

Re: universal programmer

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2005-12/msg04447.html>

- *From:* "Jack W." <jackw@xxxxxxxxxx>
 - *Date:* Mon, 26 Dec 2005 07:39:07 -0500
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"Abstract Dissonance" <Abstract.Dissonance@hotmail.com> wrote in message news:11qrmkj4uu181bc@xxxxxxxxxxxxxxxxxxxxxxxx

>

> "J. David" <jdavid@xxxxxxx> wrote in message

> [news:OIfrf.109779\\$dd6.1481029@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:OIfrf.109779$dd6.1481029@xxxxxxxxxxxxxxxxxxxxxxxx)

>>

>> "Abstract Dissonance" <Abstract.Dissonance@hotmail.com> wrote in message

>> news:11qoqhlquql4kd3@xxxxxxxxxxxxxxxxxxxxxxxx

>>> Since I'm trying to get into MCU it seems I will need a programmer to

>>> get anywhere. From looking online it seems that any "decent" programmer

>>> is pretty expensive(1k+) and those that are cheap seem to offer very few

>>> features and few chip support.

>>>

>>> I was thinking that it shouldn't be very difficult to program just about

>>> any chip by using a computer if the computer had "access" to all the

>>> pins on the chip. From looking at a few data sheets it seems that its

>>> very easy to program a MCU by simply handling the procedure through the

>>> software.

>>>

>>> heres a quote of how to program the PIC16C84

>>>

>>> The device is placed into a program/verify mode by

>>> holding the RB6 and RB7 pins low, while raising the

>>> MCLR pin from VIL to VIH (see PIC16C84 EEPROM

>>> Memory Programming Specification (DS30189)). RB6

>>> becomes the programming clock and RB7 becomes

>>> the programming data. Both RB6 and RB7 are Schmitt

>>> Trigger inputs in this mode.

>>> After reset, to place the device into programming/verify

>>> mode, the program counter (PC) points to location 00h.

>>> A 6-bit command is then supplied to the device, 14-bits

>>> of program data is then supplied to or from the device,

>>> using load or read-type instructions. For complete

>>> details of serial programming, please refer to the In-Circuit

>>> Serial Programming Guide (DS30277).

>>> For ROM devices, both the program memory and Data

>>> EEPROM memory may be read, but only the Data

>>> EEPROM memory may be programmed.

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>>>
>>> It seems to me that if most chips follow a very similar method where you
>>> use a few pins(lets say arbitrary too) to get it into program mode and a
>>> serial communication on one pin to transfer the code then it would be
>>> extremely easy to program any of those chips by using a computer(with
>>> just about any number of pins). Is this the actual case?
>>>
>>> Lets suppose I have a device that simply lets me access any of the pins
>>> on a chip from software.... could I then not use the software to program
>>> the chip? If so, is this true of pretty much most of the MCU's and
>>> EEPROMS or just a few? If not, what are the reasons why I couldn't do
>>> this?
>>>
>>> Only thing I can think of that could prevent it from being so easy is
>>> supplying the proper voltage to the right pin(but this shouldn't be that
>>> hard) and getting the right clock into the chip. Other things like
>>> having ot have resistors and stuff on certain pins for certain reasons
>>> and such would surely scew this method up as then it might become to
>>> complicated to do(well, it would be just easier to buy a "universal
>>> programmer"). If there are no resistors needed and I can generate the
>>> clock from the software in a computer and potentially the voltage(or
>>> just allow the voltage to be selectable by the hardware and on what pin
>>> it should be on) then I can't see why this would be that difficult.
>>> Definately would be much cheaper to do than buying a 1000\$ programmer.
>>>
>>> Is it safe to say that the generalization of the above procedure for the
>>> PIC16C84 applies to almost all other MCU's? And what about those MCU's
>>> that cannot be programmed in that way, what makes them so different?
>>>
>>> Any ideas?
>>>
>>> Thanks,
>>> AD
>>
>> For myself, using microcontrollers in DIP packages (no SMD) from 8 to 40
>> pins, I use a 40-pin ZIF socket (where the uC to be programmed is
>> inserted) and also a small 50-pin connector which can be a DB-50.
>> The first 40 pins of this connector are connected directly to the ZIF
>> socket pins and five other pins are connected to the programmer well
>> known signals, that are: MCLR (or Vpp), Vcc, ground, DATA and CLOCK.
>> These five signals are then hardware-strapped to the appropriate first
>> 40-pins onto a 50-pin plug that fits into the connector for the
>> appropriate uC to be programmed (many share the same programming
>> pinouts).
>> If different uC with a new programming pinout is released, I just buy a
>> new 50-pin plug and hardware-strap it for the new pinouts, that's all!
>> Take a few minutes and soldering iron.
>> So far, I could have coped with the many different programming pinouts
>> Microchip (and others) have conceived to make our lives more difficult to
>> program their chips :)

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>>
>> Johnny
>>
>
> But wouldn't it be nice to have a ZIF socket on your programmer that
> supports 100 pins? ;) Surely the complexity to handle 10 pins or 1000
> pins is virtually the same... most of those pins are useless and don't
> need to be messed with? If so then if one could "rearrange" the pins so
> that only the ones needed are put at the top then its like just having a
> 10 pins or so(or whatever you want) and one wouldn't need to actually
> handle all those useless pins.
>
> Thats my dream though. I figure that would could have some software code
> that looks like this:
>
> out Pin3, 1
> out Pin13, 0
> serial_out(Pin19, bufffer)
>
> while some other chip might be
>
> out Pin1, 1
> out Pin2, 0
> out Pin8, 1
> serial_out(Pin73, bufffer)
>
> (hypothetically... it would be more complicated than this but just to give
> an idea)
>
>
> But the problem is having "access" to all those pins... one needs a sorta
> router to route the pins used to the actual pins on the chip... I'm not
> sure if this is all that difficult or not... maybe the real issues just
> lie in the pratical side of things where certain chips have different
> characteristic like different voltages and clocks and all that(but I still
> feel it shouldn't be all that hard to do).
>
> Thanks,
> AD
>
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It looks like some kind of reprogrammable array. Maybe an FPGA could do the trick.

I think I'm gonna dig more deeply... could be interesting!

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- *Follow-Ups:*
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 - ◇ *From:* Abstract Dissonance

- *References:*
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