



# EM652x Microcontroller

## Demo Board Manual

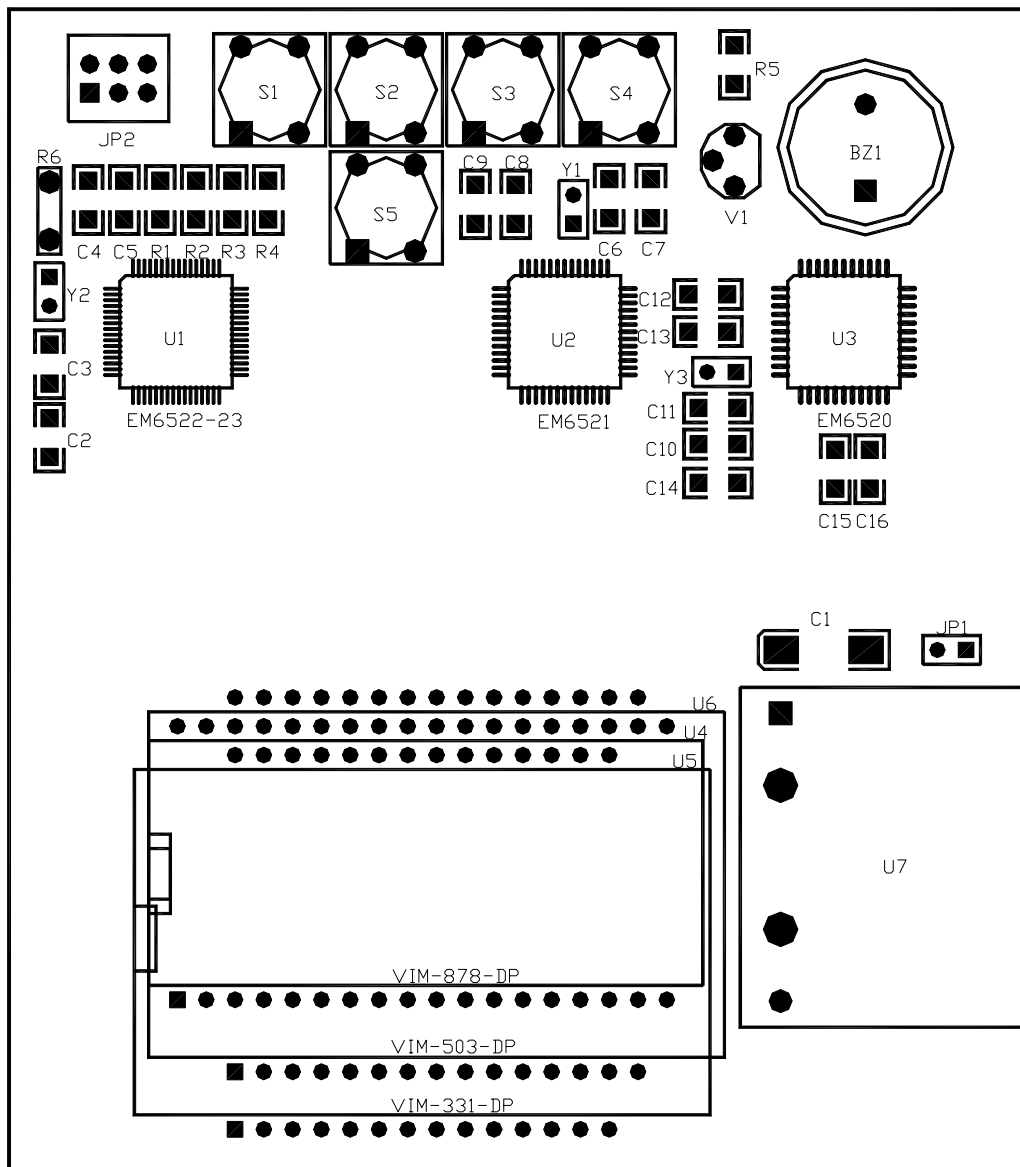
- Description's manual of the 652x demo board
- Softwares

## 1. Demo MFP Microcontroller EM652x

### 1.1. Description

The demo board EM652x gives the opportunity to run your own code. It has a LCD display directly connected to the chip, a buzzer, a reset button and four buttons on PortA. No power supply is needed, a battery is implemented. The six-pin connector is used to program the chip from the programming box EM65xx.

