

Masking

e-Yantra Team

Embedded Real-Time Systems (ERTS) Lab
Indian Institute of Technology, Bombay



Agenda for Discussion

1 Masking

- What is Masking
- Examples



What is Masking



What is Masking

- ✓ Masking in basic terms is hiding.



What is Masking

- ✓ Masking in basic terms is hiding.
- ✓ Sometimes, we need to change the state of only one pin of the port thereby keeping the rest of the pins unchanged.



What is Masking

- ✓ Masking in basic terms is hiding.
- ✓ Sometimes, we need to change the state of only one pin of the port thereby keeping the rest of the pins unchanged.
- ✓ The Masking can be attained by using AND operator and OR operator.



What is Masking

- ✓ Masking in basic terms is hiding.
- ✓ Sometimes, we need to change the state of only one pin of the port thereby keeping the rest of the pins unchanged.
- ✓ The Masking can be attained by using AND operator and OR operator.
- ✓ Whenever we want to SET a particular bit we use OR operator.



What is Masking

- ✓ Masking in basic terms is hiding.
- ✓ Sometimes, we need to change the state of only one pin of the port thereby keeping the rest of the pins unchanged.
- ✓ The Masking can be attained by using AND operator and OR operator.
- ✓ Whenever we want to SET a particular bit we use OR operator.
- ✓ Whenever we want to RESET a bit we use AND operator



Examples of Masking



Examples of Masking

- ① Example: Setting a bit :



Examples of Masking

① Example: Setting a bit :

- a. PORT B has data 0x83 (unknown to us). We want to set PB2 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1



Examples of Masking

① Example: Setting a bit :

- a. PORT B has data 0x83 (unknown to us). We want to set PB2 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1



Examples of Masking

1 Example: Setting a bit :

- a. PORT B has data 0x83 (unknown to us). We want to set PB2 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	1	1	1



Examples of Masking

1 Example: Setting a bit :

- a. PORT B has data 0x83 (unknown to us). We want to set PB2 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	1	1	1



Examples of Masking

1 Example: Setting a bit :

- a. PORT B has data 0x83 (unknown to us). We want to set PB2 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	1	1	1



Examples of Masking



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1

OR

D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	0	1	0	0



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	1	1

OR

D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	0	1	0	0

① `PORTB = PORTB | 0x04;`



Examples of Masking



Examples of Masking

- ① Example: Resetting a bit :



Examples of Masking

① Example: Resetting a bit :

- a. PORT B has data 0x53 (unknown to us). We want to reset PB4 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1



Examples of Masking

① Example: Resetting a bit :

- a. PORT B has data 0x53 (unknown to us). We want to reset PB4 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1



Examples of Masking

1 Example: Resetting a bit :

- a. PORT B has data 0x53 (unknown to us). We want to reset PB4 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	0	0	0	1	1



Examples of Masking

1 Example: Resetting a bit :

- a. PORT B has data 0x53 (unknown to us). We want to reset PB4 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	0	0	0	1	1



Examples of Masking

1 Example: Resetting a bit :

- a. PORT B has data 0x53 (unknown to us). We want to reset PB4 and keep rest of the data intact.

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1

- b. Expected output is:

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	0	0	0	1	1



Examples of Masking



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1

AND

D7	D6	D5	D4	D3	D2	D1	D0
1	1	1	0	1	1	1	1



Examples of Masking

D7	D6	D5	D4	D3	D2	D1	D0
0	1	0	1	0	0	1	1

AND

D7	D6	D5	D4	D3	D2	D1	D0
1	1	1	0	1	1	1	1

① `PORTB = PORTB & 0xEF;`



Thank You!

Post your queries on: support@e-yantra.org

