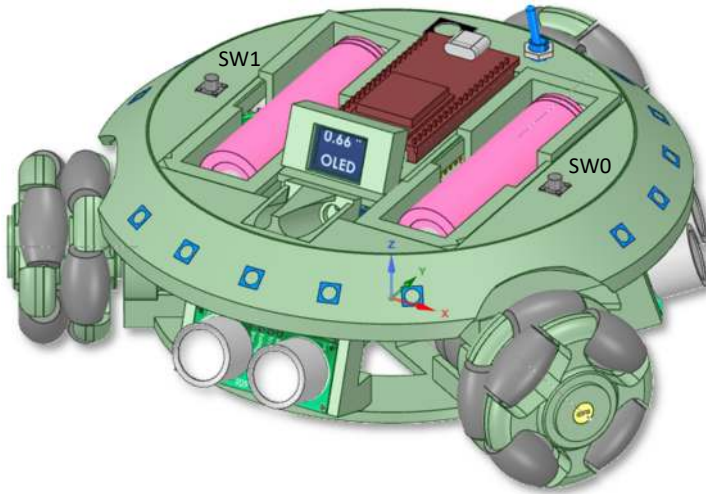


Omni-Bot 3x3 - Functions



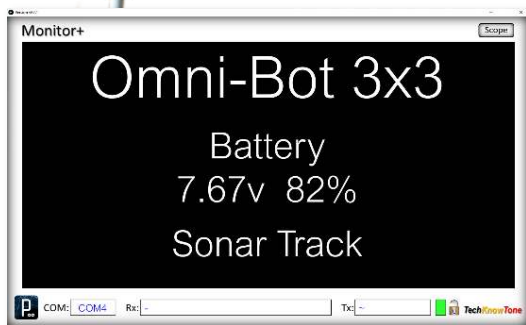
Wii Nunchuk
or Classic



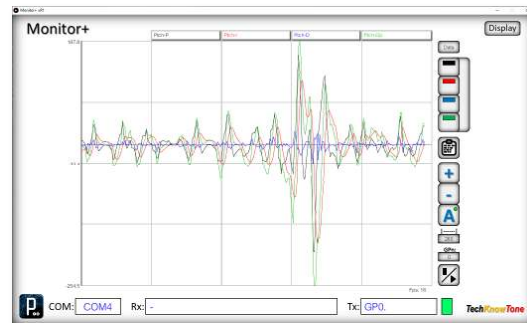
WiFi control
+ telemetry



Light Tracking



Monitor+ app



Tech:

- ESP32 micro, 2-core, 240MHz, 32-bit
- ICM-42607-P 3-axis gyro & accelerometer
- 3 x RCWL-1601 acoustic range finder
- 2 x LDR light sensors
- 3 x 6v DC geared motors (130rpm)
- 3 x 48mm Omni directional drive wheels
- 3 x DRV8833 MOS PWM Dual H-Bridge Drivers
- 0.66" OLED Display – SSD1306 controller
- 15 x WA2812B RGB LEDs
- 2 x 18650 Lithium 3000 mAh batteries
- 3-D printed design/construction

Features:

- SW0: selects main modes
 - Light sensors & tracking
 - RCWL acoustic range sensors
 - Auto-drive mode
- SW1: selects sub-modes
 - Displays show mode selected
- Wii controller steering, 'C+Z' speed adjust
- Omni-directional steering, using left joystick
- Controller 'live' recording, and replay action
- Battery sensing with PWM adjust & cut-off

