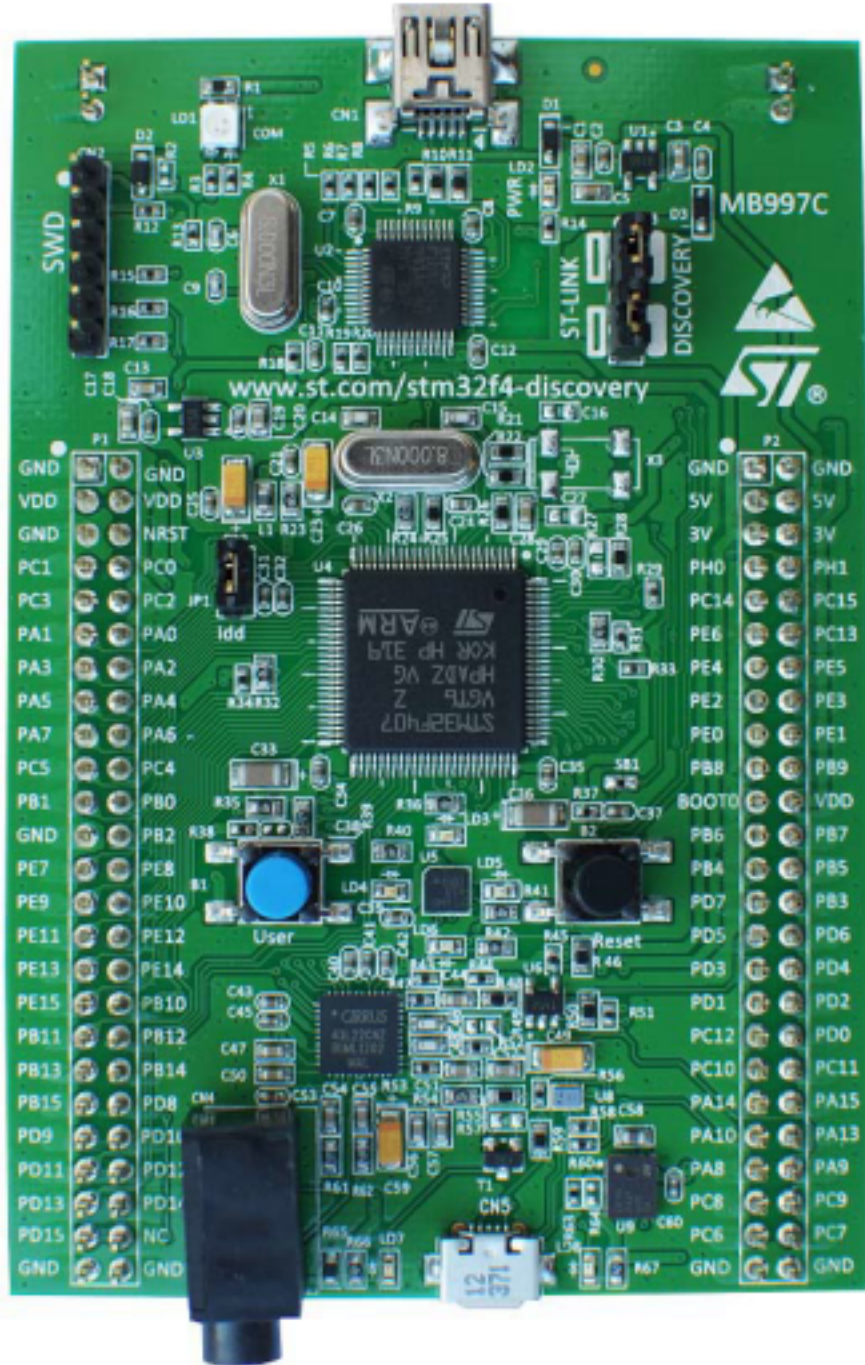


# Gömülü Sistemler Kart Özellikleri

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- STM32F407VGT6
- Core: ARM®32-bit Cortex®-M4 CPU with FPU
- 168 MHz microcontroller, 1 MB of Flash memory, 192 KB of RAM
- On-board ST-LINK/V2 (SWD connector for programming and debugging)
- Hareket sensörü 3-eksek dijital ivme ölçer
- Audio sensor, Dijital mikrofon
- 4 Kullanıcı LEDi, 1 Reset 1 Kullanıcı butonu
- A-I arası portlar, her portta 16 pin

