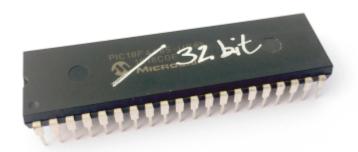
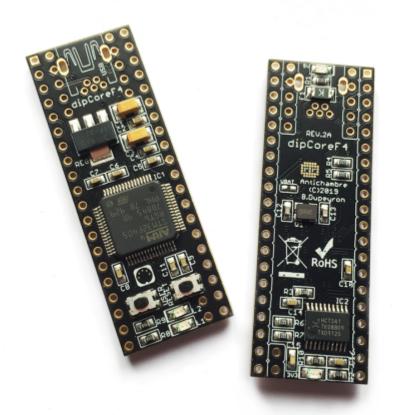
2025/11/01 15:03 1/10 dipCoreF4

dipCoreF4

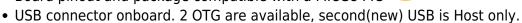


A reduced Core for your MIDIbox App, an STM32F405RG in a DIP40 format.



Features

- MIOS32 uses same processor family and drivers(no deep change).
- Same internal hardware as Disco or wCore (speed, memory, peripherals, etc...) .
- Board pinout and package compatible with a MIOS8 PIC



- Last update: 2020/05/23 08:13
 - 5V power input and led.

• 3.3V regulator and led on board.

- 74HCT541 on board for the 5V output ports.
- User and Reset buttons.
- 2 user leds.
- 12 extra pins for USB, buttons and leds.
- Your favorite Core is now a current component easy to integrate.

All commons MIOS32 ports are available except:

- General purpose J10x ports were removed.
- LCD port was reduced to a serial one, no more pins J15.D0-D7, no back-light power supply.
- 2 UART only(2 MIDI In/2Out).
- 2 AIN channels only(e.g. pedal inputs).
- SPI slave only supported by J19(SPI3).



Check the dipBoardF4 for more details

Download

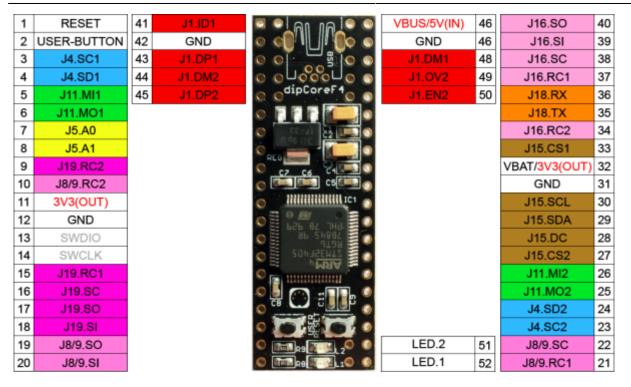
dipCoreF4 eagle lib for easy integration in your design.

dipcoref4 v2a.zip

Pinout

The dipCoreF4 and the legacy MIOS32 ports.

2025/11/01 15:03 3/10 dipCoreF4



Check dipBoardF4 for more details about the connectors.

First, was a chart.

This chart gives you the equivalence between the different pinout and functions.



