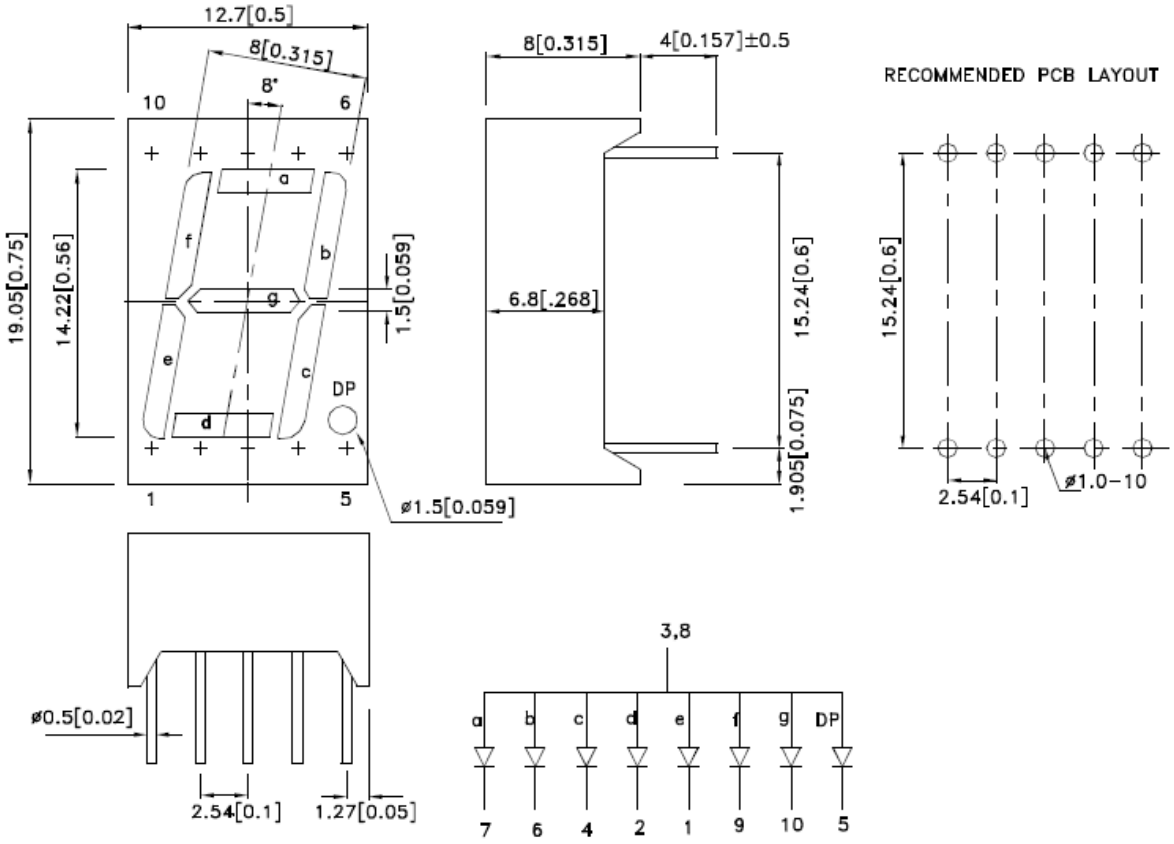
Beágyazott és Érzékelő Alapú Rendszerek
STM32F4 Discovery 4.

A „hardver”

- Hét szegmenses kijelző
- Potenciométer, 100K
- Fotóellenállás

Kingbright SA56-11EWA

- Hány „láb” kell?



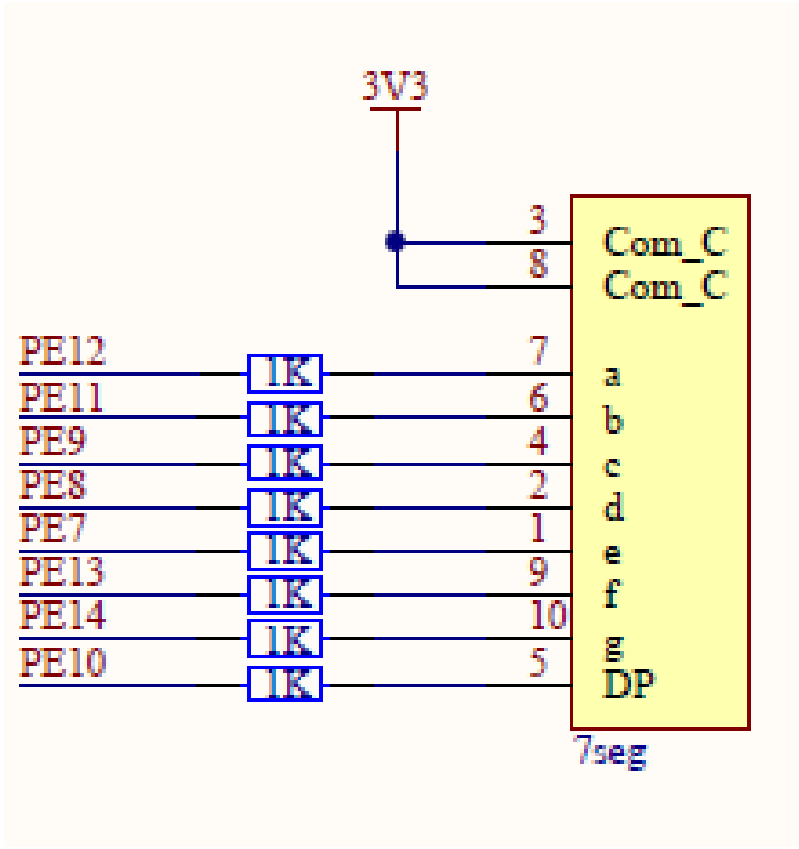
Hova köthetjük?