### 1.2. Implementation of the board





# Demoboard EM652x

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### 1.3. Be careful the board has to be configured in different way depending on which microcontroller it will be used.

No possibility to switch from one type of microcontroller to the other.

### 1.4. Equipment needs

This board does not have serial port transmission. It means, to be able to download a program you need to have an EM programming box, with our own software development system.

### 1.5. Components used

- 1 microcontroller EM652x
- 1 quartz 32kHz
- 1 battery of 3V
- 1 LCD
- 1 buzzer used for EM6521 and EM6522
- 1 RESET button ( S5 )
- 4 buttons on PortA 0 to 3 ( S4, S3, S2, S1 ) => (P1, P2, P3, P4) in software application
- 4 pull down resistors on PortA
- 1 programming connector

On JP1, an ampermeter can be connected to measure the total consumption of the demo board.

The capacitor ( C1 ) is in parallel to the battery. This gives the opportunity to detect, during a longer time, the voltage levels ( SVLD ) when the battery is disconnected.

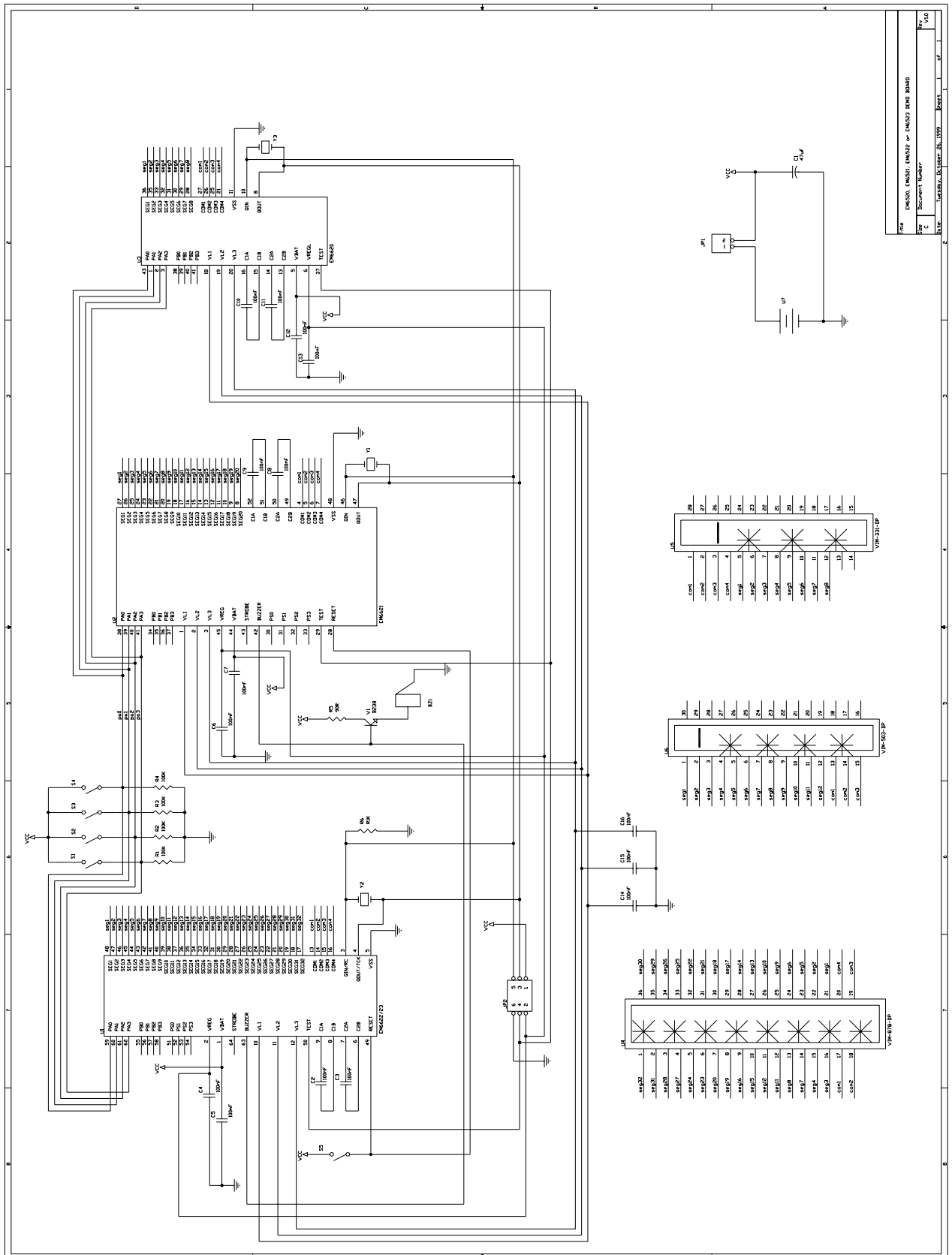
The microcontroller EM6520 is implemented with the LCD VIM-331-DP ( 4 COM and 8 Segments )

