



RRANGEMASTER
SYSTEMS

How to set up voice card for Rangemaster X3 system

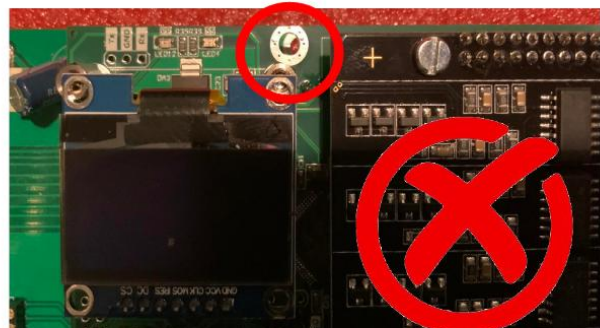
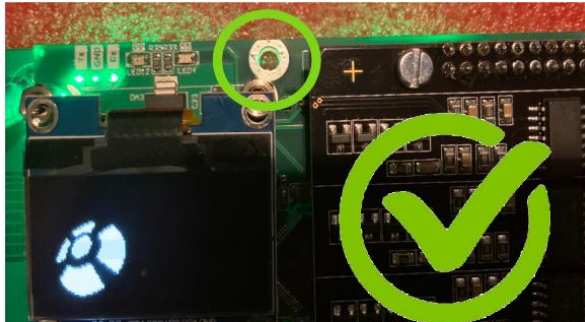
User Manual

Revision date: 22.12.2021

PROFESSIONAL **S**HOOTING **G**ROUND **A**UTOMATION

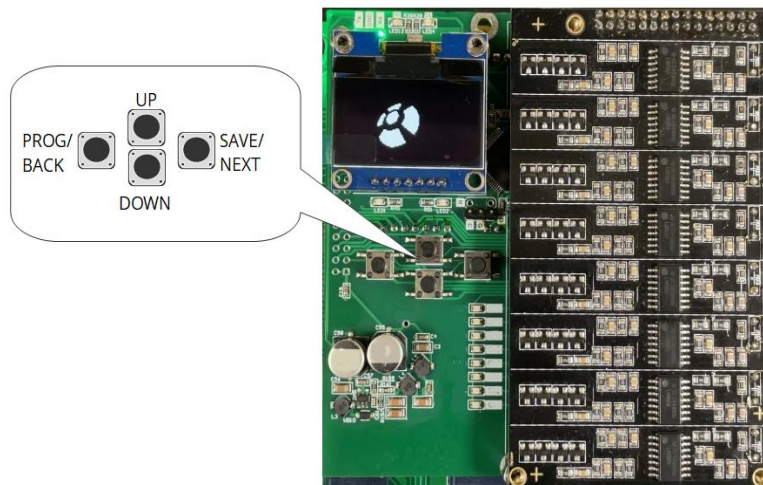
1. VOICE CARD PCB INSTALLATION

It is very crucial to insert the voice card PCB correctly otherwise it may create shortcut and burn down the PCB and the motherboard. When inserting the voice card, make sure that the hole of the PCB matches the hole of the mother board (see picture below):



2. SETTING UP

To set up the voice card use 4 push buttons below the display.



Push button	Description
PROG/BACK	Enter the Setting menu (keep pressed); Go back to the previous section without saving changes (if were made)
UP/DOWN	Scroll back and forth;
SAVE/NEXT	Confirm the choice and save the changes

To enter the setting menu keep pressed **PROG/BACK** button.

	Menu section	Used for
1.	Choose Language	<p>Here you can set up the interface language:</p> <ul style="list-style-type: none"> • English • German (Deutsch) • Russian (Русский) <p>To change the language use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>
2.	Config for	<p>We choose for which discipline we make the settings:</p> <ul style="list-style-type: none"> - SKEET - TRAP - COMPAK <p>To change the discipline use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>
2.1.	Voice Level	<p>Adjusts the voice reception level (sensitivity). Min. value: 10, max. value: 40. Standard value: 20 Lower value – more sensitive, higher value means you have to call louder.</p> <p>To change the value use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>
2.2.	Shot Level	<p>Adjusts the trigger for recognizing a shot. Lower level means that muzzle can be further away from the microphone and still can detect shot positive. E.g. lower values are necessary for subsonic loads. Take care: lower value can give false positive on very loud and long pull calls.</p> <p>Min. value: 10, max. value: 50. Standard value: 20 Shot is recognized – depends on quality of microphones and the quality of cables!</p> <p>To change the value use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>