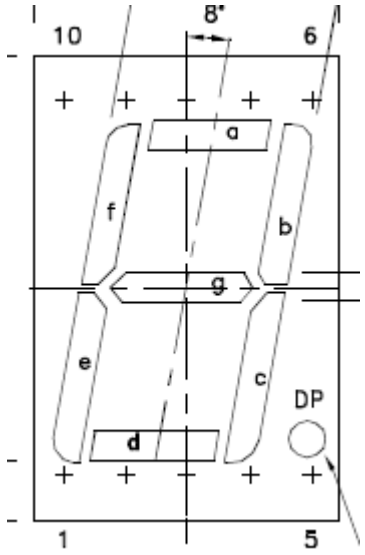
- GPIO
- PE7…14

Table 5. MCU pin description versus board function (page 9 of 10)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PE7	FSMC_D4/ TIM1_ETR	38													25	
PE8	FSMC_D5/ TIM1_CH1N	39													26	
PE9	FSMC_D6/ TIM1_CH1	40													27	
PE10	FSMC_D7/ TIM1_CH2N	41													28	
PE11	FSMC_D8/ TIM1_CH2	42													29	
PE12	FSMC_D9/ TIM1_CH3N	43													30	
PE13	FSMC_D10/ TIM1_CH3	44													31	
PE14	FSMC_D11/ TIM1_CH4	45													32	

Bekötése

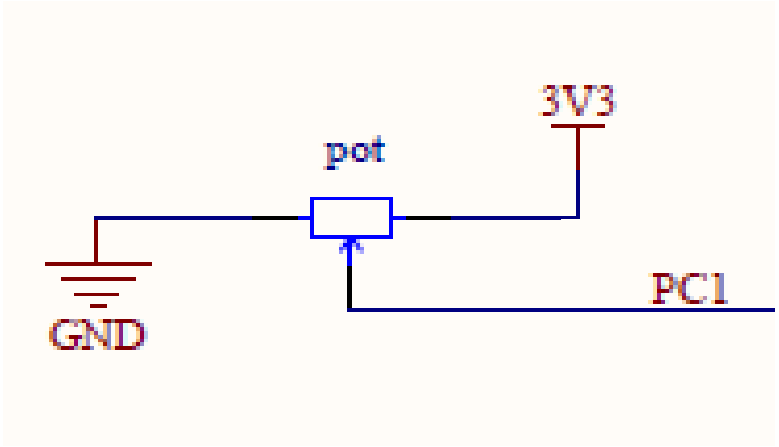

3V3
3
8
Com_C
Com_C
PE12
PE11
PE9
PE8
PE7
PE13
PE14
PE10
1K
1K
1K
1K
1K
1K
1K
1K
7
6
4
2
1
9
10
5
a
b
c
d
e
f
g
DP
7seg


10
8
6
a
f
b
g
e
c
DP
d
1
5

„Poti”

