnect] to close the port first. Then disconnect / reconnect USB cable.

Note 2: New frequency band setting will automatically write to EEPROM during the setting cycle of the STD-601. After cycling the power, this recently set band will be loaded from the EEPROM when power is re-applied.

Note 3: New frequency band setting will automatically be written to EEPROM during the setting cycle of the STD-601 and the default channel for that band will load when power is re-applied.

8.2 Frequency Channel selection

When choosing a band, the frequency channel selection list will adjust automatically to include the correct number of channels for that band. To select, highlight with the mouse. The corresponding bands, channels and their frequencies are shown in table 3 (Default values are highlighted).

● Channel Table 434MHz

Table 3

CH	HEX	Freq	CH	HEX	Freq	CH	HEX	Freq
0	00	433.0750	46	2E	433.6500	92	5C	434.2250
1	01	433.0875	47	2F	433.6625	93	5D	434.2375
2	02	433.1000	48	30	433.6750	94	5E	434.2500
3	03	433.1125	49	31	433.6875	95	5F	434.2625
4	04	433.1250	50	32	433.7000	96	60	434.2750
5	05	433.1375	51	33	433.7125	97	61	434.2875
6	06	433.1500	52	34	433.7250	98	62	434.3000
7	07	433.1625	53	35	433.7375	99	63	434.3125
8	08	433.1750	54	36	433.7500	100	64	434.3250
9	09	433.1875	55	37	433.7625	101	65	434.3375
10	0A	433.2000	56	38	433.7750	102	66	434.3500
11	0B	433.2125	57	39	433.7875	103	67	434.3625
12	0C	433.2250	58	3A	433.8000	104	68	434.3750
13	0D	433.2375	59	3B	433.8125	105	69	434.3875
14	0E	433.2500	60	3C	433.8250	106	6A	434.4000
15	0F	433.2625	61	3D	433.8375	107	6B	434.4125
16	10	433.2750	62	3E	433.8500	108	6C	434.4250
17	11	433.2875	63	3F	433.8625	109	6D	434.4375
18	12	433.3000	64	40	433.8750	110	6E	434.4500
19	13	433.3125	65	41	433.8875	111	6F	434.4625
20	14	433.3250	66	42	433.9000	112	70	434.4750
21	15	433.3375	67	43	433.9125	113	71	434.4875
22	16	433.3500	68	44	433.9250	114	72	434.5000
23	17	433.3625	69	45	433.9375	115	73	434.5125
24	18	433.3750	70	46	433.9500	116	74	434.5250
25	19	433.3875	71	47	433.9625	117	75	434.5375
26	1A	433.4000	72	48	433.9750	118	76	434.5500
27	1B	433.4125	73	49	433.9875	119	77	434.5625
28	1C	433.4250	74	4A	434.0000	120	78	434.5750
29	1D	433.4375	75	4B	434.0125	121	79	434.5875
30	1E	433.4500	76	4C	434.0250	122	7A	434.6000
31	1F	433.4625	77	4D	434.0375	123	7B	434.6125
32	20	433.4750	78	4E	434.0500	124	7C	434.6250
33	21	433.4875	79	4F	434.0625	125	7D	434.6375
34	22	433.5000	80	50	434.0750	126	7E	434.6500
35	23	433.5125	81	51	434.0875	127	7F	434.6625
36	24	433.5250	82	52	434.1000	128	80	434.6750
37	25	433.5375	83	53	434.1125	129	81	434.6875
38	26	433.5500	84	54	434.1250	130	82	434.7000
39	27	433.5625	85	55	434.1375	131	83	434.7125
40	28	433.5750	86	56	434.1500	132	84	434.7250
41	29	433.5875	87	57	434.1625	133	85	434.7375
42	2A	433.6000	88	58	434.1750	134	86	434.7500
43	2B	433.6125	89	59	434.1875	135	87	434.7625
44	2C	433.6250	90	5A	434.2000	136	88	434.7750
45	2D	433.6375	91	5B	434.2125			