The microcontroller EM6521 is implemented with the LCD VIM-503-DP ( 3 COM and 12 Segments )

The microcontroller EM6522 is implemented with the LCD VIM-878-DP ( 4 COM and 32 Segments )

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## 1.6. Schematic



Rev	EM652X DEMO BOARD - EM652X DEMO BOARD	Rev
1.0	Document Number	1.0
1.1	1.1	1.1
1.2	1.2	1.2
1.3	1.3	1.3
1.4	1.4	1.4
1.5	1.5	1.5
1.6	1.6	1.6
1.7	1.7	1.7
1.8	1.8	1.8
1.9	1.9	1.9
2.0	2.0	2.0
2.1	2.1	2.1
2.2	2.2	2.2
2.3	2.3	2.3
2.4	2.4	2.4
2.5	2.5	2.5
2.6	2.6	2.6
2.7	2.7	2.7
2.8	2.8	2.8
2.9	2.9	2.9
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3.2	3.2	3.2
3.3	3.3	3.3
3.4	3.4	3.4
3.5	3.5	3.5
3.6	3.6	3.6
3.7	3.7	3.7
3.8	3.8	3.8
3.9	3.9	3.9
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5.2	5.2	5.2
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5.4	5.4	5.4
5.5	5.5	5.5
5.6	5.6	5.6
5.7	5.7	5.7
5.8	5.8	5.8
5.9	5.9	5.9
6.0	6.0	6.0
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6.7	6.7	6.7
6.8	6.8	6.8
6.9	6.9	6.9
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7.5	7.5	7.5
7.6	7.6	7.6
7.7	7.7	7.7
7.8	7.8	7.8
7.9	7.9	7.9
8.0	8.0	8.0
8.1	8.1	8.1
8.2	8.2	8.2
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8.5	8.5	8.5
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8.7	8.7	8.7
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8.9	8.9	8.9
9.0	9.0	9.0
9.1	9.1	9.1
9.2	9.2	9.2
9.3	9.3	9.3
9.4	9.4	9.4
9.5	9.5	9.5
9.6	9.6	9.6
9.7	9.7	9.7
9.8	9.8	9.8
9.9	9.9	9.9
10.0	10.0	10.0



## Application Note

Product: **4 bits Microcontroller**  
Subject: **- Clock with chronometer**  
Date: October 08, 1999  
Keywords: **4-bit micro-controller, LCD VIM-331-DP, demo board**

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## User manual Clock / Chronometer

- 1. CHANGE THE MODE** Press P2 to change the mode (time/chrono).  
"Local time" displayed on the LCD.  
Press 1x to display the chronometer.  
Press 2x to return to the clock.
- 2. LOCAL TIME** 🕒  
Press P2 to active the mode "Local Time".  
Hold P1 to display the seconds.
- 3. SET TIME** 🕒  
Press P2 to active the mode "Local Time".  
Hold P3 until the hour blinks.  
Press P4 to increment the hours.  
Press P3, the minutes are blinking.  
Press P4 to increment the minutes.  
Press P3, to start the time.  
If you don't increment the time, the clock doesn't stop, if you do, the seconds are reset to 00.
- 4. CHRONOMETER**  
Press P2 to active the mode "Chronometer".  
Press P4 to start and stop the chronometer.  
Hold P1 to display the milliseconds.  
Press P3 to reset the chronometer (in start or stop mode).