	PIC / MIOS8				STM32F	4 / MIC	0\$32		
				dipCoreF4			DISCO / wCor	Δ	
				dipcorer 4			DISCO? WCO!		
					_	_			
		_	4	3 g	32 Jion	100	F (5		
DIP 40		DIP 40	QFP64	STMB2 F415RG	MOS32 Function	LQFP100	STM32F 407VG	Discovery	
	MIOS8 Function			S T	2 ₫			F4 Pin	Pin name
ΨĪ	Y 5	*	_	~	_	~	~	~	~
2	J5 RA0	2	14	GPIO	USER BUTT	23	USER BUTT	P1.12	PA0(6)-WKUP(5)
3	J5 RA1	3	58	I2C1_SCL	J4B.SC	92	I2C1_SCL	P2.23	PB6
	J5 RA2 J5 RA3	1	59 17	I2C1_SDA USART2_RX	J4B.SD J11.MI1	93 26	USARTI_RX USART2 RX	P2.24 P1.13	PB7 PA3(5)
6	J5 RA4	- J	16	USART2_TX	J11.MO1	25	USART2_TX	P1.14	PA2(5)
7	J5 RA5	7	15	ADC123_IN1	J5.A0	24	ADC123_IN1	P1.11	PA1(5)
8	J5 RE0	8	25	ADC12_IN15	J5.A1	34	ADC12 IN15	P1.19	PC5(5)
9	J5 RE1	9	40	SP3_RC2(GPIO)	J19.RC2	66	LCD:SER/E2	P2.46	PC9
10	J5 RE2	10	26	SPI2_RC2(GPIO)	J8/9.RC2	35	ADC12_IN8	P1.22	PB0(5)
13	OSC1	13	46	JTMS-SVDIO		72	JTMS-SVDIO	P2.42	PA13
14	OSC2	14	49	JTCK-SWCLK		76	JTCK-SWCLK	P2.39	PA14
15	J6/7_RC	15	50	SPI3_:RCI(NSS)	J19.RC1	77	SPI3_NSS:RC1	P2.40	PA15
16	J6/7_SC	16	55	SPI3_SCK	J19.SC	89	SPI3_SCK	P2.28	PB3
17	J6/7_SO	17	57	SPI3_MOSI	J19.SO	91	SPI3_MOSI	P2.26	PB5
18	J6/7_SI	18	56	SPI3_MISO	J19.SI	90	SPI3_MISO	P2.25	PB4
19	J8/9 S0	19	11	SPI2_MOSI	J8/9.SO	18	N.U.	P1.9	PC3(5)
20	J8/9 SI	20	10	SPI2_MISO	J8/9.SI	17	ADC123_IN12	P1.10	PC2(5)
21	J8/9 RC	21	27	SPI2_RCI(GPIO)	J8/9.RC1	36	ADC12_IN9	P1.21	PB1(5)
22	J8/9 SC J10 SC	22	34	SPI2_SCK	J8/9.SC	52	SPI2_SCK	P1.37	PB13
23	J10 RC	23	30	I2C2_SDA	J4A,SC	48	I2C2_SDA	P1.35	PB11
24	J10 SO	24	29	I2C2_SCL	J4A,SD	47	I2C2_SCL	P1.34	PB10
25 26		25	51 52	UART4_TX	J11.MO2	78	DAC_CK(discovery)	P2.37	PC10
27	J11 RX J14	26 27	8	UART4_RX GPIO	J11.MI2 J15.CS2	79 15	OTG_FS_EN	P2.38 P1.8	PC11 PC0(5)
28	J15 RS J10 MD	28	54	GPIO	J15.DC	83	UART5_RX	P2.34	PD2
29	J15 RW J10 MO	29	53	GPIO	J15.SDA	80	UART5_TX	P2.35	PC12
30	J15 E	30	9	GPIO	J15.SCL	16	ADC123_IN11	P1.7	PC1(5)
33	J15 D0	33	33	GPIO	J15.CS1	51	SPI2_NSS:RC1	P1.36	PB12
34	J15 D1	34	24	SPI1_RC2(GPIO)	J16.RC2	33	ADC12_IN14	P1.20	PC4(5)
35	J15 D2	35	62	CANI_TX	J18.TX	96	12C1_SDA	P2.20	PB9
36	J15 D3	36	61	CANI_RX	J18.RX	95	SP3_RC2	P2.19	PB8
37	J15 D4	37	20	SPI1_RC1(NSS)	J16.RC1	29	ADC12_IN4	P1.16	PA4(5)
38	J15 D5	38	21	SPI1_SCK	J16.SC	30	SPI1_SCK	P1.15	PA5(5)
39	J15 D6	39	22	SPII_MISO	J16.SI	32	SPII_MOSI	P1.17	PA7(5)
40	J15 D7	40	23	SPII_MOSI	J16.SO	31	SPII_MISO	P1.18	PA6(5)
		41	43	OTG_FS_ID	JIJD1	69	OTG_FS_ID	P2.41	PA10
		43	45	OTG_FS_DP	J1.DP1	71	OTG_FS_DP	CN5 (USB)	PA12
		44	35	OTG_HS_DM	J1.DM2	53	SPI2_MISO	P1.38	PB14
		45	36	OTG_HS_DP	J1.DP2	54	SPI2_MOSI	P1.39	PB15
		46	42	OTG_FS_VBUS OTG_FS_DM	J1.VBUS J1.DM1	68 70	OTG_FS_VBUS OTG_FS_DM	P2.44 CN5 (USB)	PA9 PA11
		49	3	OTG_HS_DIM	J1.0C2	8	J10/D9	P2.9	PC14(3)-OSC32_IN(5)
		50	4	OTG_HS_EN	J1;EN2	9	J107D10	P2.10	PC15(3)-OSC32_OUT(5)
		51	38	LED BLUE	LED.2	64	DAC_MCK(discovery)	P2.48	PC7
		52	37	LED RED	LED.1	63	USART6_TX	P2.47	PC6
			2	N.U.		7	J10/D8	P2.12	PC13(3)
			5	OSC_IN		12	N.U.	P2.7	PH0(5)-OSC_IN
			6	OSC_OUT		13	N.U.	P2.8	PH1(5)-OSC_OUT
			28	N.U.		37	SPI1_RC1	P1.24	PB2
			39	N.U.		65	LCD:SER/E1	P2.45	PC8
			41	N.U.		67	LCD:RS	P2.43	PA8

