

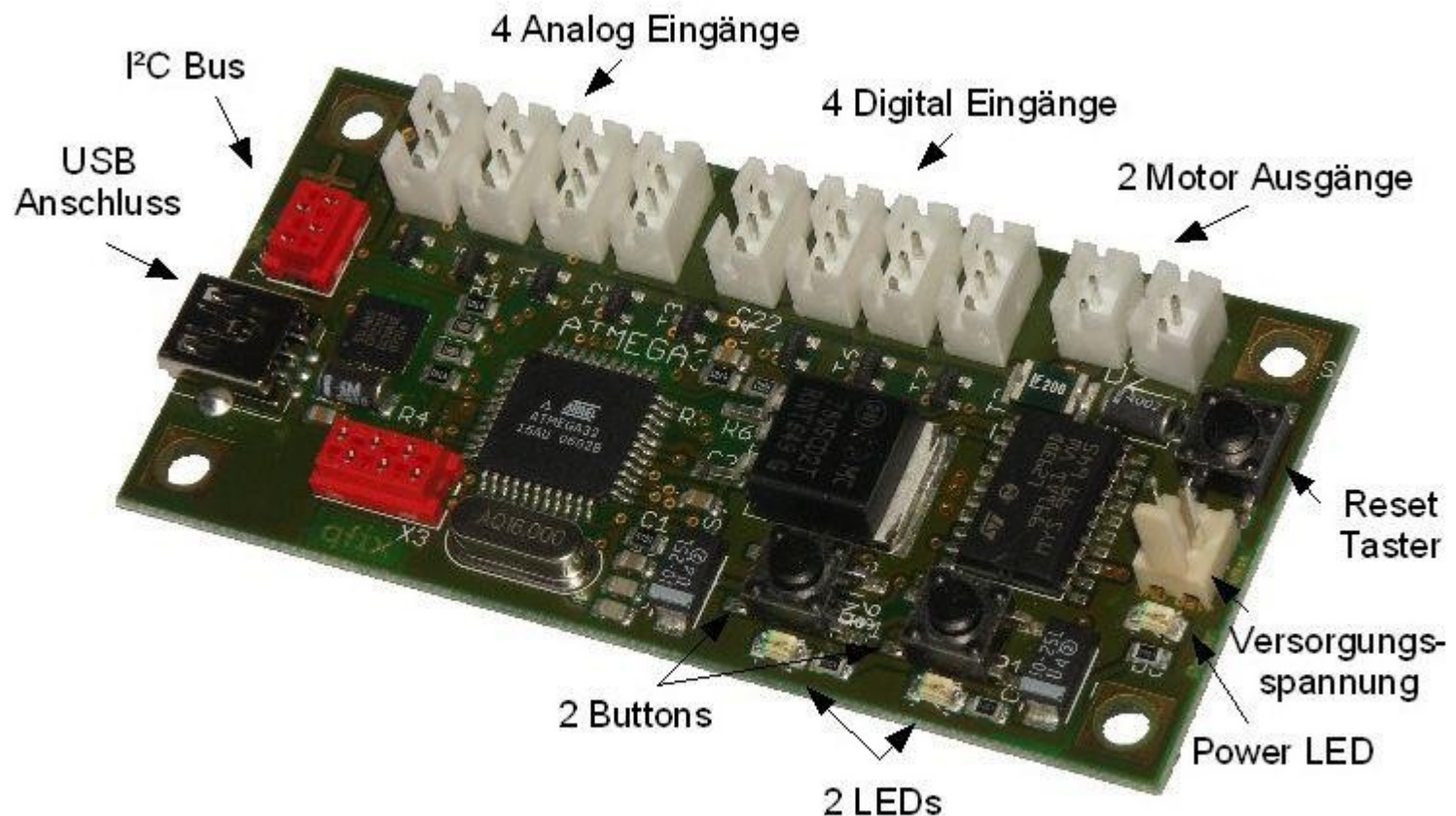
Programmieren von Mikrocontrollersystemen

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2. Erste Schritte

Controllerboard

- "MiniBoard":



C++

- C entstand ca. 1970
durch Dennis Ritchie, Bell Labs
- C++ entstand ca. 1980
durch Bjarne Stroustrup, AT&T
- Erweiterung von C um Objektorientierung

Grundprogramm

```
#include "qfixMiniBoard.h"
```

```
MiniBoard board;
```

```
int main()
```

```
{
```



Hier steht nachher
das Programm

```
}
```

Aufgabe: LED anschalten

Die LED 1 soll angeschaltet werden.