● Channel table 429MHz

CH	HEX	Freq	CH	HEX	Freq	CH	HEX	Freq
0	00	429.1625	16	10	429.3625	32	20	429.5625
1	01	429.1750	17	11	429.3750	33	21	429.5750
2	02	429.1815	18	12	429.3875	34	22	429.5875
3	03	429.2000	19	13	429.4000	35	23	429.6000
4	04	429.2125	20	14	429.4125	36	24	429.6125
5	05	429.2250	21	15	429.4250	37	25	429.6250
6	06	429.2375	22	16	429.4375	38	26	429.6375
7	07	429.2500	23	17	429.4500	39	27	429.6500
8	08	429.2625	24	18	429.4625	40	28	429.6625
9	09	429.2750	25	19	429.4750	41	29	429.6750
10	0A	429.2875	26	1A	429.4875	42	2A	429.6875
11	0B	429.3000	27	1B	429.5000	43	2B	429.7000
12	0C	429.3125	28	1C	429.5125	44	2C	429.7125
13	0D	429.3250	29	1D	429.5250	45	2D	429.7250
14	0E	429.3375	30	1E	429.5375	46	2E	429.7375
15	0F	429.3500	31	1F	429.5500			

● Channel Table 458MHz

CH	HEX	Freq	CH	HEX	Freq	CH	HEX	Freq
0	00	458.5000	20	14	458.7500	40	28	459.0000
1	01	458.5125	21	15	458.7625	41	29	459.0125
2	02	458.5250	22	16	458.7750	42	2A	459.0250
3	03	458.5375	23	17	458.7875	43	2B	459.0375
4	04	458.5500	24	18	458.8000	44	2C	459.0500
5	05	458.5625	25	19	458.8125	45	2D	459.0625
6	06	458.5750	26	1A	458.8250	46	2E	459.0750
7	07	458.5875	27	1B	458.8375	47	2F	459.0875
8	08	458.6000	28	1C	458.8500	48	30	459.1000
9	09	458.6125	29	1D	458.8625	49	31	459.1125
10	0A	458.6250	30	1E	458.8750	50	32	459.1250
11	0B	458.6375	31	1F	458.8875	51	33	459.1375
12	0C	458.6500	32	20	458.9000	52	34	459.1500
13	0D	458.6625	33	21	458.9125	53	35	459.1625
14	0E	458.6750	34	22	458.9250	54	36	459.1750
15	0F	458.6875	35	23	458.9375			
16	10	458.7000	36	24	458.9500			
17	11	458.7125	37	25	458.9625			
18	12	458.7250	38	26	458.9750			
19	13	458.7375	39	27	458.9875			

● Channel Table 447MHz

CH	HEX	Freq	CH	HEX	Freq	CH	HEX	Freq
0	00	447.2625	20	14	447.5125	40	28	447.7625
1	01	447.2750	21	15	447.5250	41	29	447.7750
2	02	447.2875	22	16	447.5375	42	2A	447.7875
3	03	447.3000	23	17	447.5500	43	2B	447.8000
4	04	447.3125	24	18	447.5625	44	2C	447.8125
5	05	447.3250	25	19	447.5750	45	2D	447.8250
6	06	447.3375	26	1A	447.5875	46	2E	447.8375
7	07	447.3500	27	1B	447.6000	47	2F	447.8500
8	08	447.3625	28	1C	447.6125	48	30	447.8625
9	09	447.3750	29	1D	447.6250	49	31	447.8750
10	0A	447.3875	30	1E	447.6375	50	32	447.8875
11	0B	447.4000	31	1F	447.6500	51	33	447.9000
12	0C	447.4125	32	20	447.6625	52	34	447.9125
13	0D	447.4250	33	21	447.6750	53	35	447.9250
14	0E	447.4375	34	22	447.6875	54	36	447.9375
15	0F	447.4500	35	23	447.7000	55	37	447.9500
16	10	447.4625	36	24	447.7125	56	38	447.9625
17	11	447.4750	37	25	447.7250	57	39	447.9750
18	12	447.4875	38	26	447.7375	58	3A	447.9875
19	13	447.5000	39	27	447.7500			

8.3 RF bit rate

Adjust the RF bit rate between 4800bps and 9600bps by clicking the radiobuttons shown in figure 6.

8.4 RF transmit Power

Adjust the RF transmit power of the STD-601 (1, 5, 10 ,20, 25 ,50 mW) by clicking the radiobuttons shown in figure 6.

9. ARDUINO SETTING

9.1 Module

The boards need to be assigned as TX or RX. Use the setting software to set the board as TX or as RX. If selecting TX PN9 mode, activate the switch on the board to PN9. (TX (PN9) mode is only for the purpose of certification process and is not to be used during normal operation).

9.2 Communication Modes

After setting one board as TX and the other as RX, set the communication mode on each board. When selecting “Get RSSI level”, only the receiver needs to be set.