BOM

Due to the small SMD, which is sometime a difficulty to solder, the board is already assembled by

2025/11/01 15:03 5/10 dipCoreF4

manufacturer, except the connectors.

The mini-USB is optional.

Qty	Value	Package	Parts	Mouser	Reichelt	Conrad	LCSC	Notes
Hea	ders					•		
3	1*20	male		437-3501012000006101			No!	Adapted to sockets Mill- Max 0552-1-15-01-11-27-10-0 or 0553-1-15-15-11-27-10-0
Con	nnector							
1	mini-USB	тнт	USB	571-1734510-1			no!	for other ref take care about restricted area!

Installing the MIOS32 Bootloader

All dedicated MIDIBox Cores, must have pre-programmed bootloader in order to communicate in MIDI with MIOS-Studio

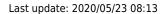
Like the Waveshare, the dipCoreF4 has no programmer onboard.

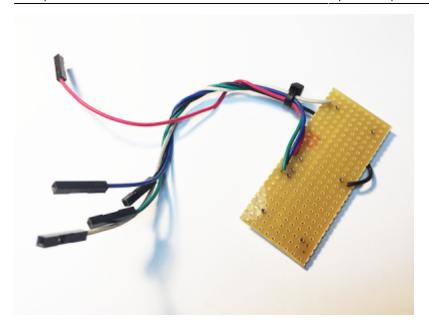
Even if the dipCoreF4 is now provided with it, better to explain connection and process.

You will need:

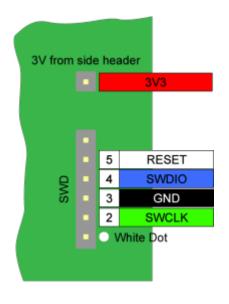
- A ST-LINK/V2 SWD interface, dedicated programmer/debugger or any equipped Discovery/Nucleus board.
- The ST-Link Software.
- Bootloader hex file for dipCoreF4
- 5 Grabber clips or an home-made adapter board.