Lösung: LED anschalten

```
#include "qfixMiniBoard.h"
```

```
MiniBoard board;
```

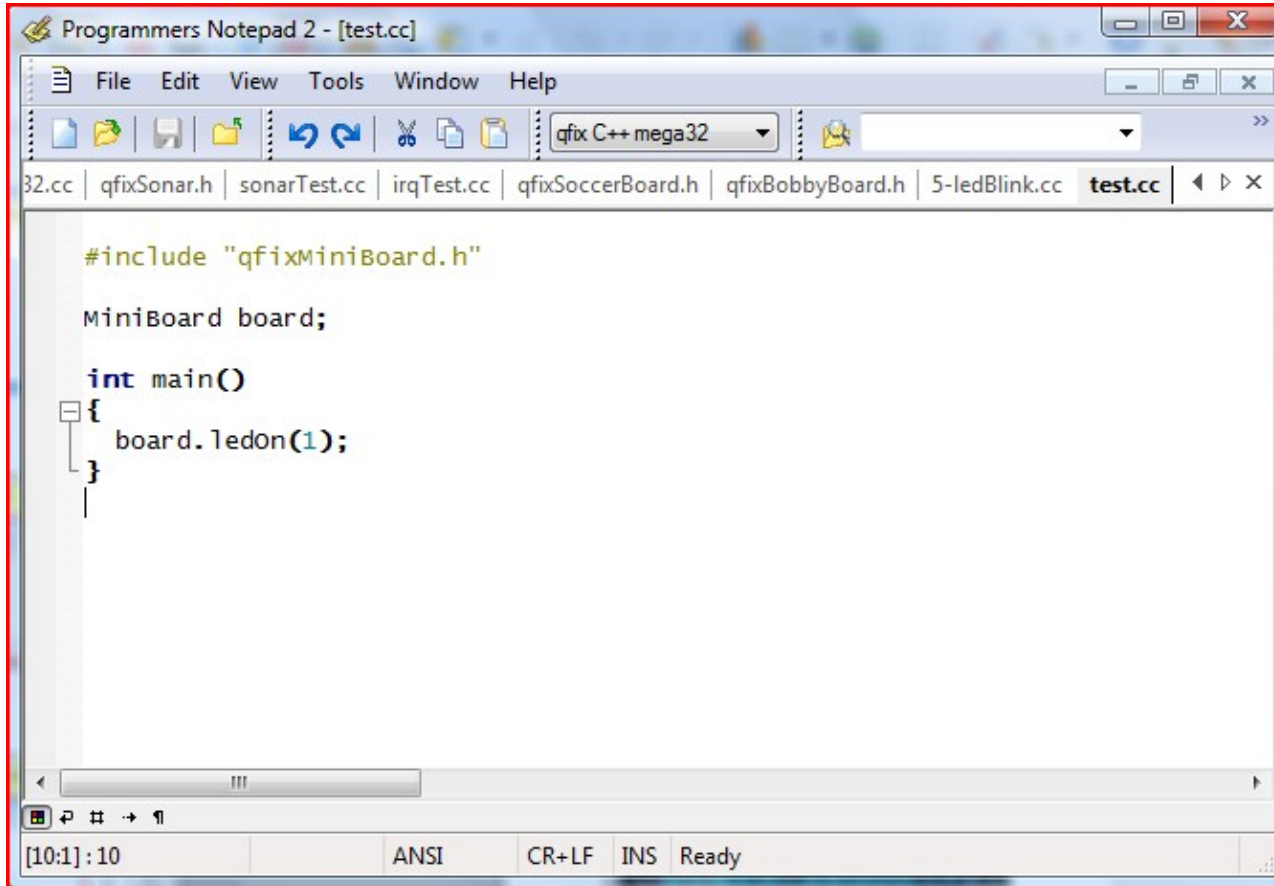
```
int main()
```

```
{
```

```
    board.ledOn(1);
```

```
}
```