Communication mode (Board 1)	Page
One way	15
One way (continuous)	15
Two way	15
Two way (continuous)	16
Telemetry	17
Get RSSI Level	18
Get packet error	18

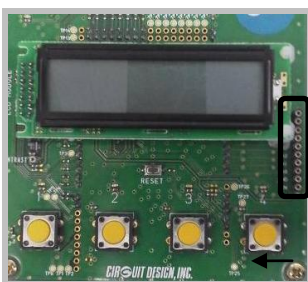
Table 5

9.3 Arduino External Port setting

The user can adjust the Arduino Ports as follows and connect any external circuitry to them e.g. switches LEDs. The ports are labeled A0 – A7 with nearby optional GND and Vout. Note that ports are paired between the boards i.e. Port 1 on TX board used as input(IN) means that the port 1 on RX board needs to be set as output (OUT). See table 6 for the port settings between both boards.

TX board (A0-A7)	RX board (A0-A7)
Disable	Disable
IN	OUT
OUT	IN
Analog IN	Analog IN

Table 6



Arduino Ports 1-8

Figure 10

10. LCD SCREEN

10.1 Displaying current settings

The LCD screen is able to display the current settings for the STD-601 and the Arduino as well as the communication (Comm) mode. See table 7 for details.

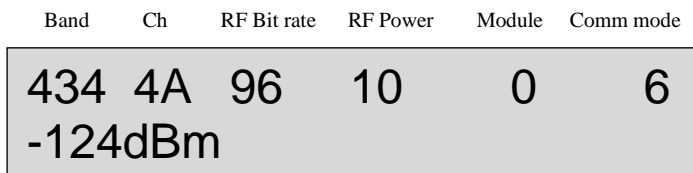


Figure 11

Parameter	Details
Band	Frequency band setting
Ch	Frequency channel setting. Displayed in HEX
RF bit rate	RF Bit rate setting. 48 – 4800bps 96 – 9600bps
RF power	RF transmit power setting in mW
Module	Module setting. TX mode – 0 RX mode – 1 TX(PN9) - 2
Comm mode	Communication mode setting One Way - 0 One Way (cont) - 1 Two Way - 2 Two Way (cont) - 3 Telemetry - 4 Get RSSI level - 5 Get packet error - 6

Table 7

10.2 Analogue input

When analog data is input whilst in telemetry mode, the LCD will display a value from 0 – 99 (100 step) corresponding to the voltage value at the port input. Values of 0 – 5V are represented as 0 - 99.

The RSSI level of the current channel is displayed on the second line on Figure 12.

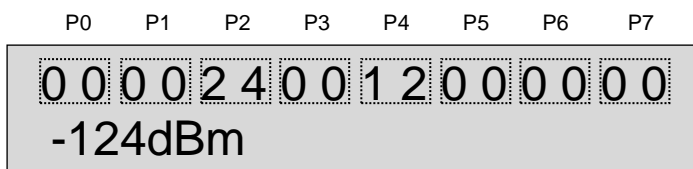


Figure 12

10.3 Displaying Packet count

During the Packet Test, 1000 packets are transmitted. The transmit count will appear on the TX LCD and receive count will appear on the RX LCD. The difference in the two values indicates packets lost.

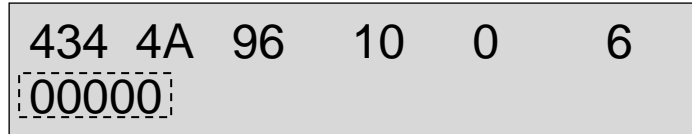


Figure 13

The value on the LCD will show 00000 to 01000.

10.4 Displaying RSSI levels

Displayed RSSI levels at the following settings:

Module setting	Communication mode	Meaning
TX Mode	Two Way	RSSI level of RF level during reception of ACK from the receiver board.
	Two Way (cont)	
	Telemetry	
RX Mode	One Way	RSSI level of RF level at receiver board during reception of signals from transmitter board.
	One Way (cont)	
	Two Way	
	Two Way	
	Telemetry	
	Get packet error	
	Get RSSI level	RSSI level of surrounding RF level on the current channel not limited to signals from the transmitter.

11. EXPLANATION OF EACH MODE

11.1 One-way

This mode allows you to push the switches on the TX board and transmit this data to the RX board. Using 2 boards, set the STD-601 module and the Arduino MEGA 2560 as follows:

Setting	Board TX setting	Board RX setting
Module	TX mode	RX mode
Communication mode	One way	One way

- Press any switch (1-4) on TX board and the corresponding LED will light for 100ms on the RX board.
- Holding down any switch (1-4) will cause the corresponding LED to blink repeatedly.
- The TX LED on the TX board will flash when it transmits data.
- Transmission from the TX board occurs only when a button is pressed.
- The RX LED on the RX board will flash when it receives data.