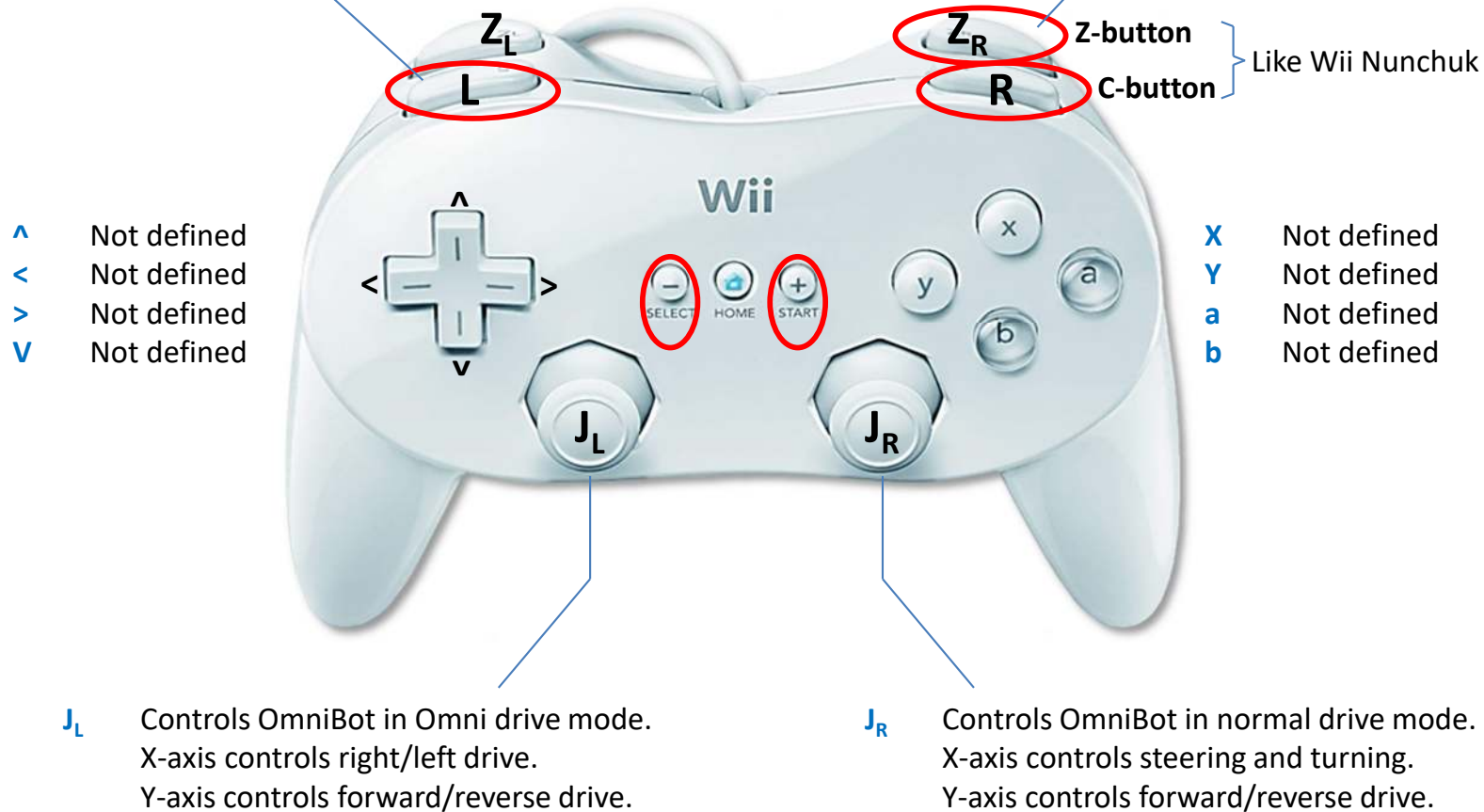
Enhancements:

- TBD.

Omni-Bot – Wii Classic Pro Functions

- L** HELD, + **START** initiates RECORD mode.
- L** pressed stops active RECORD mode.
- START** Plays a recording.
- ANY** Stops a playing recording.

