

HOW TO: Update Software for Rangemaster X2.PRO sequencer User Manual

Revision Date: 02.02.2023

PROFESSIONAL SHOOTING GROUND AUTOMATION



YOU NEED

- X2 PRO sequencer with the power supply
- Computer or Laptop
- The update files are sent to you by the Rangemaster Systems operator via email saved on your laptop (2 files in .hex and .eep formats)
- Microchip Technology ATATMEL-ICE programmer (you can order it e.g. from Digikey, Reichelt or Conrad electronic shops).



1. Download software Atmel Studio ver. 7.X from <u>www.atmel.com</u> website and install it before attaching programmer for the first time and start the program

2. Attach the programmer to the USB slot of PC or laptop

3. Open X2 PRO:

- unscrew the 4 front screws and remove the front cover



- unscrew 4 back side screws and remove the back side cover



- unscrew the screws holding front PCB





- remove the display front PCB by slightly pulling the left or right side panel



4. Now you have access to the microcontroller board. Attach the other side of the programming cable to the microcontroller board connector.



5. Power the X2 PRO on and keep the **ON** button on all the time (ask somebody to assist you).





6. Go to **Atmel Studio** program on your laptop and press Tools \rightarrow Device Programming.



7. Make the following settings:
Tool: Atmel-ICE XXXXX
Device: Atmega 2560
Interface: ISP and press Apply
Set ISP Clock to a value around 1000 kHz and press Set

AtmelStudio		Advanced Mode 🔻	Quick Launch (Ctrl+Q)	P - 0
File Edit View VAssistX ASF Project Debug Jools Window Help Image: Contract of the state o	Dature Davison of Land	? ×	ਗ਼ ੵ© ਫ਼ ☆ ∞ ੶	
Tool Device In Atmel-ICE × ATmega2560 •	Arget Device signature Target Voltage Image: Second state Inot read Read Image: Read Im			
The selected combination i	not applied.			
	Select tool, device and interface.			
		Close		



We have 2 stages of programming: Flash and EEPROM. Open **Memories** section:

💰 AtmelStudio		Advanced Mode 🔻	Quick Launch (Ctrl+Q)	۵ – ۵
Eile Edit View VAssistX ASF Project Debu ◎ - ○ ☆ - ⊕ ☆ - ♀ ♀ ♀ ↓ ☆ ♂ ↑	ig Jools Window Help		╗ᢞ╚ॾॗॎॵॐ ∞ -	
¥ M A ■ A ■ A ■ A ■ A ■ A ■ A ■ A ■ A ■ A	Atmel-ICE (#180002729) - Device Programming Tool Device Interface Interface Device Interface Interface settings Device Tool information Pask (256 K8) Device information Flask (256 K8) Oscillator celibration Verify Flash after programming Proses O Advanced EXPROVITION file EEPROM (4 K8) Verify EEPROM after programming Program Verify EEPROM after programming Orogram	? ×		
	etting clock valueOK esding clock valueOK etting interface settingsOK	Close		

8. To update Flash (Software):

- Open the firmware which we are going to upload by using ... button in the Flash (256KB) section: *in our case it is on C disk in X2 Firmware folder, file in hex format called V17.hex.*