11.2 One-way continuous

This mode allows you to push the switches on the TX board and transmit this data continuously to the RX board. Using 2 boards, set the STD-601 module and the Arduino MEGA 2560 as follows:

Setting	Board TX setting	Board RX setting
Module	TX mode	RX mode
Communication mode	One way cont	One way cont

- Press any switch (1-4) on TX board and the corresponding LED will light on the RX board.
- The TX LED on the TX board is ON when it transmits data.
- Transmission from the TX board occurs continuously whether or not a button is pressed.
- The RX LED on the RX board will flash when it receives data.

11.3 Two way

This mode allows you to push the switches on the TX board and transmit this data to the RX board and vice versa. When RX board receives the signal, it sends an ACK signal back to the TX board. Using 2 boards, set the STD-601 module and the Arduino MEGA 2560 as follows:

Setting	Board TX setting	Board RX setting
Module	TX mode	RX mode
Communication mode	Two way	Two way

- Press any switch (1-4) on TX board and the corresponding LED will light for 100ms on the RX board.
- Holding down any switch (1-4) will cause the corresponding LED to blink repeatedly. During this time, if a switch is pressed on the RX board, the corresponding LED on the TX board will blink.
- The TX LED on the TX board will flash when it transmits data. If the TX board is receiving a signal, its RX LED will flash.
- Transmission from the TX board occurs only when a button is pressed.
- The RX LED on the RX board will flash when it receives data. When it transmits back, its TX LED will flash.
- The ACK LED on the TX board will flash in 100ms intervals, when it receives data from the RX board.

11.4 Two way continuous

This mode allows you to push the switches on the TX board and transmit this data to the RX board and vice versa. When RX board receives the signal, it sends an ACK signal back to the TX board. Using 2 boards, set the STD-601 module and the Arduino MEGA 2560 as follows:

Setting	Board TX setting	Board RX setting
Module	TX mode	RX mode
Communication mode	Two way cont.	Two way cont.

- Press any switch (1-4) on TX board and the corresponding LED will light on the RX board.
- Holding down any switch (1-4) will cause the corresponding LED to illuminate continuously. If a switch is pressed on the RX board, the corresponding LED on the TX board will also come on.
- The TX LED on the TX board will flash when it transmits data. When the TX board is receiving a signal, its RX LED will flash.
- Transmission/reception from the TX/RX boards occurs continuously whether or not buttons are pressed.
- The RX LED on the RX board will flash when it receives data. When it transmits back, its TX LED will flash.
- The ACK LED on the TX board will flash in 100ms intervals, when it receives data from the RX board.

11.5 Telemetry

This mode is similar to two-way and communication is continuous between the TX and RX boards. It allows transmission of analogue data e.g. from a sensor or potentiometer. The boards do not have onboard potentiometers, so an analogue signal is fed to any of the ports A0-A7. Connect an analogue source to any one of A0-A7. Vin / GND ports are available to use to construct the analogue signal.

Operating the switches in this mode will not turn on the LEDs.

Connection example:

Setting	TX board	RX board
Module	TX Mode	RX Mode
Comm Mode	Telemetry	Telemetry
Arduino External Ports	With same port used on RX board, set to Analog IN	Set the port to Analog IN

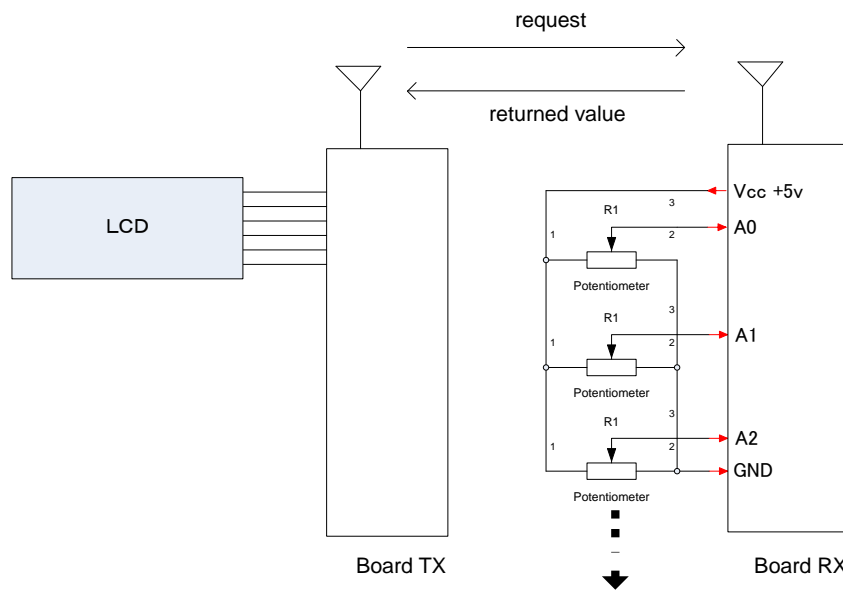


Figure 14

- The TX LED blinks on the TX board during transmission. The RX LED will blink during reception of this signal.
- When the TX board receives the ACK signal from the RX board, the ACK LED will blink at 100ms intervals.