# Gömülü Sistemler Kart Özellikleri



## STM32 F4 DISCOVERY

Yeşil LED PD12 pinine,

Turuncu LED PD13 pinine,

Kırmızı LED PD14 pinine

Mavi LED PD15 pinine

Kullanıcı butonu (mavi buton)

PA0 pinine bağlıdır.

# GPIO Programlama

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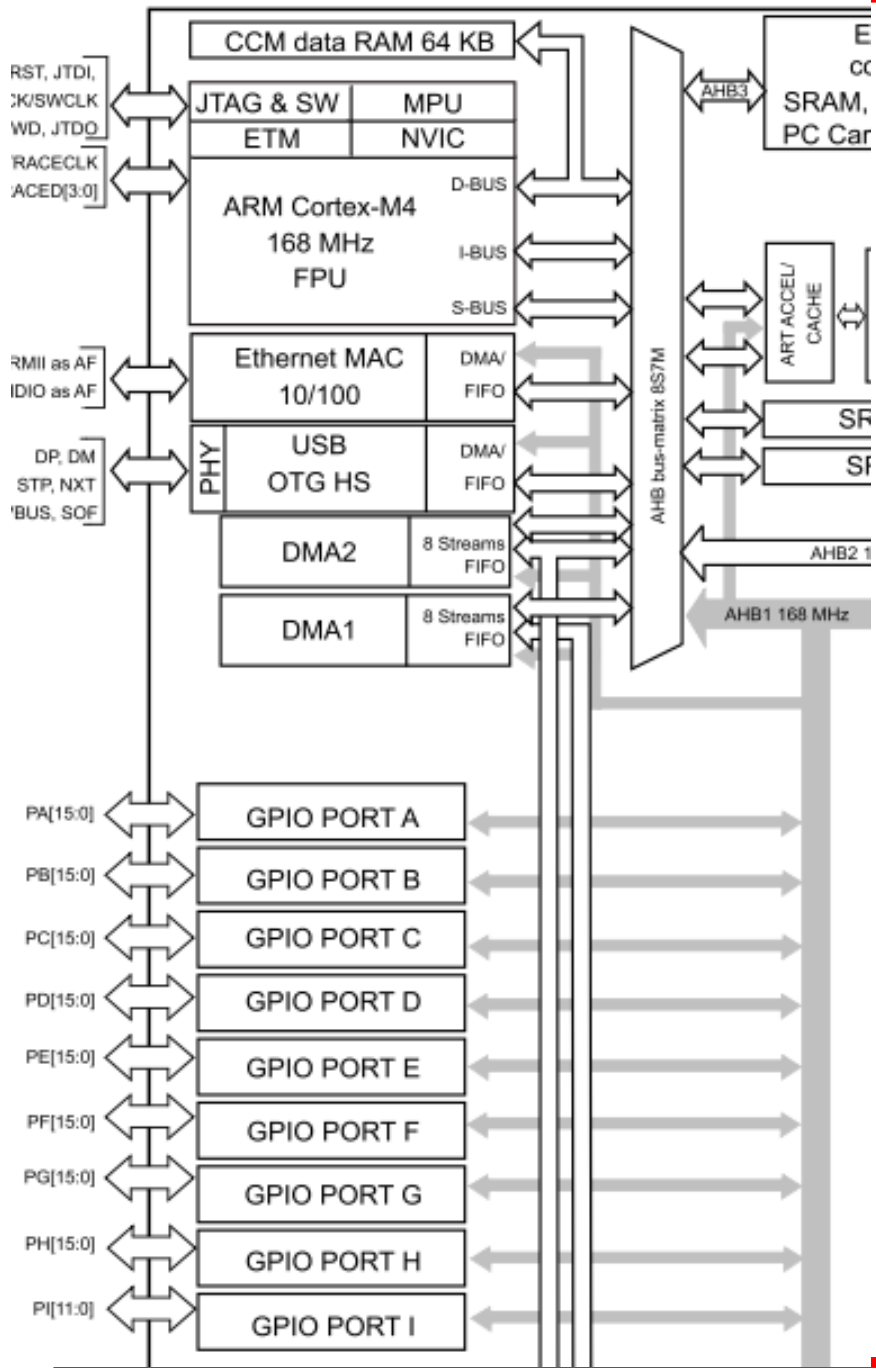
## Memory map