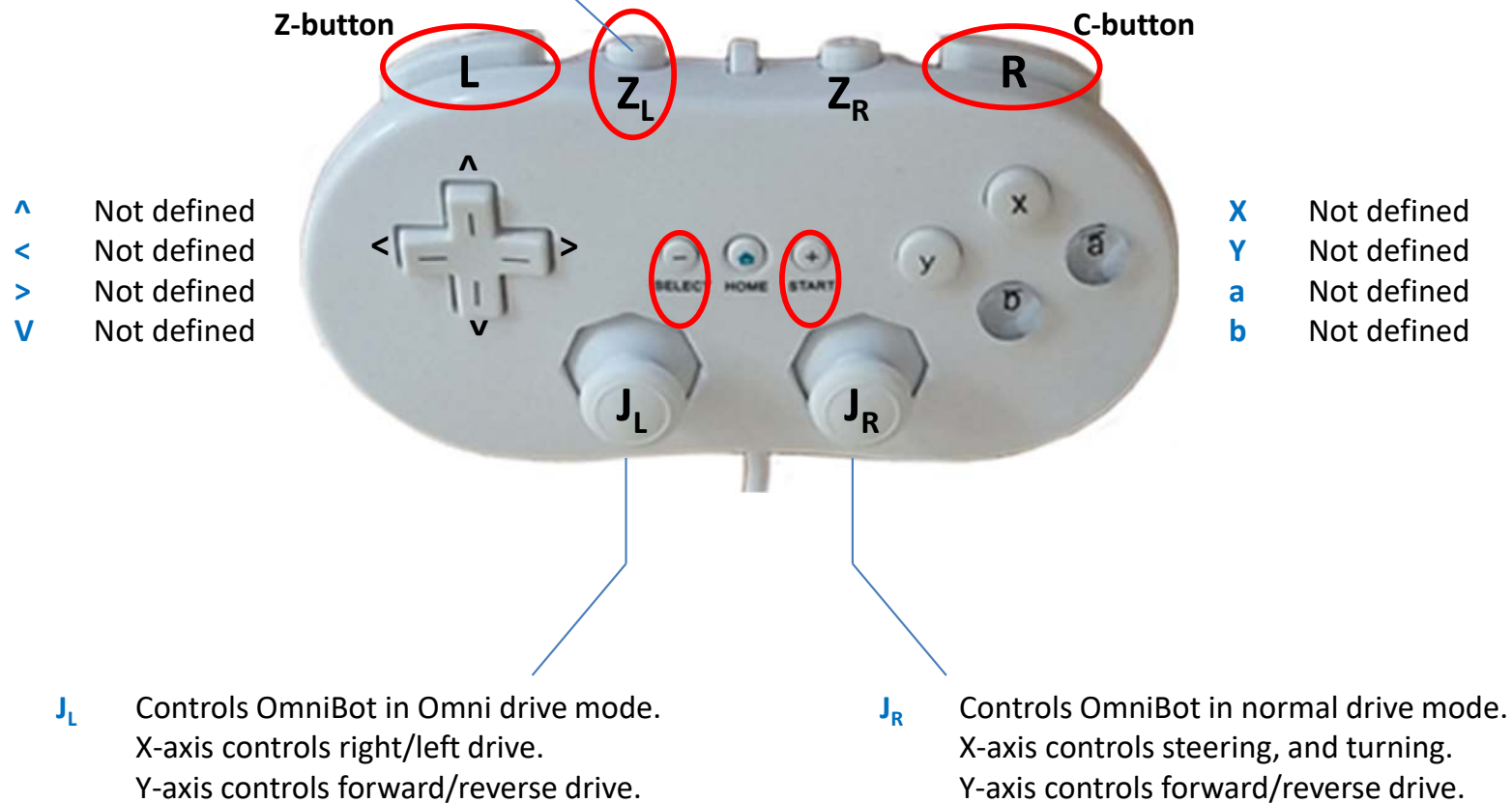
- R** HELD, connects WiFi
- R+Z_R** HELD disconnects WiFi
- When connected:
- R** Increases 'Gear' value
- Z_R** Decreases 'Gear' value
- Select + R** Gear Max mode
- Select + Z_R** Gear Min mode