Editieren



The screenshot shows a window titled "Programmers Notepad 2 - [test.cc]". The menu bar includes File, Edit, View, Tools, Window, and Help. The toolbar contains icons for file operations and editing. The text area contains the following C++ code:

```
#include "qfixMiniBoard.h"

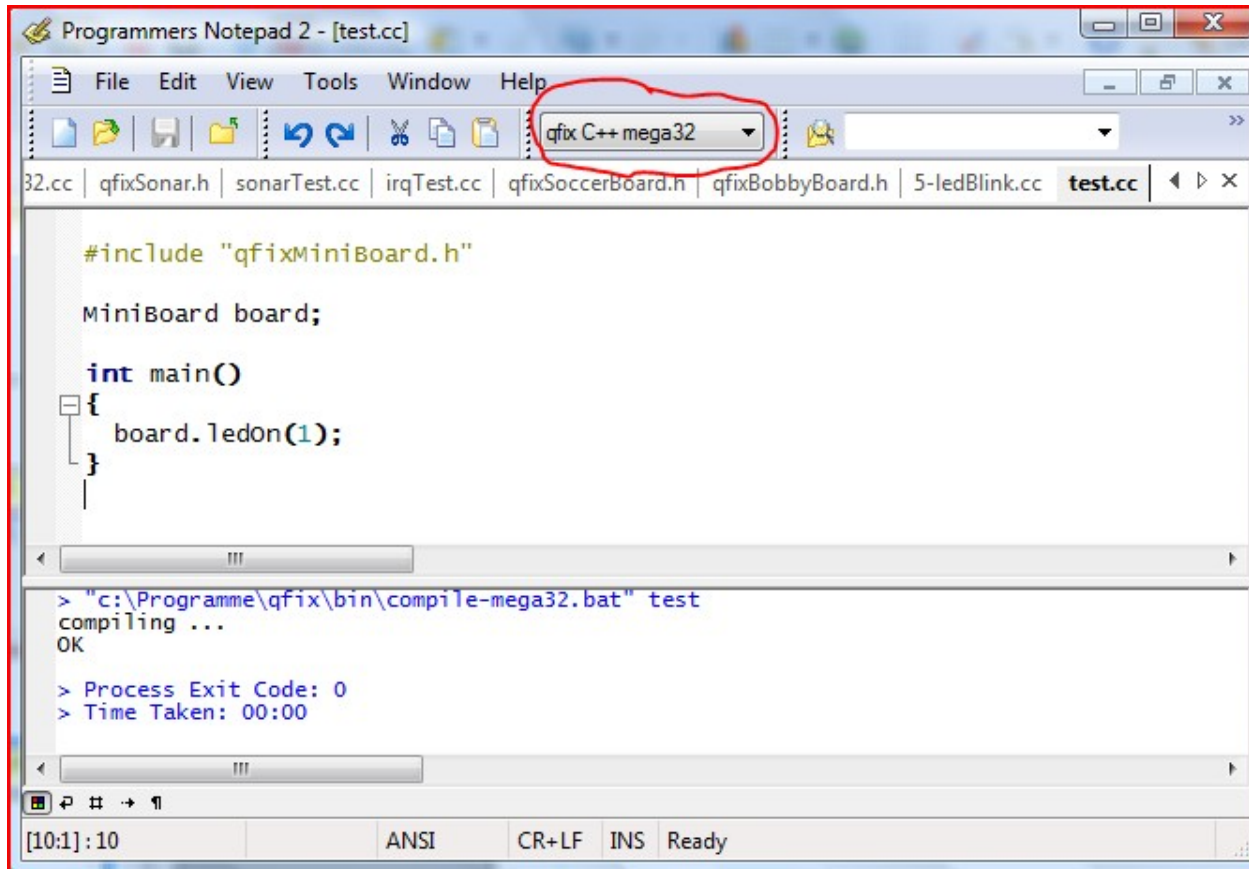
MiniBoard board;

int main()
{
    board.ledon(1);
}
```

The status bar at the bottom indicates the cursor is at line 10, column 10, with settings for ANSI, CR+LF, and INS mode.

- Groß/Klein-schreibung beachten!

