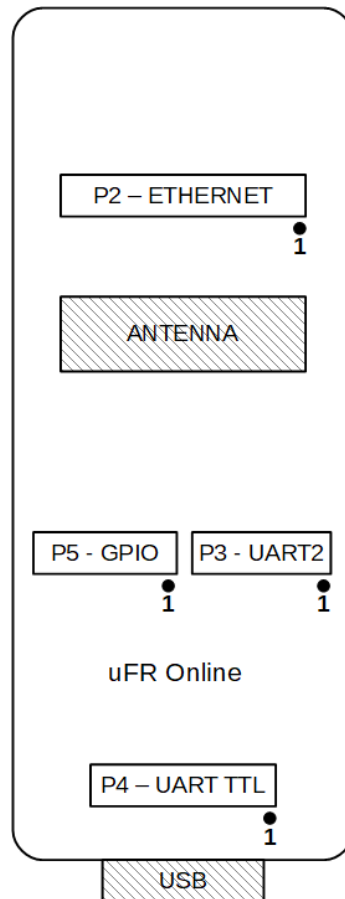# uFR Online pins and connectors description

Version 1.7

Table of contents

Connectors location

Available pins

In the table below is a list of available pins on uFR Online.

User available uFR Online pins		
WROOM-32	**WROVER-E**	**Description**
GPIO36	GPIO36	External input pin 1
GPIO39	GPIO39	External input pin 2
GPIO34	GPIO34	Connected to uFR reader TX
GPIO35	GPIO35	Connected to external UART TX
GPIO32	GPIO32	Connected to uFR reader reset
GPIO33	GPIO5	External input/output pin 3
GPIO13	GPIO13	Connected to internal RGB LED
GPIO2	X	External output pin 6
GPIO16	GPIO33	Connected to uFR reader RX
GPIO5	GPIO18	External input/output pin 4
GPIO18	X	External input/output pin 5
GPIO3	GPIO3	Connected to Serial to USB FTDI RX
GPIO1	GPIO1	Connected to Serial to USB FTDI TX
GPIO23	GPIO23	Connected to external UART RX
*WROOM-32 has 6 and WROVER-E has 4 external pins.		

User programmable pins

In the table below is a list of user programmable pins on OEM unlocked uFR Online.
January 2021 update: We upgraded the ESP32 SoC on Nano Online from ESP32-WROOM-32 to ESP32-WROVER-E

UART 1 - Internally connected to uFR Reader		
WROOM-32	**WROVER-E**	**Description**
GPIO34	GPIO34	Connected to uFR Reader TX
GPIO32	GPIO32	Connected to uFR Reader reset
GPIO16	GPIO33	Connected to uFR reader RX

UART 2 - connected external P3 connector			
P3 Pin number	**WROOM-32**	**WROVER-E**	**Description**
1	X	X	Connected to 5V power supply
2	GPIO35	GPIO35	Connected to external UART TX
3	GPIO23	GPIO23	Connected to external UART RX
4	GPIO32	GPIO32	Connected to uFR Reader reset
5	X	X	Connected to GND

Input/Output pins - connected external P5 connector			
P5 Pin number	**WROOM-32**	**WROVER-E**	**Description**
1	GPIO36	GPIO36	External input pin 1
2	GPIO39	GPIO39	External input pin 2
3	GPIO33	GPIO5	External input/output pin 3
4	GPIO5	GPIO18	External input/output pin 4
5	GPIO18	X	External input/output pin 5. From firmware version 2.7.6, RGB LEDs can be connected
6	GPIO2	X	External output pin 6

Input/Output pins additional features

In the table below is a list of additional features available for Input/Output pins on OEM unlocked uFR Online.

January 2021 update: We upgraded the ESP32 SoC on Nano Online from ESP32-WROOM-32 to ESP32-WROVER-E

Input/Output pins - additional features		
P5 Pin number	**List of features - WROOM-32**	**List of features - WROVER-E**
1	Deep sleep wake-up, ADC	Deep sleep wake-up, ADC
2	Deep sleep wake-up, ADC	Deep sleep wake-up, ADC
3	Deep sleep wake-up, ADC, Touch sensor, PWM, I2C	PWM, I2C
4	PWM, I2C	PWM, I2C
5	PWM, I2C	X
6	Deep sleep wake-up, ADC, Touch sensor, PWM, I2C	X
*WROOM-32 has 6 and WROVER-E has 4 external pins.		

Non-programmable pins

In the table below is a list of pins that are internally conencted and not user programmable pins on OEM unlocked uFR Online.

External P4 connector. Only available on UART TTL version without USB connector	
P4 Pin number	**Description**
1	External 5V power supply
2	UART TX Pin
3	UART RX Pin
4	UART RESET Pin
5	GND
6	UART DTR Pin

External P2 connector. Only available on Ethernet version with dedicated LAN adapter.	
P2 Pin Number	**Description**
1	Ethernet TX/ RX Positive Channel 1
2	Connected to 3.3V power supply
3	Ethernet TX/ RX Negative Channel 1
4	Ethernet TX/ RX Positive Channel 2
5	Ethernet TX/ RX Negative Channel 2
6	LED1. Active when a valid link is detected and blinks when activity is detected
7	LED2. Active when the speed is 100Mbps. Inactive when the speed is 10Mbps
8	External 5V power supply
9	External 5V power supply
10	Conencted to GND

Unlocked device GPIOs description

In the table below is a list of internal connected GPIOs on OEM unlocked uFR Online.
January 2021 update: We upgraded the ESP32 SoC on Nano Online from ESP32-WROOM-32 to ESP32-WROVER-E

Unlocked device internal pins		
Connected to	**WROOM-32 GPIO**	**WROVER-E GPIO**
RGB LED	GPIO13	GPIO13
UART1 TX/RX (internal spring connector)	GPIO34/GPIO16	GPIO34/GPIO33
UART2 TX/RX (P3 connector)	GPIO35/GPIO23	GPIO35/GPIO23
External IO (P5 connector)	GPIOs 36, 39, 33, 5, 18, 2	GPIOs 36, 39, 5, 18
I2C bus SDA/SCL	GPIO12/GPIO14	GPIO12/GPIO14
*Ethernet MDC/MDIO/Oscillator enable	**GPIO15/GPIO4/x	***GPIO15/GPIO4/GPIO2
*uFR Online uses LAN8720 PHY IC ****WROM-32 uses GPIO17 to generate clock for LAN8720** *****WROVER-32 uses external 50MHz oscillator and GPIO0 for clock input**		

Revision history

Date	Version	Comment
2019-07-15	1.0	Base document
2021-03-12	1.1	WROVER-E version pins description added
2021-05-06	1.2	Ethernet connector pinout added
2021-08-25	1.3	Unlocked device internal GPIOs description
2022-04-05	1.4	UART2 power supply changed to 5V
2022-04-08	1.6	UART RTS renamed to UART Reset
2022-05-06	1.7	GPIO18 RGB LED support added