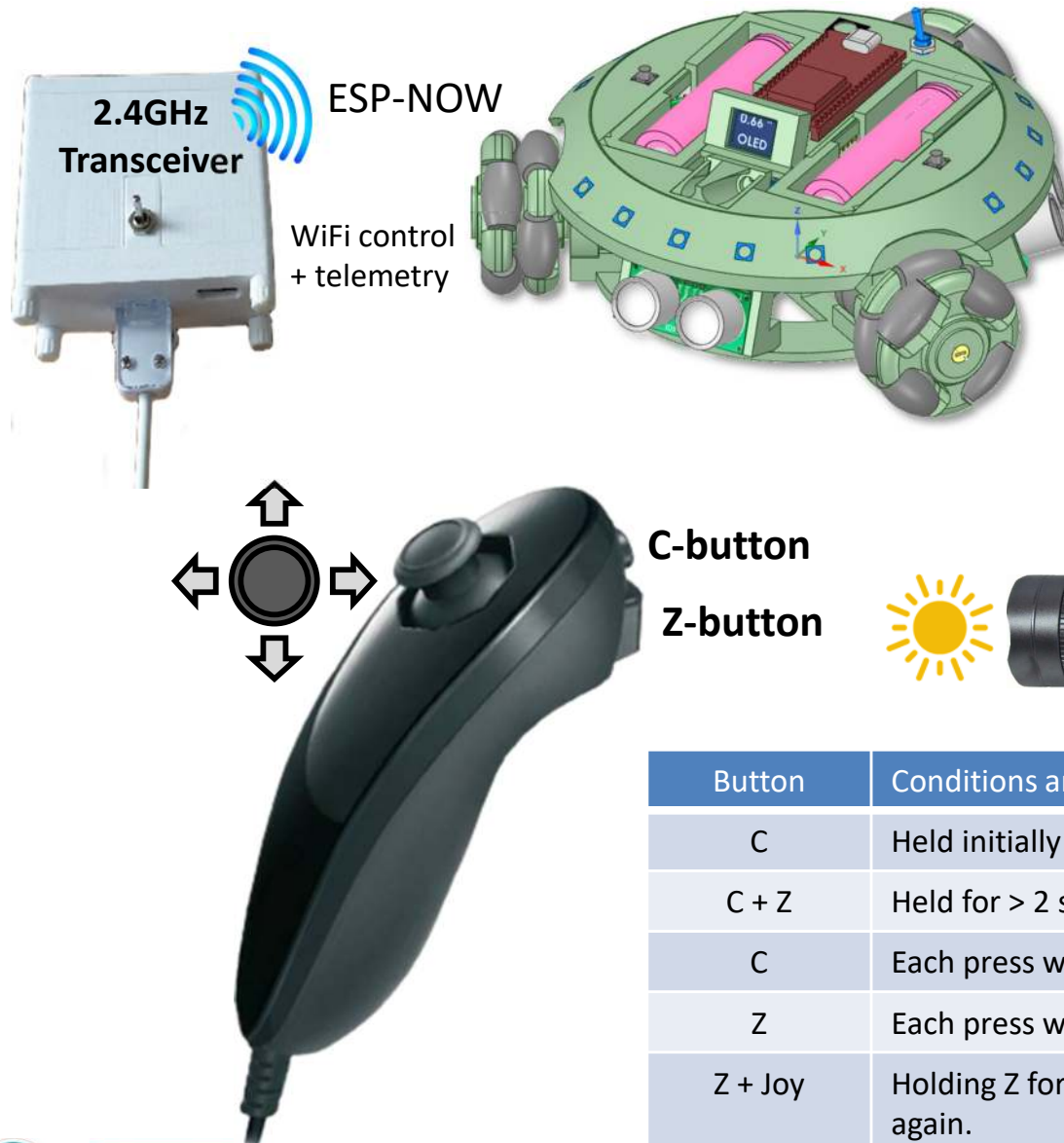
Omni-Bot – Wii Classic Functions

Z_L HELD, + **START** initiates RECORD mode.
Z_L pressed stops active RECORD mode.
START Plays a recording.
ANY Stops a playing recording.

R HELD, connects WiFi
R+Z_R HELD disconnects WiFi
 When connected:
R Increases 'Gear' value
Z_R Decreases 'Gear' value
Select + R Gear Max mode
Select + Z_R Gear Min mode



Omni-Bot – Nunchuk Functions

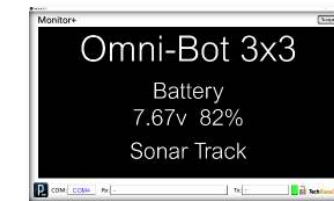


Features:

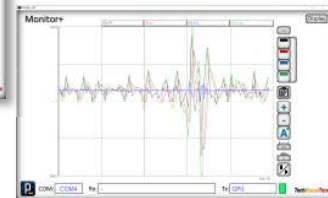
- SW0: selects main modes
 - Light sensors & tracking
 - RCWL acoustic range sensors
 - Auto-drive mode
- SW1: selects sub-modes
 - Displays show mode selected
- Wii controller steering, 'C+Z' speed adjust
- Joystick controls direction and steering
- Battery sensing with PWM adjust & cut-off

Limitations:

- Record and Play modes are not implemented.