Compilieren (F5)



The screenshot shows a Notepad++ window titled "Programmers Notepad 2 - [test.cc]". The menu bar includes File, Edit, View, Tools, Window, and Help. The toolbar contains various icons, and a dropdown menu is open, showing "qfix C++ mega32" selected. The code editor contains the following C++ code:

```
#include "qfixMiniBoard.h"

MiniBoard board;

int main()
{
    board.ledOn(1);
}
```

Below the code editor is a terminal window showing the output of a compilation command:

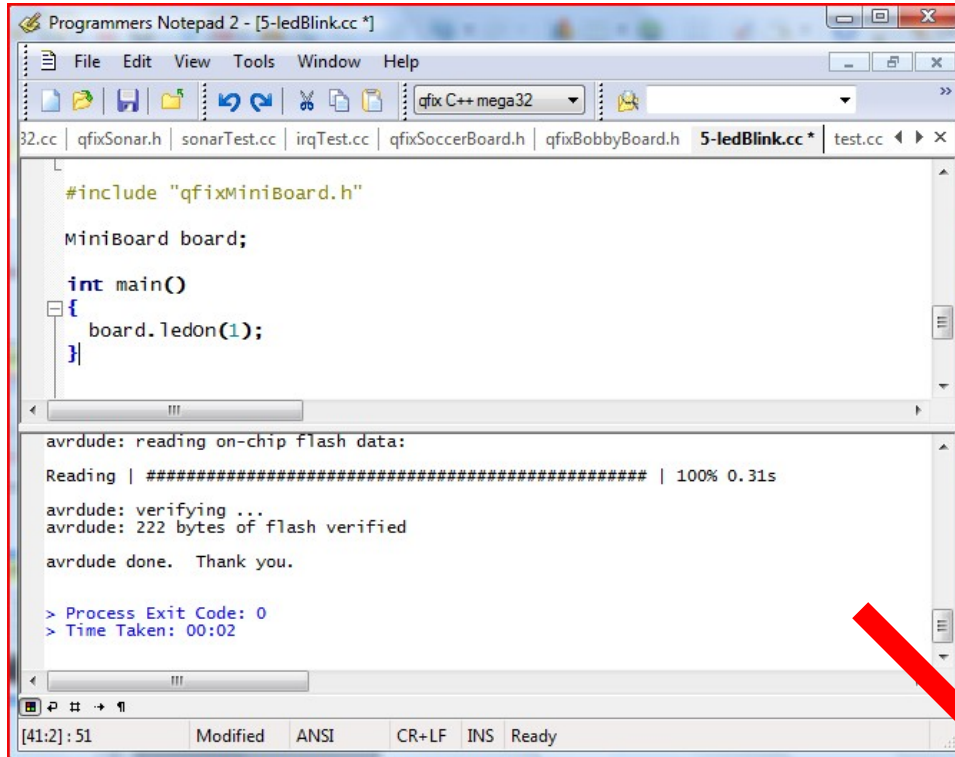
```
> "c:\Programme\qfix\bin\compile-mega32.bat" test
compiling ...
OK

> Process Exit Code: 0
> Time Taken: 00:00
```

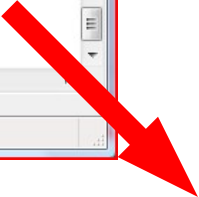
The status bar at the bottom shows the cursor position [10:1]:10, the encoding ANSI, and the keyboard layout CR+LF INS Ready.

- Controller prüfen
- Speichern (Strg+S)
- **F5 drücken**
- Output prüfen

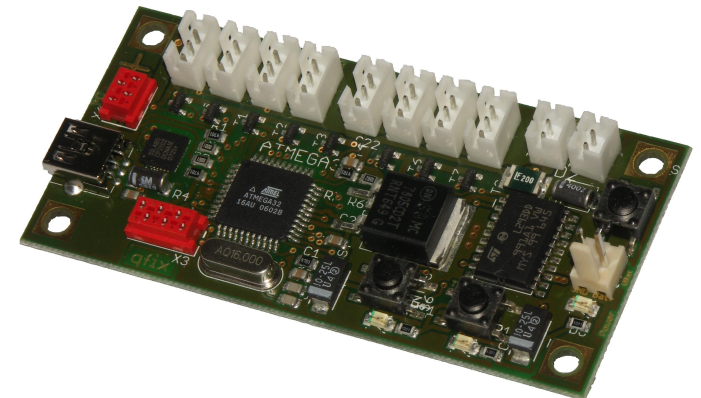
Übertragen (F6)