2.3.	Supress Level	<p>Adjusts suppression level of non active microphones. In very high ambient noise ranges a higher suppression level might be necessary. If the noise level exceeds the number, then the system considers it to be noise. Should be adjusted during windy weather Min. value: 1, max. value: 5. Standard value: 1 Usually keep at 1 To change the value use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>
2.4.	An. frame size	<p>Each frame has a size of 5m/sec. In case of high ambient noise use value 6, in case of low ambient noise reduce it. Min. value: 4, max. value: 6. Standard value: 5 To change the value use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>
2.5*	FFT Noise Mult.	<p>Visible only in quick setup*. Adjusts noise multiplier higher FFT multipliers make system reduces risk of false positive. E.g. when gun is closed close to the active microphone or during windy weather. To change the value use UP/DOWN buttons. To save and go to the next section use SAVE/NEXT button. To go back without saving changes use PROG/BACK button.</p>

* To enter the quick setup menu keep the UP button pressed.

TIPS:

1. In case microphones are too sensitive or not sensitive enough first adjust the value of **Voice level**
2. If you have strong wind adjust **Suppression level** and **FFT Noise Mult.**
3. With low ambient noise and with no strong wind leave **Suppression level** at 1 and **FFT Noise Mult.** At 1.

3. QUICK SETUP MENU

To enter the quick setup menu keep the UP button pressed. It allows to setup the voice card while having microphones not in a random way, but for a specific level of voice, noise, and so on. When setting in quick setup mode the user has the opportunity to observe the detected level of a voice or shot - this is shown by a filled rectangle.



Important: when configuring "on the fly", the system is not triggered.

The user has the ability to observe the LEDs under the display. The lower left LED indicates voice detection, the lower right LED indicates a shot. That is, if the board detects a voice call during configuration, the lower left LED will flash, but the signal will not go to the main board and the user will be able to continue to settings. The same applies to the setting of shots, only the lower right LED will flash.

FFT will only work if you press the UP button while waiting for a voice command. Then the screen will display the inscription FFT, the name of the discipline and the channel number. In this case, it will be possible to observe the spectrum of the signal on the selected channel.

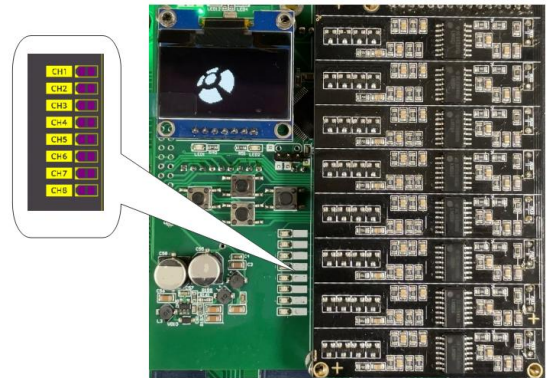
To turn off the FFT mode, press the DOWN button.

The board remembers whether the FFT mode was turned on or off, so after turning the power off and on, the mode that was before shutdown (with or without FFT) will be set.




4. LEDS

There are 8 leds on the pcb with indicate microphones:
 1-8 for skeet and 1-5 for trap and compak.
 In waiting mode all LEDs should be off and blink only
 when target is called or shot is made.
 If inactive microphone LED is on or blinking - there is a
 problem with the microphone.