Figure 14 shows connection example with volume controls connected to the Arduino ports. Optional GND and Vcc terminals are placed next to the Arduino ports.

The LCD (Figure 15) displays the ports and their input values. Values 0-99 are used to represent 0-5V.

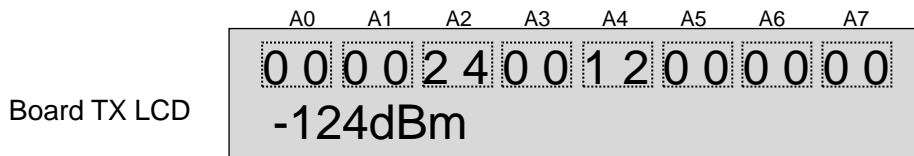


Figure 15

11.6 Get RSSI level

This mode is able to monitor RSSI level (received signal strength indication) of the STD-601's currently set channel. In the Arduino settings tab, set "Module" to RX mode (TX setting will not allow this mode to work) and the communication mode to Get RSSI level.

Setting	Setting value
Module	RX Mode
Comm Mode	Get RSSI level

The RSSI level is displayed on the LCD in dBm.

11.7 Get Packet Error

This mode, similar to one-way, sends 1000 packets from the TX board to RX board. The number of successfully received packets is displayed on the LCD of the RX board shown in Figure 16.

Setting	TX board	RX board
Module	TX Mode	RX Mode
Comm Mode	Get packet error	Get packet error

- On the TX board LCD shows the packets transmitted. On the RX board LCD shows the packets successfully received.
- On the TX board, the TX LED blinks during transmission. The RX board's RX LED blinks during reception.

Control of the packet transmission is shown in Figure 16.

1. TX board

- To start the packet transmission, press switch 1 on the TX board. Switch 2 stops the transmission. If the user does not stop the transmission, it will automatically stop at 1000 packets.
- During transmission of the packets, LED 1 will blink.

2. RX board

- Switch 1 on the RX board will reset the packet count to 0.
- LCD on the RX board will continue to display RSSI in dBm.

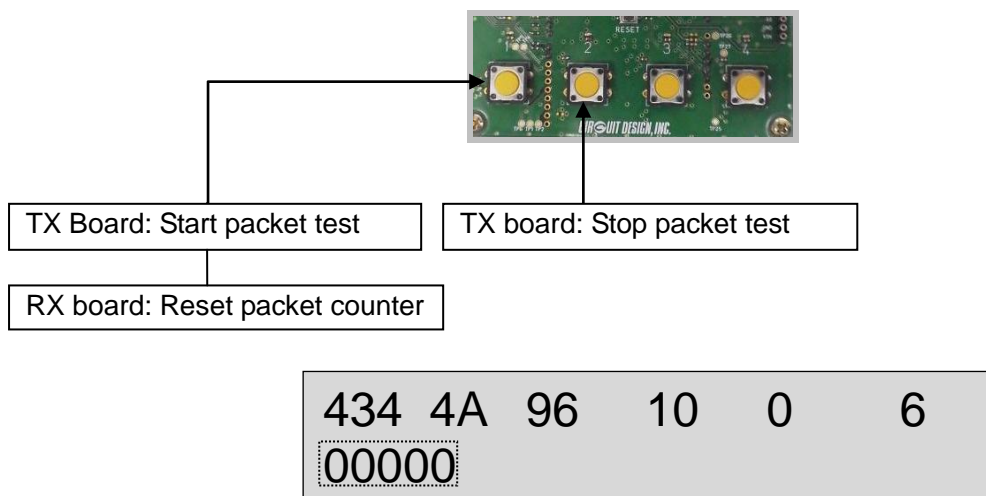


Figure 16

12. EXTERNAL PORTS

The ports 1-8 correspond to A0-A7 on the board. The ports allow connection to external circuitry with examples shown in Figure 17.

In the Arduino settings tab, ports are listed with each port selectable as “Input”, “Output” or “ AnalogIN”. If a port is unused, choose “Disable”. When choosing input, all ports contain inbuilt pull-up resistors, so no external pull-up resistor is required.