Remark: - If you return in the clock mode with P2, the chronometer doesn't stop.  
To stop and read the chrono result, you must return in "chronometer mode".  
- When the battery is lower than 2 V, the battery sign is displayed.

For more information and demo programs:

E-mail: [micro@emmarin.ch](mailto:micro@emmarin.ch)  
Web Site: [www.emmarin.com](http://www.emmarin.com)



## Application Note

Product: **4 bits Microcontroller**  
Subject: **- Mastermind**  
Date: October 14, 1999  
Keywords: **4-bit micro-controller, LCD VIM-503-DP, demo board**

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## User manual Mastermind

### 1. START GAME

The LCD is blank.

Press P4 to start the game.

The LCD display "0000".

A random number of four digits are generated. The goal is to find this number.

### 2. WRITE A NUMBER

Press P1 to increment the value.

Press P2 to decrement the value.

Press P3 to access to the next value.

After the 4<sup>th</sup> digit, you heard a sound and read on the LCD two digit. The one on the left indicates the number of digit who is present in the number to discover. The other digit indicates the number of digit at the right place.

Press P4 to choose an another value.

If it's the right value, you see the value and the number of choice blinking, and you are listen music.

Press reset to stop the music and restart a new game.

For more information and demo programs:

E-mail: [micro@emmarin.ch](mailto:micro@emmarin.ch)

Web Site: [www.emmarin.com](http://www.emmarin.com)



## Application Note

Product: **4 bits Microcontroller**  
Subject: **- Count Down**

Date: April 12, 2000

Keywords: **4-bits microcontroller, LCD VIM-878-DP**

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## User manual Count Down.

### 1. MODE

#### 1.1 CHANGE THE MODE ( count down disable)

Press P1 for changes the mode.

“Local time” display on the LCD.

Press 1x for display1 the date.

Press 2x for displays the alarm.

Press 3x for displays the count down.

Press 4x for return at the local time.

If you don't press a touch after 15 sec., the display returns at the local time.

#### 1.2 CHANGE THE MODE (count down enable)

Press P1 for changes the mode.

“Count Down” display on the LCD.

Press 1x for displays the local time.

Press 2x for displays the date.

Press 3x for displays the alarm.

Press 4x for return at the count down.

If you don't press a touch after 15 sec., the display returns at the count down.

### 2. LOCAL TIME 🕒

Press P1 for active the mode “Local Time”.

Press P2 until the hour blink.

Press P1 for increment the hours.

Press P2, the minute blink.

Press P1 for increment the minutes.

Press P2, the time start.

If you don't increment the time, then the clock don't stop, else the second is reset to 00.



### 3. DATE

Press P1 for active the mode "Date".  
Press P2 until the name of day's blink.  
Press P1 for increment the name of days.  
Press P2, the days blink.  
Press P1 for increment the days.  
Press P2, the months blink.  
Press P1 for increment the months.  
Press P2, the years blink.  
Press P1 for increment the years.  
Press P2 for valid the new date.  
You can valid the new date only if it's correct.

Remark: - the calculate for the bisextil years and the count down is automatic.  
- the name of days is independent of the date.

### 4. ALARM

Press P1 for active the mode "Alarm".  
Press P2 until the hour blink.  
Press P1 for increment the hours.  
Press P2, the minute blink.  
Press P1 for increment the minutes.  
Press P2 for valid the new time of the alarm.

Remark: - on every modification, the alarm is disable or enable automatically.  
- a clock is displayed on the LCD for the alarm enable.

### 5. COUNT DOWN

Press P1 for active the mode "Count Down".  
Press P2 until the day blink.  
Press P1 for increment the day.  
Press P2, the months blink.  
Press P1 for increment the months.  
Press P2, the years blink.  
Press P1 for increment the years.  
Press P2 for valid the new date for the count down.