5. MESSAGES ON THE DISPLAY

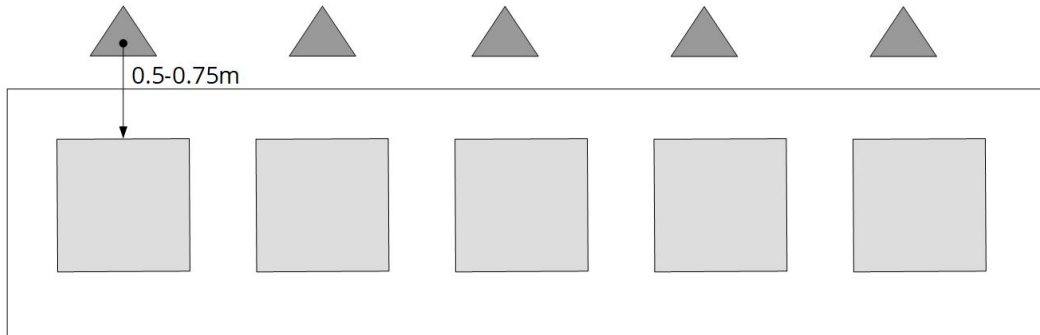
Message on the display	Description
	Waiting mode (moving Rangemaster logo on the display) - no active microphones
Waiting for Call	The system is active. Microphone waiting for voice call
Waiting for Shot	After the voice call while releasing of the target, the system is waiting for a shot to shift to the next microphone
ERROR! Wrong Command	Call Rangemaster manager

6. RECOMMENDED POSITION OF MICROPHONES

To provide the correct work of the system we ask to use the following recommendations for placing the microphones.

TRAP + COMPAK

All microphones should be placed in front of shooting stations. Distance between front edge of the shooting station and the middle of the microphone pedestal should be 0.5-0.75m.

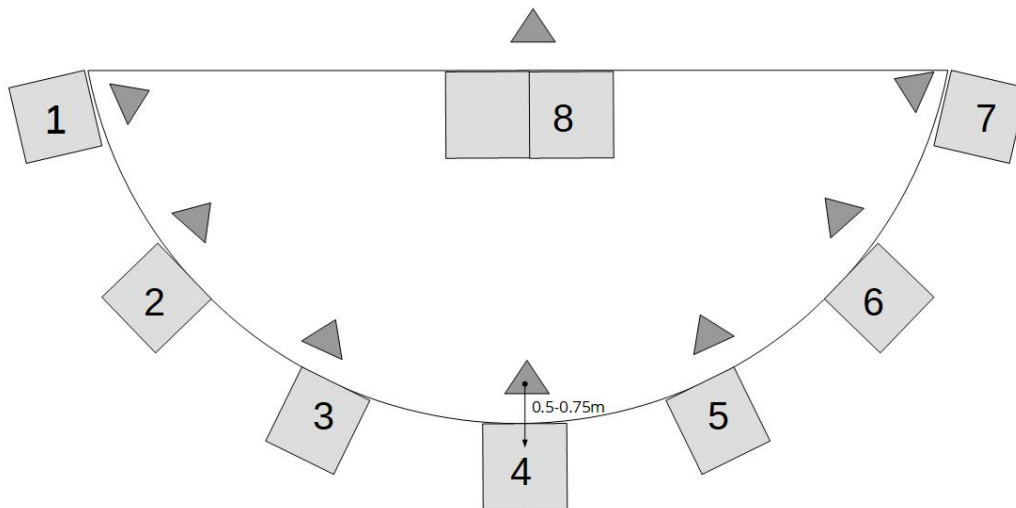


SKEET

Distance between front edge of the shooting station and the middle of the microphone pedestal should be 0.5-0.75m.

Microphones on station 1,4,7,8 should be placed in front of the shooting station. Microphone 2,3 should be placed on the left side from the shooting stations (around 50 cm to the left).

Microphone 5,6 should be placed on the right side from the shooting stations (around 50 cm to the left).




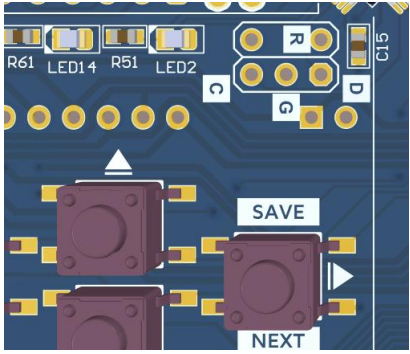
7. SOFTWARE UPDATE (FLASHING OF THE FIRMWARE)

To update the software you need the following hardware and software:

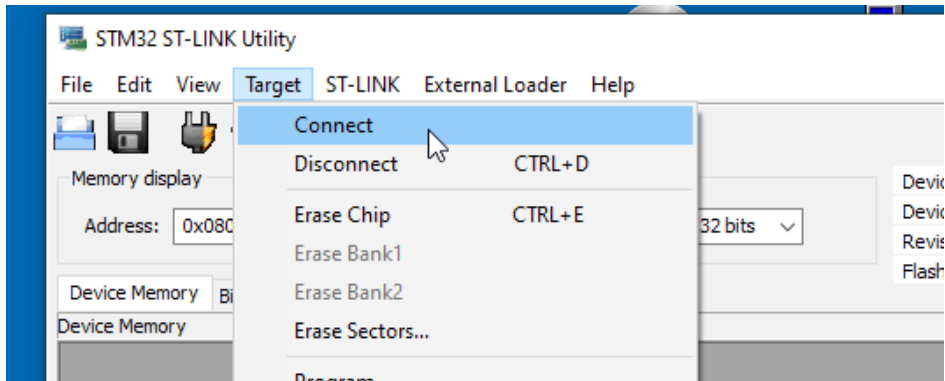
- programmer ST-LINK V2 (you can use clone)
- ST-LINK Utility → to download use the link <https://www.st.com/en/development-tools/stsw-link004.html>
- Latest version of the SW provided by Rangemaster Systems

Steps to flash the firmware:

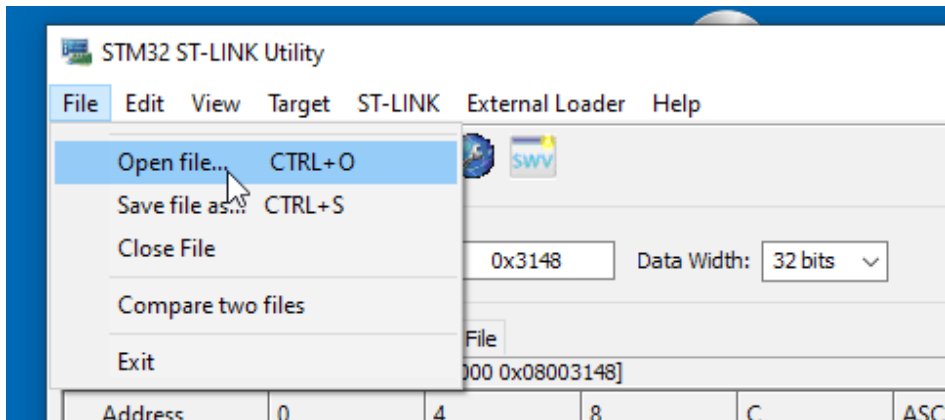
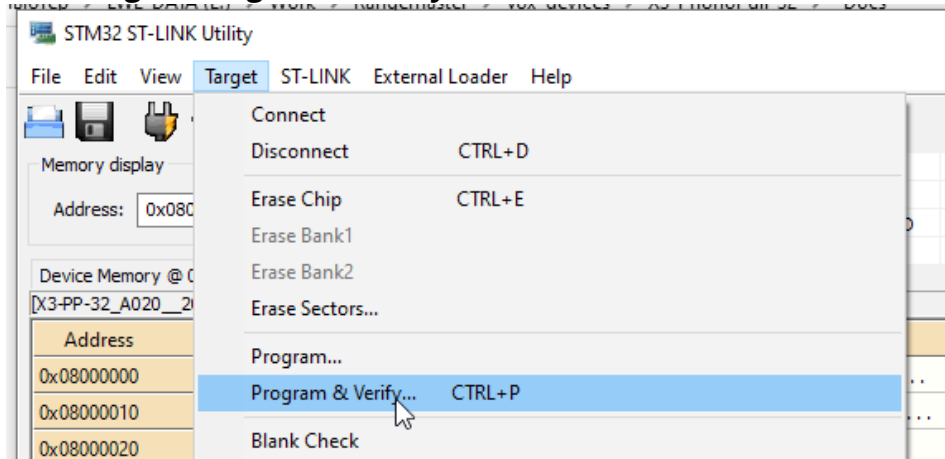
1. Get newest firmware for voice card named "X3-PP-32_A020__2021-11-30.hex"
2. Setup ST-LINK Utility
3. Connect ST-LINK to voice card:

<p>ST-LINK clone</p> 	<p>Voice card</p> 
GND	G
SWCLK	C
SWDIO	D
RST	R

4. Open ST-LINK Utility

5. Click **Target**→**Connect**

6. Choose firmware file

7. Click **Target**→**Program & Verify**8. Click **Start**