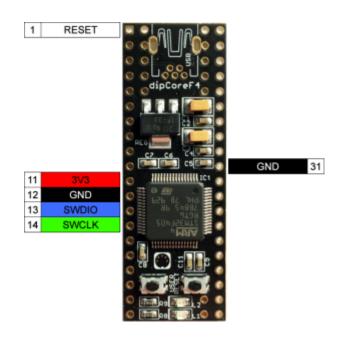






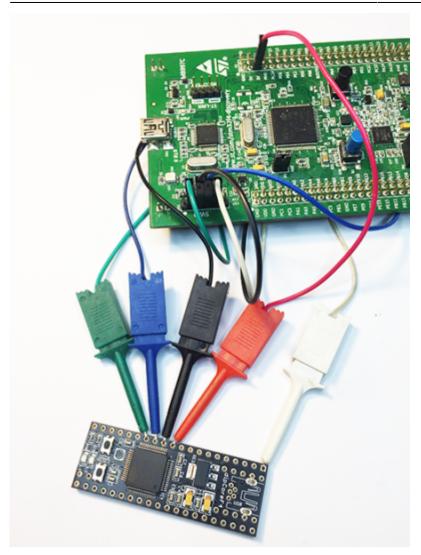
Disco/Nucleus and dipCoreF4 SWD Pinout and connection





Example:

2025/11/01 15:03 7/10 dipCoreF4



Flashing



If you use a Disco or Nucleus board, those jumpers must

be removed.

Once the dipCoreF4 is correctly connected refer to uCapps STM32F4 Based Core page > Installing the MIOS32 Bootloader where the flashing process is already well explained. please use dedicated bootloader hex file

Last update: 2020/05/23 08:13

407VG vs 405RG

Legacy STM32F407 and 405 share the same characteristics.

The 405RG is a TQFP64, a 10x10mm package and only 64 pins.

No Ethernet MAC and camera interface.

2025/11/01 15:03 9/10 dipCoreF4

Show Differences	\$TM32F405RG ×	\$TM32F407VG X
a sion billiones		High-performance foundation line, ARM
Description	High-performance foundation line, ARM Cortex-M4 core with DSP and FPU, 1 Mbyte Flash, 168 MHz CPU, ART Accelerator	Cortex-M4 core with DSP and FPU, 1 Mbyte Flash, 168 MHz CPU, ART Accelerator, Ethernet, FSMC
Package	LQFP 64 10x10x1.4	LQFP 100 14x14x1.4
Core	Arm Cortex-M4	Arm Cortex-M4
Operating Frequency (MHz) (Processor speed)	168	168
Co-Processor type	-	-
Co-Processor frequency (MHz) (max)	-	-
FLASH Size (kB) (Prog)	1024	1024
Data E2PROM (B) (nom)	-	-
RAM Size (kB)	192	192
Timers (typ) (16 bit)	12	12
Timers (typ) (32 bit)	2	2
Other timer functions	2 x WDG, 24-bit down counter, RTC	2 x WDG, 24-bit down counter, RTC
A/D Converters (12-bit channels)	16	16
A/D Converters (16-bit channels)	-	-
D/A Converters (typ) (12 bit)	2	2
Comparator	-	-
VOs (High Current)	51	82
Display controller	-	-
CAN (typ)	2	2
CAN FD (typ)	-	-
I2C (typ)	3	3
SPI (typ)	3	3
2\$ (typ)	2	2
U\$B Type	USB OTG FS + USB OTG FS/HS	USB OTG FS + USB OTG FS/HS
USART (typ)	4	4
UART (typ)	2	2
Connectivity supported	-	-
integrated op-amps	-	-
Additional Serial Interfaces	-	Ethernet
Parallel Interfaces	FSMC, SD/MMC	FSMC, SD/MMC
Crypto-HASH	-	-
TRNG (typ)	true	true
SMPS	-	-
Supply Voltage (V) (min)	1.8	1.8
Supply Voltage (V) (max)	3.6	3.6
Supply Current (µA) (typ) (Lowest power mode)	1.7	1.7
Supply Current (μΑ) (typ) (Run mode (per Mhz))	215	215
Operating Temperature (°C) (min)	-40	-40
Operating Temperature (°C) (max)	105	105
A/D Converters (typ)	-	-
Number of Channels (typ)	-	-
A/D Converters (typ)	_	_

ST STM32F4xx series

Last update: 2020/05/23 08:13

In MIOS32

We use the same peripheral drivers same family, some compilation defined conditions were added for the specific pinout and type, number of ports. toDo

For any questions, informations or observations do not hesitate to contact me (Forum). Antichambre.

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