- Hova köthetjük?
  - AIN
  - Pl. PC1

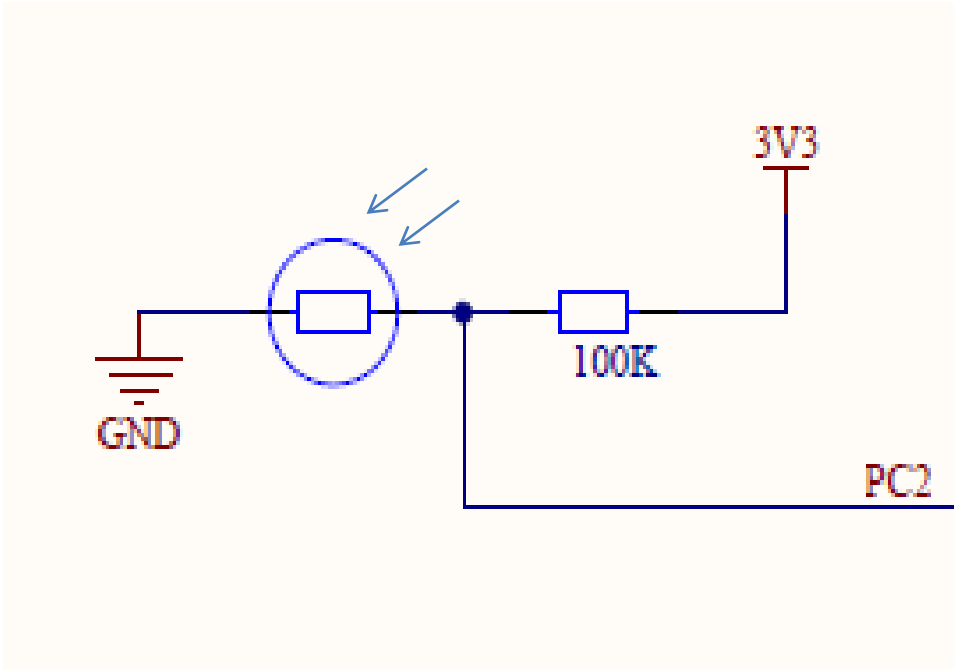
MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PC1	ETH_MDC/ ADC123_IN11	16													7	
PC2	SPI2_MISO/ OTG_HS_ULPI_DIR/ TH_MII_TXD2/ I2S2ext_SD/ ADC123_IN12	17													10	



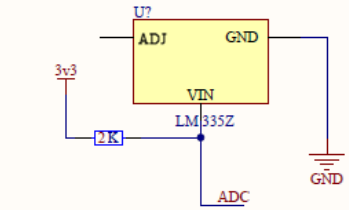
Fotóellenállás

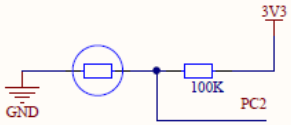
- Hova köthetjük?
  - AIN
  - Pl. PC2

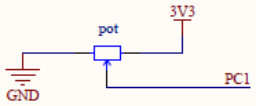
MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PC1	ETH_MDC/ ADC123_IN11	16													7	
PC2	SPI2_MISO/ OTG_HS_ULPI_DIR/ TH_MII_TXD2/ I2S2ext_SD/ ADC123_IN12	17													10	

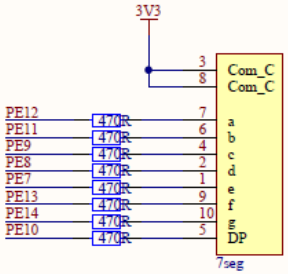


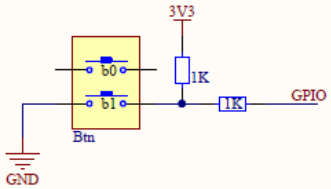
Egyben (2013 ősz)