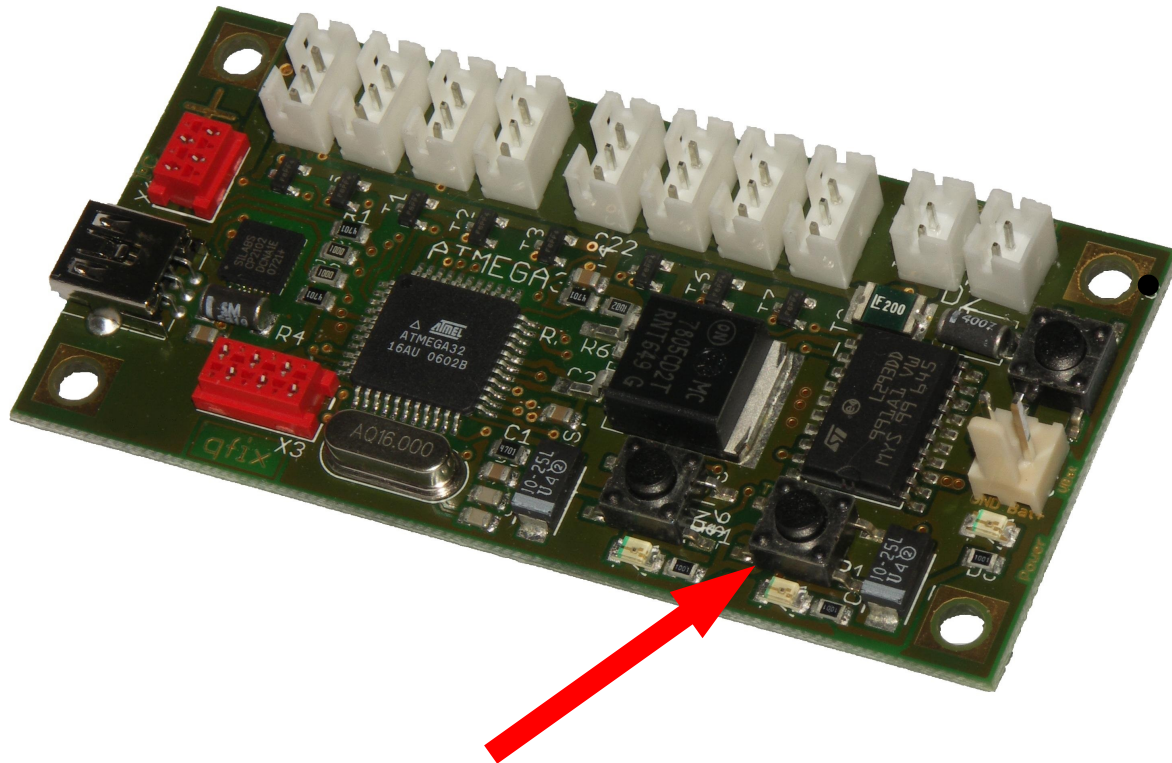
```
Programmers Notepad 2 - [5-ledBlink.cc *]  
File Edit View Tools Window Help  
qfix C++ mega32  
32.cc | qfixSonar.h | sonarTest.cc | irqTest.cc | qfixSoccerBoard.h | qfixBobbyBoard.h | 5-ledBlink.cc * | test.cc  
#include "qfixMiniBoard.h"  
MiniBoard board;  
int main()  
{  
    board.ledon(1);  
}  
avrdude: reading on-chip flash data:  
Reading | ##### | 100% 0.31s  
avrdude: verifying ...  
avrdude: 222 bytes of flash verified  
avrdude done. Thank you.  
> Process Exit Code: 0  
> Time Taken: 00:02  
[41:2]: 51 Modified ANSI CR+LF INS Ready
```



- USB Kabel anstecken
- **Reset drücken**
- **F6 drücken**
- Output prüfen



Ausführen



- (Evtl. USB-Kabel abziehen)
- **Startknopf drücken**