Using the Programming Arduino

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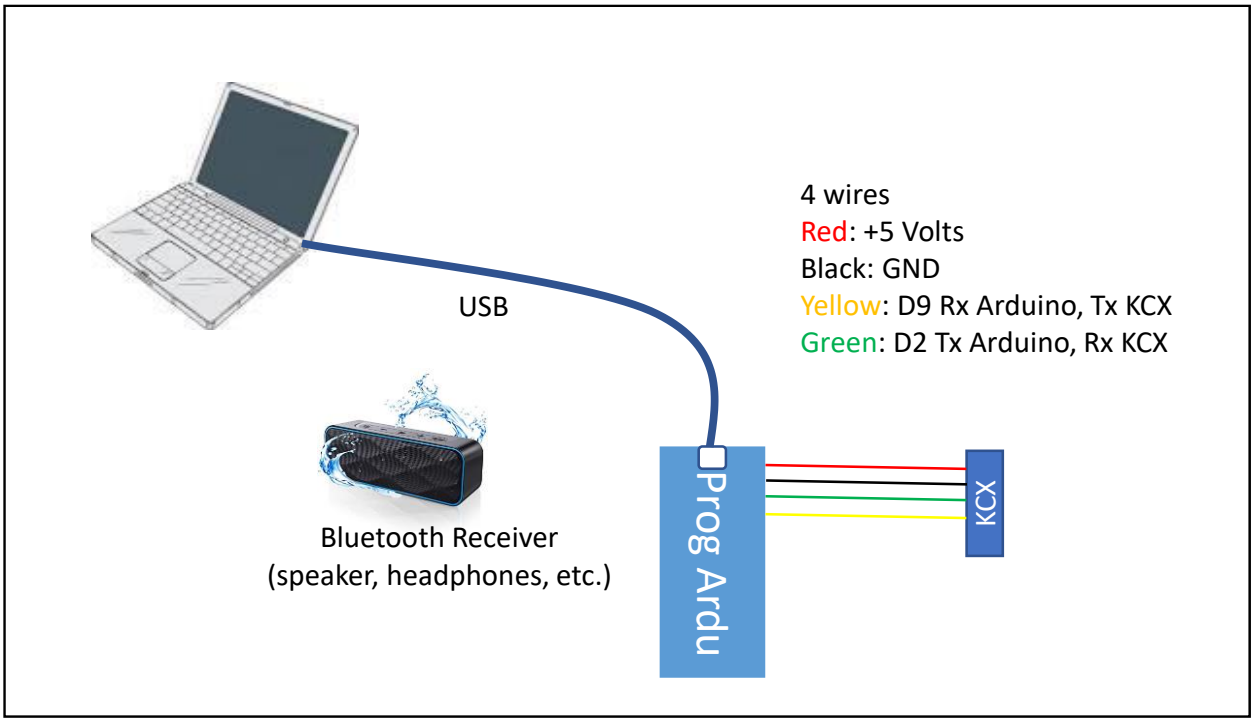
https://github.com/Mark-MDO47/BluetoothAudioTransmitter_KCX_BT_EMITTER

https://github.com/Mark-MDO47/BluetoothAudioTransmitter_KCX_BT_EMITTER/blob/master/ProgrammingArduino/ProgrammingArduino.ino

We use the Programming Arduino to program the VMLINK table in the KCX_BT_EMITTER Bluetooth Audio Transmitter Module. VMLINK is the table that stores the info on Bluetooth receiver(s) (speaker, headphone, etc.) that the KCX_BT_EMITTER would automatically connect to. This KCX_BT_EMITTER VMLINK table can store info about more than one Bluetooth receiver. If info about more than one Bluetooth receiver is stored in VMLINK, the KCX_BT_EMITTER would try to connect to the first entry that was a device that it could see on its scan of Bluetooth devices.

Connections



The Programming Arduino should be a type of Arduino that uses 5 Volt interfaces. For example, an Arduino Uno or an Arduino Nano Classic.

Programming

- Power off programming Arduino by disconnecting from USB
- Connect wires as follows

Arduino Pin	KCX_BT_EMITTER pin	suggested wire color
5V	+5V	Red
GND	PGND	Black
D2 (TX)	RX	Green
D9 (RX)	TX	Yellow

- Connect programming Arduino to USB for PC running the Arduino software
- On the PC running the Arduino software
  - Upload the sketch from ProgrammingArduino.ino into the programming Arduino
  - Open Serial Monitor by selecting menu "Tools" -> "Serial Monitor"
  - Follow instructions on the serial monitor
  - After each selected step, wait for the string "--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE ---"
- Disconnect programming Arduino from USB for PC running the Arduino software

Sample Session

For this sample session, we start with the “Old and Broken” device in the VMLINK table. We want to remove that and put in our “S1 Pro” device. Because both Jim and Mark have S1 Pro Bluetooth speakers, I will label this one “S1 Pro MDO” (you do not need to use the default name provided by the manufacturer).