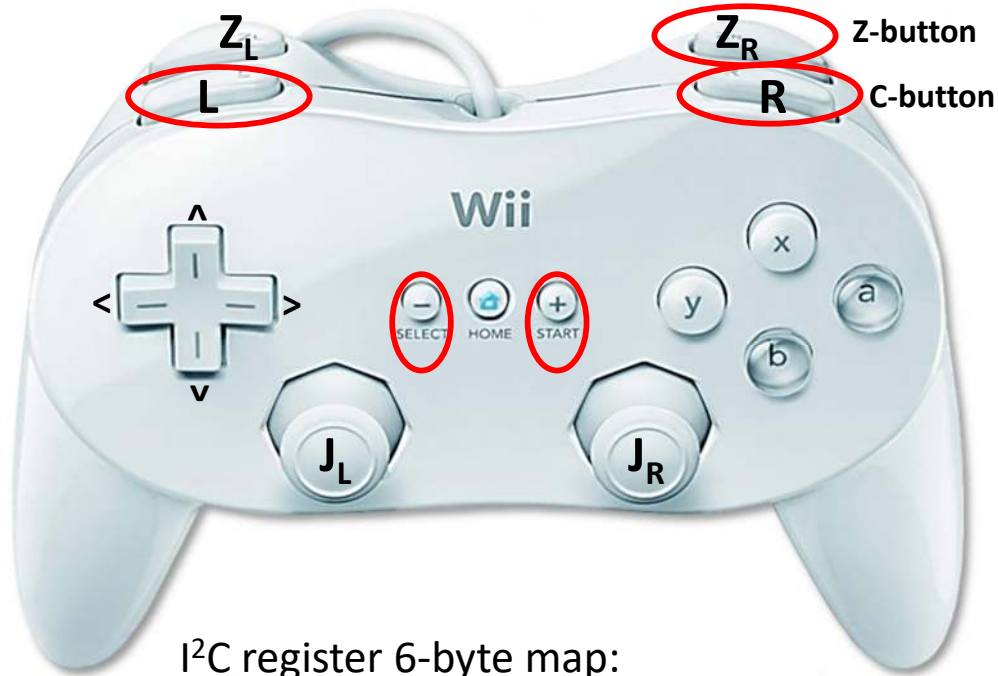


Monitor+ app



Button	Conditions and responses
C	Held initially for > 1 second to connect Wii controller to Omni-Bot, and go 'active'.
C + Z	Held for > 2 seconds will return the Omni-Bot to an 'inactive' safe state.
C	Each press will increase the responsiveness of the Omni-Bot from 1 – 5 (max).
Z	Each press will decrease the responsiveness of the Omni-Bot 5 – 1 (min).
Z + Joy	Holding Z for > 2 seconds toggle the driving modes from Normal to Omi, and back again.

Omni-Bot – Wii Classic Pro Functions



I²C register 6-byte map:

Bit							
7	6	5	4	3	2	1	0
RX<4:3>				LX<5:0>		RxWiFi[0]	
RX<2:1>				LY<5:0>		RxWiFi[1]	
RX<0>	LT<4:3>				RY<4:0>		RxWiFi[2]
LT<2:0>				RT<4:0>		RxWiFi[3]	
BDR	BDD	BLT	B-	BH	B+	BRT	1 RxWiFi[4]
BZL	BB	BY	BA	BX	BZR	BDL	BDU RxWiFi[5]

LX,LY are the left Analog Stick X and Y (0-63), RX and RY are the right Analog Stick X and Y (0-31), and LT and RT are the Left and Right Triggers (0-31). The left Analog Stick has twice the precision of the right Stick.