For more detail, refer to 9.3 Arduino External Port setting.

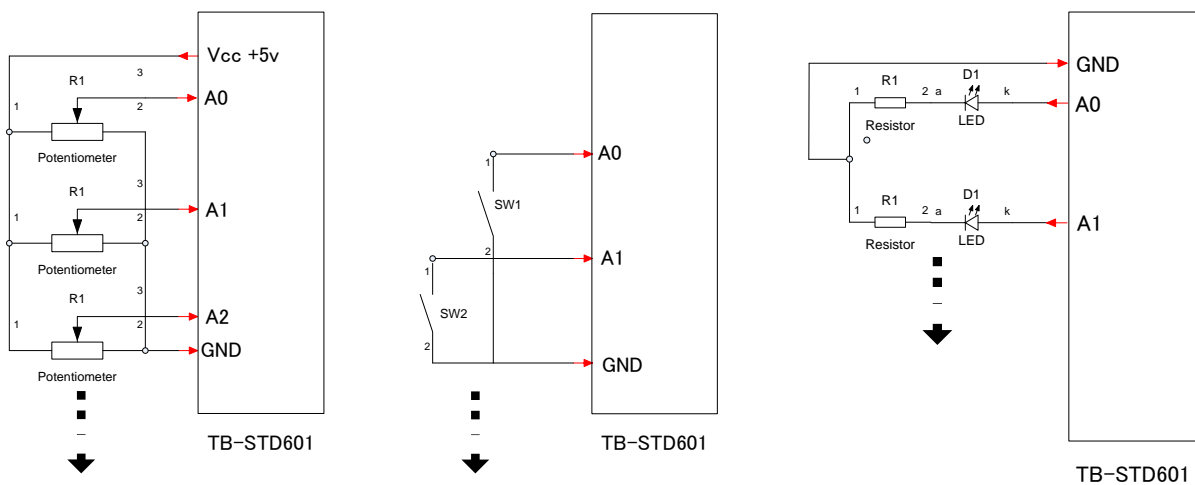


Figure 17

13. MESSAGES

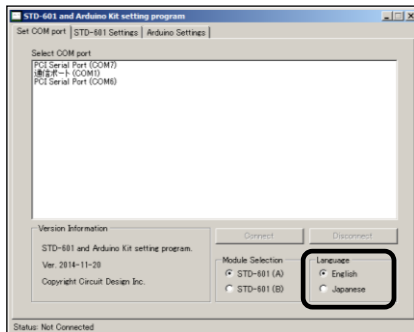


Figure 18

Messages can be displayed in Japanese or English by making the selection shown in Figure 18. Note that language selection cannot be changed once connected.

STD-601	
You need to cycle power to the TB-STD601 for the Band setting to take effect. If using USB, press [disconnect] and unplug / plug USB cable. Then press [connect]. The default channel for the band will be selected when power is re-applied.	Occurs when changing to a new band. The request is received by both the Arduino and the STD-601, but the STD-601 cannot change over to the new band until power is cycled. Make sure to disconnect the board from the PC first by pushing the disconnect button.
STD-601 setting failed	If the STD-601 parameter could not be set, the setting cycle aborts.
Success: STD-601 setting is complete	When all STD-601 parameters are successfully set

Arduino	
Please move the switch to PN9 on the board.	Displayed when selecting TX (PN9)
Please move the switch to NORMAL on the board.	Displayed when selecting TX or RX from TX (PN9)
Arduino setting failed	If the Arduino parameter could not be set, the setting cycle aborts.
Success: Arduino setting is complete	When all Arduino parameters are successfully set

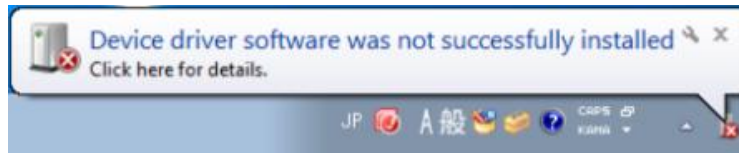
General	
Port cannot be opened (already used by other application)	The port is already used. Select another port
Failed to Connect	The port cannot be used
Connection to TB-STD601 successful	After opening the port and acquiring all parameters from both Arduino and STD-601.
COM Port closed. Unplug USB cable from the board.	After disconnection of PC from the board
Could not get or set the parameter for STD-601	No response when setting the parameter for the STD-601
Could not get or set the parameter for Arduino	No response when setting the parameter for the STD-601

LCD screen	
STD601 ERROR.	Connection to STD-601 error.