0x4002 3800 - 0x4002 3BFF	RCC
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Reset and Clock Controller (RCC): Sistem ve Çevre birim (peripheral) çevrimlerini (clock) kontrol eder.

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# GPIO Programlama



## RCC AHB1 peripheral clock register (RCC\_AHB1ENR)

Address offset: 0x30

10	9	8	7	6	5	4	3	2	1	0
GPIOK EN	GPIOJ EN	GPIOIE N	GPIOH EN	GPIOG EN	GPIOFE N	GPIOEEN	GPIOD EN	GPIOC EN	GPIOB EN	GPIOA EN
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Bit 3 **GPIODEN**: IO port D clock enable

This bit is set and cleared by software.

0: IO port D clock disabled

1: IO port D clock enabled

Bit 2 **GPIOCEN**: IO port C clock enable

This bit is set and cleared by software.

0: IO port C clock disabled

1: IO port C clock enabled

Bit 1 **GPIOBEN**: IO port B clock enable

This bit is set and cleared by software.

0: IO port B clock disabled

1: IO port B clock enabled

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# GPIO Programlama

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## Memory map

0x4002 1000 - 0x4002 13FF	GPIOE
0x4002 0C00 - 0x4002 0FFF	GIPOD
0x4002 0800 - 0x4002 0BFF	GPIOC
0x4002 0400 - 0x4002 07FF	GPIOB
0x4002 0000 - 0x4002 03FF	GPIOA

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# GPIO Programlama

## GPIO registers

### GPIO port mode register (GPIOx\_MODER) (x = A..I/J/K)

Reset values:

Address offset: 0x00

- 0xA800 0000 for port A
- 0x0000 0280 for port B
- 0x0000 0000 for other ports

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
MODER15[1:0]		MODER14[1:0]		MODER13[1:0]		MODER12[1:0]		MODER11[1:0]		MODER10[1:0]		MODER9[1:0]		MODER8[1:0]	
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MODER7[1:0]		MODER6[1:0]		MODER5[1:0]		MODER4[1:0]		MODER3[1:0]		MODER2[1:0]		MODER1[1:0]		MODER0[1:0]	
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

**MODERy[1:0]:** Port x configuration bits (y = 0..15)

These bits are written by software to configure the I/O direction mode.

00: Input (reset state)

01: General purpose output mode

10: Alternate function mode

11: Analog mode



# GPIO Programlama

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## GPIO registers

### GPIO port input data register (GPIOx\_IDR) (x = A..I/J/K)

Address offset: 0x10

Reset value: 0x0000 XXXX (where X means undefined)

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Reserved															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
IDR15	IDR14	IDR13	IDR12	IDR11	IDR10	IDR9	IDR8	IDR7	IDR6	IDR5	IDR4	IDR3	IDR2	IDR1	IDR0
r	r	r	r	r	r	r	r	r	r	r	r	r	r	r	r

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# GPIO Programlama

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## GPIO registers

### GPIO port output data register (GPIOx\_ODR) (x = A..I/J/K)

Address offset: 0x14

Reset value: 0x0000 0000

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Reserved															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ODR15	ODR14	ODR13	ODR12	ODR11	ODR10	ODR9	ODR8	ODR7	ODR6	ODR5	ODR4	ODR3	ODR2	ODR1	ODR0
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

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