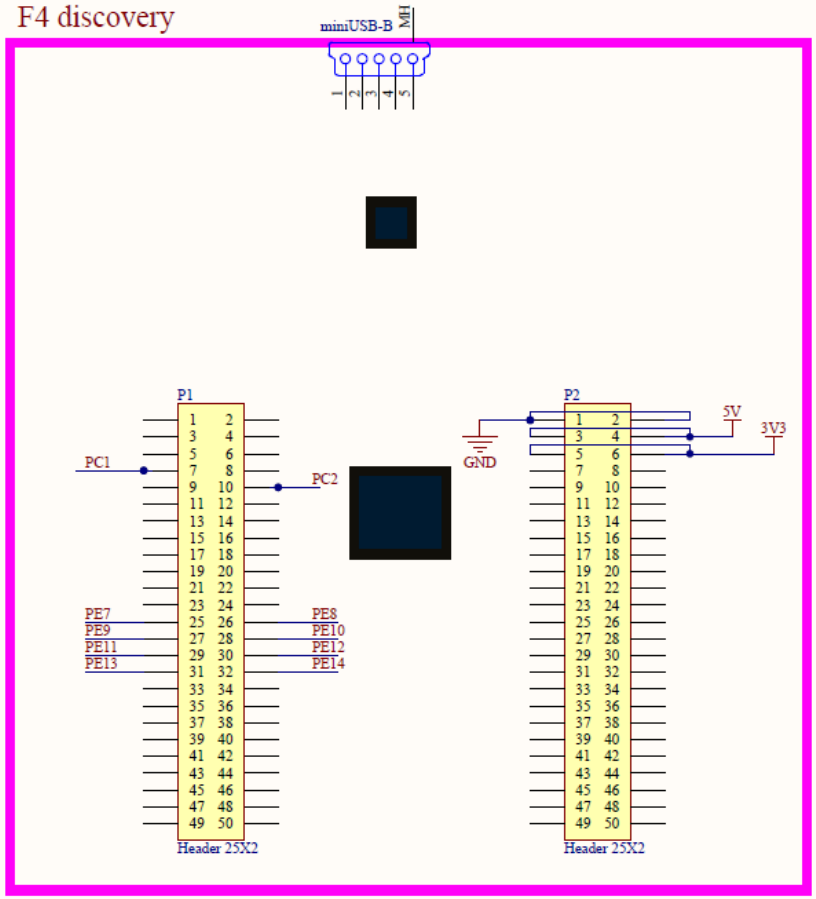












Title		
Size A4	Number	Revision
Date: 2013.12.03.	Sheet of	
File: D:_projekt\..\f4discovery.SchDoc	Drawn By:	

Feladat 1.:

- Poti (PC1) kezelése ADC 12 biten
- Mért értéket 0..4095-ról 0…9 közé konvertálni
- Mért értéket hét szegmenses kijelzőn kiírni
- *Előző órai feladat alapján*

```
void sevenSegment_Init()
{
  GPIO_InitTypeDef  GPIO_InitStructure;

  /* Enable the GPIO_LED Clock */
  RCC_AHB1PeriphClockCmd(RCC_AHB1Periph_GPIOE, ENABLE);

  /* Configure the GPIO_LED pin */
  GPIO_InitStructure.GPIO_Pin = GPIO_Pin_7 | GPIO_Pin_8 |
   GPIO_Pin_9 | GPIO_Pin_10 | GPIO_Pin_11 | GPIO_Pin_12 |
   GPIO_Pin_13 | GPIO_Pin_14;
  GPIO_InitStructure.GPIO_Mode = GPIO_Mode_OUT;
  GPIO_InitStructure.GPIO_OType = GPIO_OType_PP;
  GPIO_InitStructure.GPIO_PuPd = GPIO_PuPd_UP;
  GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;
  GPIO_Init(GPIOE, &GPIO_InitStructure);
}
```

Szegmensek kezelése

```
/* High all - Turn Off */
  GPIOE->BSRRL = GPIO_Pin_7 | GPIO_Pin_8 |
  GPIO_Pin_9 | GPIO_Pin_10 | GPIO_Pin_11 |
  GPIO_Pin_12 | GPIO_Pin_13 | GPIO_Pin_14;

/* Low to all - Turn On */
  GPIOE->BSRRH = GPIO_Pin_7 | GPIO_Pin_8 |
  GPIO_Pin_9 | GPIO_Pin_10 | GPIO_Pin_11 |
  GPIO_Pin_12 | GPIO_Pin_13 | GPIO_Pin_14;
```

BSRR L/H

6.4.7 GPIO port bit set/reset register (GPIOx_BSRR) (x = A..I)

Address offset: 0x18

Reset value: 0x0000 0000

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
BR15	BR14	BR13	BR12	BR11	BR10	BR9	BR8	BR7	BR6	BR5	BR4	BR3	BR2	BR1	BR0
w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BS15	BS14	BS13	BS12	BS11	BS10	BS9	BS8	BS7	BS6	BS5	BS4	BS3	BS2	BS1	BS0
w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w

Bits 31:16 **BRy:** Port x reset bit y (y = 0..15)

These bits are write-only and can be accessed in word, half-word or byte mode. A read to these bits returns the value 0x0000.

0: No action on the corresponding ODRx bit

1: Resets the corresponding ODRx bit

Note: If both BSx and BRx are set, BSx has priority.

Bits 15:0 **BSy:** Port x set bit y (y= 0..15)

These bits are write-only and can be accessed in word, half-word or byte mode. A read to these bits returns the value 0x0000.

0: No action on the corresponding ODRx bit

1: Sets the corresponding ODRx bit

RM0090

Reference manual

STM32F405xx, STM32F407xx, STM32F415xx and STM32F417xx advanced ARM-based 32-bit MCUs

Pl. „0”

```
switch(number){
 case 0:
  /*High to all - Turn Off*/
  GPIOE->BSRRL = GPIO_Pin_14 | GPIO_Pin_10;
  /*Low to all - Turn On*/
  GPIOE->BSRRH = GPIO_Pin_7 | GPIO_Pin_8 | GPIO_Pin_9  |
   GPIO_Pin_11 | GPIO_Pin_12 | GPIO_Pin_13 ;
 break;
```

stb…

Default: „DP” – decimal point

```
int main(void)
{
  ADC3_CH11_DMA_Config();
  ADC_SoftwareStartConv(ADC3);
  sevenSegment_Init();

  while (1)
  {
    setSegments((ADC3ConvertedValue) * 9 /
  0xFFF);
  }
```