BD{L,R,U,D} are the D-Pad direction buttons. B{ZR,ZL,A,B,X,Y,+,H,-} are the discrete buttons. BL{LT,RT} are the digital button click of LT and RT. All buttons are 0 when pressed.

Wii Classic Pro functions:

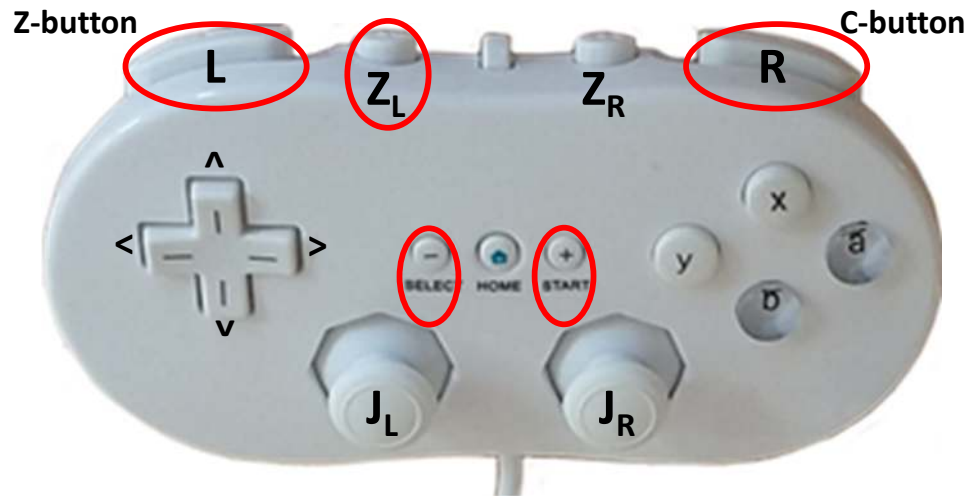
OmniBot system default is Wi-Fi RC disconnected.

- **R** – held in, will connect OmniBot over ESP-NOW Wi-Fi.
- **R** + **Z_R** – held in, will disconnect RC over Wi-Fi.

When connected:

- **J_L** – provides omni-drive mode.
- **J_R** – provide normal drive mode.
- **R** – increases Gear value, if less than Gear Max.
- **Z_R** – decreases Gear value, down to 1.
- **Select** + **R** gives Gear Max control.
- **Select** + **Z_R** sets Gear Min control.
- **L** + **Start** – begins a controller recording.
- **L** – ends a controller recording.
- **Start** – plays a recording, if one exists.
- **^** - performs an omni forward rectangle move.
- **>** - performs a random neutral right turn, then back.
- **V** – performs an omni reverse rectangle move.
- **<** - performs a random neutral left turn, then back.

Omni-Bot – Wii Classic Functions



I²C register 6-byte map:

Bit							
7	6	5	4	3	2	1	0
RX<4:3>				LX<5:0>		RxWiFi[0]	
RX<2:1>				LY<5:0>		RxWiFi[1]	
RX<0>	LT<4:3>				RY<4:0>		RxWiFi[2]
LT<2:0>				RT<4:0>		RxWiFi[3]	
BDR	BDD	BLT	B-	BH	B+	BRT	1 RxWiFi[4]
BZL	BB	BY	BA	BX	BZR	BDL	BDU RxWiFi[5]

LX,LY are the left Analog Stick X and Y (0-63), RX and RY are the right Analog Stick X and Y (0-31), and LT and RT are the Left and Right Triggers (0-31). The left Analog Stick has twice the precision of the right Stick.

BD{L,R,U,D} are the D-Pad direction buttons. B{ZR,ZL,A,B,X,Y,+,H,-} are the discrete buttons. BL{LT,RT} are the digital button click of LT and RT. All buttons are 0 when pressed.

Wii Classic Pro functions:

OmniBot system default is Wi-Fi RC disconnected.

- **R** – held in, will connect OmniBot over ESP-NOW Wi-Fi.
- **R** + **L_R** – held in, will disconnect RC over Wi-Fi.

When connected:

- **J_L** – provides omni-drive mode.
- **J_R** – provide normal drive mode.
- **R** – increases Gear value, if less than Gear Max.
- **Z_R** – decreases Gear value, down to 1.
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