14. INSTALLING ARDUINO USB DRIVER

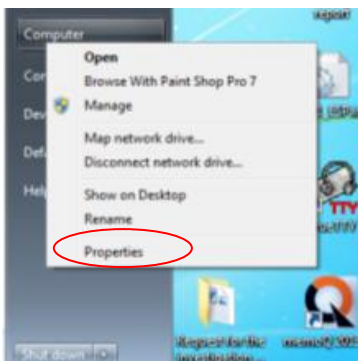
To use the Arduino with your PC, you need to install the USB driver specifically for use with Arduino products. If the Arduino is connected to the PC that does not have the USB driver installed, a message similar to the one below will be displayed.

In this case, please install the Arduino USB driver using the procedure below.
(This procedure below is for Windows 7 users)



1. Download the Arduino USB driver from the following URL:
- <http://www.cdt21.com/products/transceiver/std601b/06.asp>

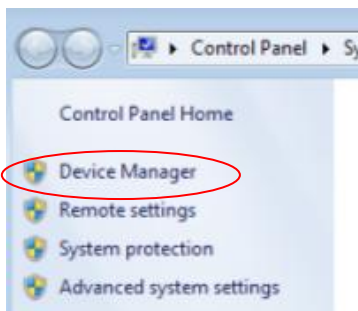
The Arduino USB driver files are zipped so please extract to an appropriate folder. As an example, the following procedure is for extraction to the PC desktop. When extracting to the desktop, the following folder will appear as shown.



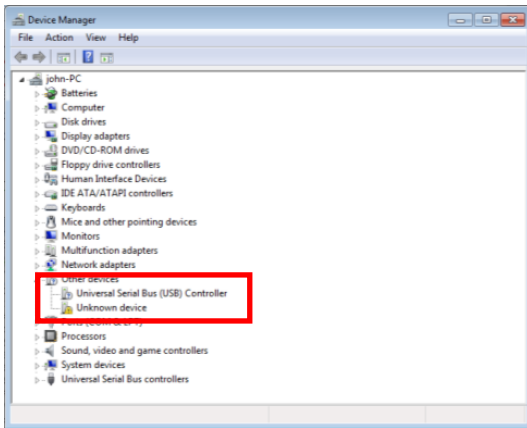
2. Opening Device Manager.

To install Arduino USB driver, open Device Manager. To open Device Manager, follow the procedure here (described procedure is one example, there are other methods)

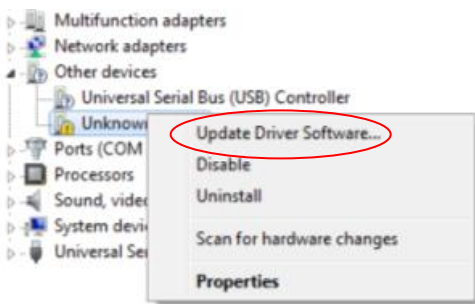
- In the Start menu, right-click on “Computer” and in the drop down menu select “Properties”



- In the dialog window, on the left hand side (Control Panel Home), select “Device Manager”.

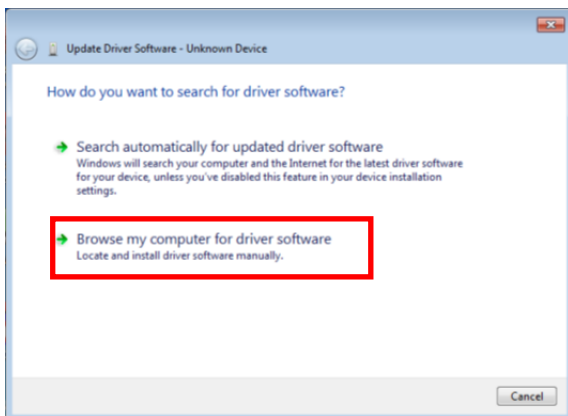


- After opening the Device Manager, scroll down the list to “Other Devices” and “Unknown device” will be displayed here.

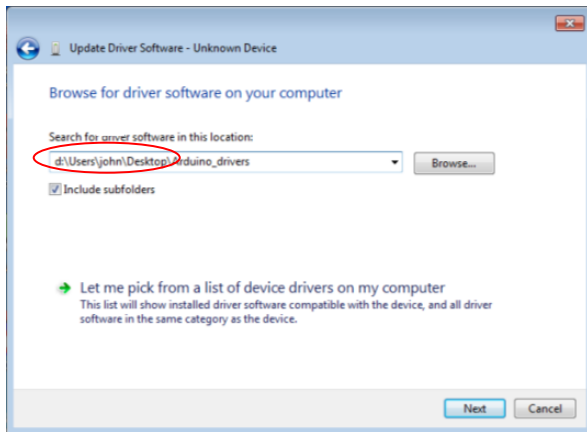


3. Installing the Arduino USB driver
*When you install the USB driver, it will become necessary to have administrator access for that PC. In this case, please install the driver with administrator access.