In order to add S1 Pro MDO we need to know what its unique address is. This can be found by turning the speaker on and telling the KCX_BT_EMITTER to scan for Bluetooth speakers and headphones that it can connect to.

The table below shows the Serial Monitor output from a session of programming the KCX_BT_EMITTER Bluetooth Audio Transmitter module. The colors for the serial monitor output column are:

- BLACK - communication from the Programming Arduino, either asking for directions or giving feedback. It often asks which “programming step” to execute: SCAN, DISPLAY, ADD, or DELETE ALL.
- RED - “AT” commands sent to the KCX_BT_EMMITER. It takes several “AT” commands to perform a user-selected “programming step”.
- GREEN - KCX_BT_EMMITER direct status response to the “AT” command.
- BLUE - communication from the KCX_BT_EMMITER reporting what it sees on its scan.

Programming Arduino Serial Monitor output	Comments
Bluetooth Programming Arduino init... completed! 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	Startup Request user to command action User types in number
5=STATUS	feedback to user on selection
SCAN.... **SCAN....**	Scan output from KCX_BT_EMITTER
------------ RESULT --------------- --> CMD 0: AT+	RESULT flag to show start/end "Aliveness" command
OK+	command response
--> CMD 1: AT+GMR?	"query version" cmd to KCX_BT_EMITTER
OK+VERS:KCX_BT_RTX_V1.4	command response
--> CMD 2: AT+BAUD?	"query baud" cmd to KCX_BT_EMITTER
OK+BAUD=0,BAUD=9600	command response
SCAN....	Scan output from KCX_BT_EMITTER
--> CMD 3: AT+BT_MODE?	"query mode" cmd to KCX_BT_EMITTER
OK+BT_EMITTER	command response
--> CMD 4: AT+CHANNEL?	"query chan" cmd to KCX_BT_EMITTER
OK+CHANNEL=BT_CHANNEL	command response
--> CMD 5: AT+VOL?	"query vol" cmd to KCX_BT_EMITTER
OK+VOL=31	command response
--> CMD 6: AT+STATUS?	"query statu" cmd to KCX_BT_EMITTER
OK+STATUS:0	command response
------------ RESULT END -----------	RESULT flag to show start/end
SCAN....	Scan output from KCX_BT_EMITTER

Programming Arduino Serial Monitor output	Comments
--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE --- 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	End of prev commanded steps Request user to command action User types in number
1=SCAN	feedback to user on selection
SCAN....	Scan output from KCX_BT_EMITTER
------------ RESULT --------------- --> CMD 0: AT+	"Aliveness" command
OK+	command response
--> CMD 1: AT+RESET	RESET cmd to KCX_BT_EMITTER
OK+RESET	command response
ʕe **11**	Glitches on serial line
POWER ON	command response
SCAN....	Scan output
--> CMD 2: AT+	Aliveness cmd to KCX_BT_EMITTER No longer any SCAN command
OK+	command response
--> CMD 3: AT+	Aliveness cmd to KCX_BT_EMITTER No longer any SCAN command
OK+	command response
MacAdd:9dd3ecfd4ef4,Name:S1 Pro	Scan output
--> CMD 4: AT+	Aliveness cmd to KCX_BT_EMITTER No longer any SCAN command
OK+	command response
------------ RESULT END -----------	RESULT flag to show start/end

Programming Arduino Serial Monitor output	Comments
--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE --- 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	End of prev commanded steps Request user to command action User types in number
2=DISPLAY	feedback to user on selection
------------ RESULT --------------- --> CMD 0: AT+	
OK+	
--> CMD 1: AT+VMLINK?	Query VMLINK cmd
OK+VMLINK BT_ADD_NUM=01 BT_NAME_NUM=01 Auto_link_Add:null MEM_MacAdd 00:000000000012 **MEM_Name 00:Old and Broken**	Old and Broken device is in the VMLINK table, but we want to remove that and put in our S1 Pro device
------------ RESULT END -----------	
--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE --- 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	
4=DELETE ALL	
------------ RESULT --------------- --> CMD 0: AT+	
OK+	
--> CMD 1: AT+DISCON	RESET command
OK+DISCON	
SCAN....	