- Click **Program** button and wait until it is finished

00042729) - D	evice Prog	ramming					?	×
Device ATmega256	0 -	Interface ISP ~ Apply	Device signature 0x1E9801	Read	Target Voltage 4,8 V Read	Ŷ		
igs on	Device Erase (Chip ~ Erase now]					
ation pration	Flash (2 C:\X2 F	56 KB) ïrmware\V17.hex					v	
	Veri	e device before progra fy Flash after program ranced	amming ming		Program Vi	erify	Read	
•	EEPRON C:\X2 F	1 (4 KB) irmware\V17eeprom.e	ep				v	
		✓ Verify EEPROM after programming ✓ Advanced					Read	
OK ashOK OK I								
	Device ATmega256 gs nn ttion ration CK sshOK	Device ATmega2560 ↓ gs Device gs Device frasho CA22 F Veri OK CA22 F Veri Adv CA22 F Veri Adv CA22 F Veri Adv CA22 F Adv CA22 F CA22	Device Interface Interface ISP ~ [Apply] gs perice ISP ~ [Apply] gs perice Erase Chip ~ Erase now tition CitX2 Firmware\V17.hex CitX2 Firmware\V17.hex EEPROM (4 KB) CitX2 Firmware\V17.eeprom.e Q Verify Flash after program (> Advanced EEPROM (4 KB) CitX2 Firmware\V17.eeprom.e Q Verify EEPROM after program (> Advanced DK sshOK	Device Interface Device signature ATmega2560 ISP Apply 0x1E9801 gs n Erase Chip Erase now Flash (256 K8) CAX2 Firmware\V17.hex Ø Verify Flash after programming Ø Verify Flash after programming Ø Verify EEPROM 4 K8) CAX2 Firmware\V17eeprom.eep Ø Verify EEPROM after programming Ø Verify EEPROM after programming Ø Verify EEPROM after programming Ø Advanced	Device Interface Device signature ATmega2550 ISP Apply Device signature gs Device Erase Chip > Erase now stion Flash (256 KB) CiV2 Firmware/V17.hex CiV2 Firmware/V17.hex CiV2 Firmware/V17.hex CiV2 Firmware/V17.hex CiV2 Firmware/V17.hex Verify Flash after programming ✓ Advanced Verify EEPROM after programming ✓ Verify LEPROM after programming ✓ Verify EEPROM after programming ✓ Advanced	Device Interface Device signature Target Voltage ATmega2560 ISP Apply Dx1E9801 Read 4,8 V Read gs Device Frase Chip Erase Chip Erase Chip Erase now Flash (256 K8) C:VX2 Firmware\V17.hex Vition Vition Vition EPROM (4 K8) C:VX2 Firmware\V17.eeprom.eep Vitify EEPROM after programming Vitify CEPROM after programming Vitify Civit Vitify EEROM after program afte	Device Interface Device signature Target Voltage ATmega2560 ISP Apply 0x1E9801 Read 4.8 V Read gs Device Erase Chip Erase now Flash (256 K8) CAX2 Firmware\V17.hex Firse device before programming ✓ Verify Flash after programming ✓ Verify Flash after programming ✓ Verify EEPROM 4 K8) CAX2 Firmware\V17eeprom.eep ✓ Verify EEPROM 4fter programming ✓ Verify ✓ Verify EEPROM after programming ✓ Verify Sthok K	October Interface Device signature Target Voltage ATmega2560 ISP Apply 0x 1E9001 Read 4.8 V Read gs Device Erase Chip Erase now Flash (256 K8) Verify Erase Chip Verify Read Verify Read V Verify Flash after programming Program Verify Read Verify Read V Verify Flash after programming OK Advanced Verify Read Verify Read V Verify EEPROM after programming OK Advanced Verify Read Verify Read OK shok K X T

You can see the status of the programming process in the lower part of the window

9. To update EEPROM (Settings):

- Open the firmware which we are going to upload by using ... button in the EEPROM (4 KB) section: *in our case it is on C disk in X2 Firmware folder, file in eep format called V17eeprom.eep.*

- Click **Program** button and wait until it is finished

Tool	Device		Interface		Device signature		Target Voltage			
Atmel-ICE ~	ATmega2560	•	ISP v	Apply	0x1E9801	Read	4,8 V Re	ad 🔯		
Interface setting	gs in	Device Erase C	hip ~	Erase now]					
Device informa Oscillator calibi	tion ration	Flash (25 C:\X2 Fi	i6 KB) rmware\V1	7.hex					v	
Memories Fuses		Erase Verif Adv	e device be y Flash afte anced	fore progra er programn	mming ning		Program	Verify	Read	
Lock bits Production file		EEPROM (4 KB) C:\X2 Firmware\V17eeprom.eep								
		✓ Verify EEPROM after programming ✓ Advanced								
rogramming EEI arifying EEPRON	PROMOK 1OK									
 Verifying 	EEPROMO	К								

You can see the status of the programming process in the lower part of the window

10. Switch off the X2 unit, disconnect the programmer and start it again.

Check that on the display you have a new updated version shown (e.g. here we see that it was updated to **V. 2217**):

11. Reassemble the X2.PRO unit back