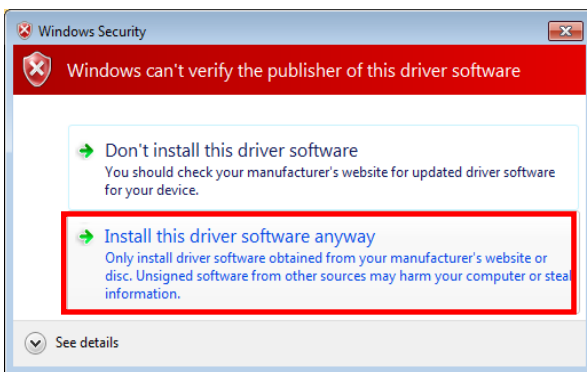
- By right clicking on “Unknown device” in the Device Manager window, a drop down list will appear. Then select “Update Driver Software”.



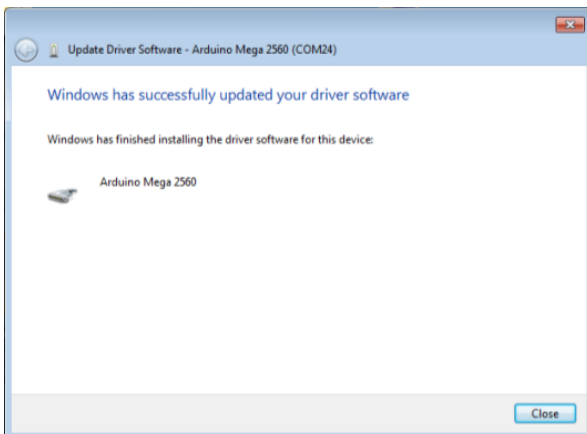
- When the “Update Driver Software” dialog box is open, select “Browse my computer for driver software”. By selecting this, you are going to manually search for the driver software in your PC.



- After making this selection, navigate to the folder where you unzipped the Arduino USB driver. (in this example, the folder on the desktop). Check the option where it says “Include subfolders” and click the “Next button”.



- The Windows security dialog box will display. The second option will show “Install this driver software anyway”. Select this option.



- Installation of the Arduino USB driver will begin. When installation is complete, the following dialog box will display below.

Cautions

- As the product communicates using electronic radio waves, there are cases where transmission will be temporarily cut off due to the surrounding environment and method of usage. The manufacturer is exempt from all responsibility relating to resulting harm to personnel or equipment and other secondary damage.
- Do not use the equipment within the vicinity of devices that may malfunction as a result of electronic radio waves from the product.
- The manufacturer is exempt from all responsibility relating to secondary damage resulting from the operation, performance and reliability of equipment connected to the product.
- Communication performance will be affected by the surrounding environment, so communication tests should be carried out before actual use.
- Ensure that the power supply for the product is within the specified rating. Short circuits and reverse connections may result in overheating and damage and must be avoided at all costs.
- Ensure that the power supply has been switched off before attempting any wiring work.
- The case is connected to the GND terminal of the internal circuit, so do not make contact between the '+' side of the power supply terminal and the case.
- When batteries are used as the power source, avoid short circuits, recharging, dismantling, and pressure. Failure to observe this caution may result in the outbreak of fire, overheating and damage to the equipment. Remove the batteries when the equipment is not to be used for a long period of time. Failure to observe this caution may result in battery leaks and damage to the equipment.
- Do not use this product in vehicles with the windows closed, in locations where it is subject to direct sunlight, or in locations with extremely high humidity.
- The product is neither waterproof nor splash proof. Ensure that it is not splashed with soot or water. Do not use the equipment if water or other foreign matter has entered the case.
- Do not drop the product or otherwise subject it to strong shocks.
- Do not subject the equipment to condensation (including moving it from cold locations to locations with a significant increase in temperature.)
- Do not use the equipment in locations where it is likely to be affected by acid, alkalis, organic agents or corrosive gas.
- The GND for the product will also affect communication performance. If possible, ensure that the case GND and the circuit GND are connected to a large GND pattern.

Warnings

- Do not take apart or modify the equipment.
- Do not remove the product label (the label attached to the upper surface of the product.) Using a product from which the label has been removed is prohibited.

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REVISION HISTORY

Version	Date	Description	Remark
1.0	Oct 2015	The first issue	