Programming Arduino Serial Monitor output	Comments
--> CMD 2: AT+DELVMLINK	Delete everything in VMLINK
Delete Vmlink	
MacAdd:9dd3ecfd4ef4,Name:S1 Pro CON ONE CONNECT=>MacAdd:9dd3ecfd4ef4,Name:S1 Pro	
--> CMD 3: AT+RESET	RESET so we read and use the new VMLINK table (all empty now)
OK+RESET	
SCAN....	
e **11**	Glitches on serial line
POWER ON	
SCAN.... MacAdd:9dd3ecfd4ef4,Name:S1 Pro CON LAST	
--> CMD 4: AT+	
OK+	
--> CMD 5: AT+VMLINK?	Display VMLINK again
OK+VMLINK BT_ADD_NUM=00 BT_NAME_NUM=00 Auto_link_Add:9dd3ecfd4ef4	all empty
---------- RESULT END ----------	RESULT flag to show start/end
--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE --- 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	
3=ADD	Now we add the S1 Pro MDO to VMLINK
Enter the unique MAC address for the Bluetooth speaker or headphones; it starts with 0x upper or lower case does not matter; maximum of 12 characters after the 0x To abort adding an auto-connect Bluetooth receiver device to storage, just enter an empty line ==>	
Your entry "0x9dd3ecfd4ef4" was accepted	Get the address from the SCAN

Programming Arduino Serial Monitor output	Comments
Enter the name you choose for this device; it is OK to place spaces between words maximum of 20 characters total To abort adding an auto-connect Bluetooth receiver device to storage, just enter an empty line ==>	
Your entry "S1 Pro MDO" was accepted	Just about any name you want
------------- RESULT --------------- --> CMD 0: AT+	RESULT flag to show start/end "Aliveness" command Now we do a command sequence to add that BT device to VMLINK
OK+	
--> CMD 1: AT+DISCON	
OK+DISCON	
SCAN.... MacAdd:9dd3ecfd4ef4,Name:S1 Pro CON LAST	
--> CMD 2: AT+VMLINK?	Display VMLINK
OK+VMLINK BT_ADD_NUM=00 BT_NAME_NUM=00 Auto_link_Add:9dd3ecfd4ef4	There is nothing in VMLINK before we do our ADD
--> CMD 3: AT+ADDLINKADD=9dd3ecfd4ef4	ADD the MAC Address
OK+ADDLINKADD=9dd3ecfd4ef4 BT_ADD_NUM=01 BT_NAME_NUM=00 Auto_link_Add:9dd3ecfd4ef4 **MEM_MacAdd 00:9dd3ecfd4ef4**	
--> CMD 4: AT+ADDLINKNAME=S1 Pro MDO	ADD our name - does not have to match the name the manufacturer gave it
OK+ADDLINKNAME=S1 Pro MDO BT_ADD_NUM=01 BT_NAME_NUM=01 Auto_link_Add:9dd3ecfd4ef4 MEM_MacAdd 00:9dd3ecfd4ef4 MEM_Name 00:S1 Pro MDO	
--> CMD 5: AT+RESET	We RESET to force it to read and use the modified VMLINK
OK+RESET	

Programming Arduino Serial Monitor output	Comments
SCAN....	
?d **11**	Glitches on serial line
POWER ON	command response
MacAdd:9dd3ecfd4ef4,Name:S1 Pro CON MATCH ADD **CONNECT=>MacAdd:9dd3ecfd4ef4,Name:S1 Pro**	Note that it matched the MAC address even though we had a different name. It still connected.
--> CMD 6: AT+	
OK+	
--> CMD 7: AT+VMLINK?	Make sure we put the right stuff in the VMLINK
BT_ADD_NUM=01 BT_NAME_NUM=01 Auto_link_Add:9dd3ecfd4ef4 MEM_MacAdd 00:9dd3ecfd4ef4 **MEM_Name 00:S1 Pro MDO**	OK that is from our ADD
---------- RESULT END ----------	
--- KCX_BT_EMITTER PROGRAMMING STEP COMPLETE --- 0 - Pair with Bluetooth receiver devices (such as speaker, headphones, etc.) 1 - Scan for Bluetooth receiver devices 2 - Display stored auto-connect Bluetooth receiver devices 3 - Add one auto-connect Bluetooth receiver device to storage 4 - Delete all auto-connect Bluetooth receiver devices from storage 5 - Current XMTR status 6 - BT Disconnect 7 - PowerOff module **==>**	