

Firmware: Failures and triumphs

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Firmware – What the heck is that?

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- New features can be added when you upgrade
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- Firmware is a file that contains instructions.
- New features can be added when you upgrade
- Firmware is all around us.
- Transceivers, Cars (ECU), this very laptop, your PC, SKY receiver, TV, even some “SMART” tech like toasters, fridges and washing machines.
- Even a remote control can have upgradable firmware!

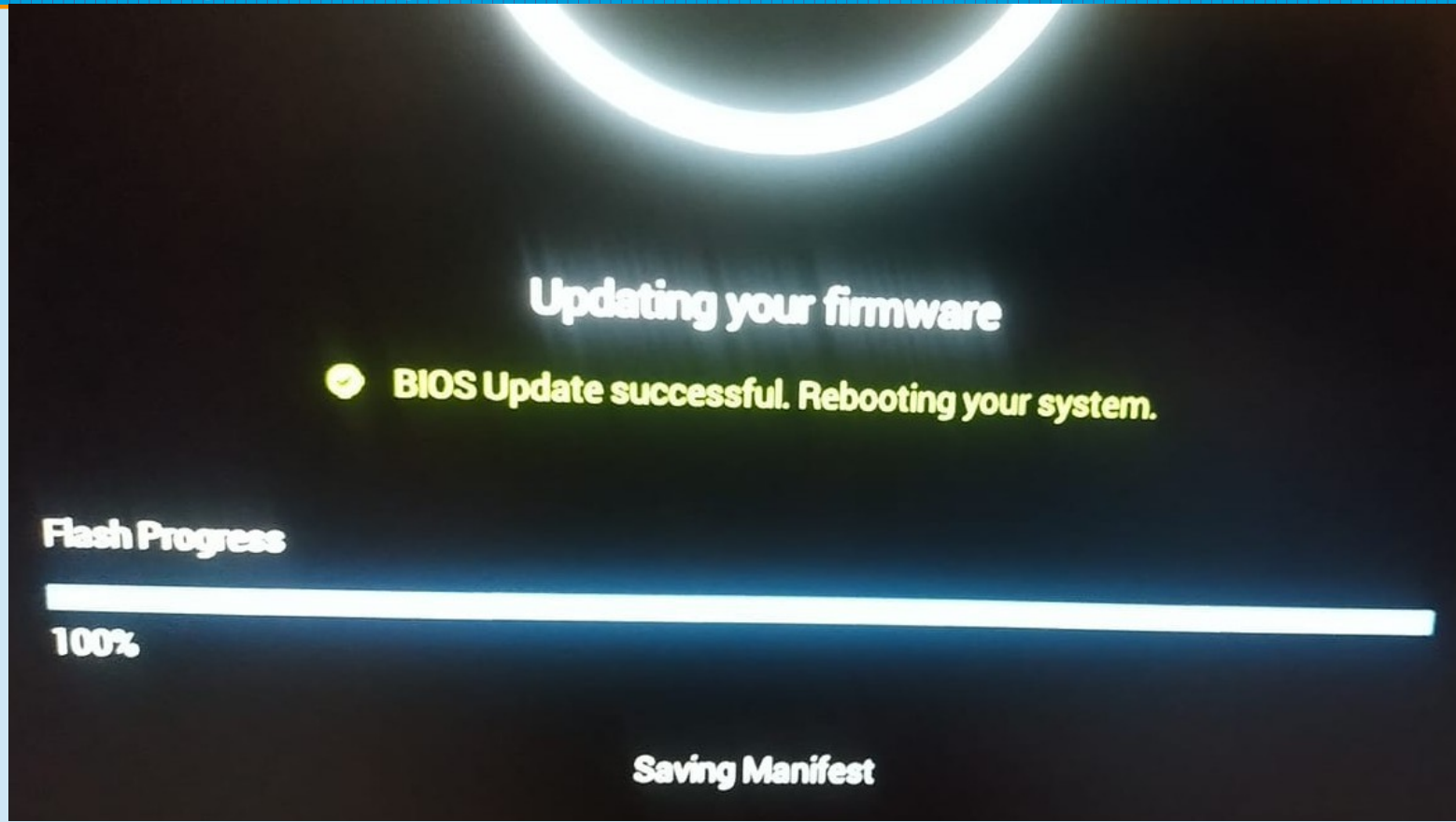
If it's not broke.....

- Its important to know the risk of upgrading
- Can a failure be rolled back?
- Can I save my existing firmware just in case?
- Does the upgrade bring something useful?
- If the answer is no, don't fix it.

Taking the plunge :)

- So, you decide to go ahead and brave the upgrade.
- You follow the manufacturers instructions and you cross your fingers and hope...

Getting it right.....



Aww Shit....



Getting things really wrong....



Options

- Does your device have a UART?
- Does your device have a separate EPROM?
- Thankfully, we can get some data from both :)
- First we need some tech info.
- Lets interrogate the UART.

Finding UART

- Open your device and look for several unused or unpopulated pin headers. Sometime they get hidden or deactivated.
- Some manufacturers are crafty and place a high Ω resistor in the path, especially the TX line. Easy to defeat :)
- Demo Time

No UART?

- If you have no UART, check the datasheet for the main IC
- Still no UART?
- Time to deep dive.

Eprom

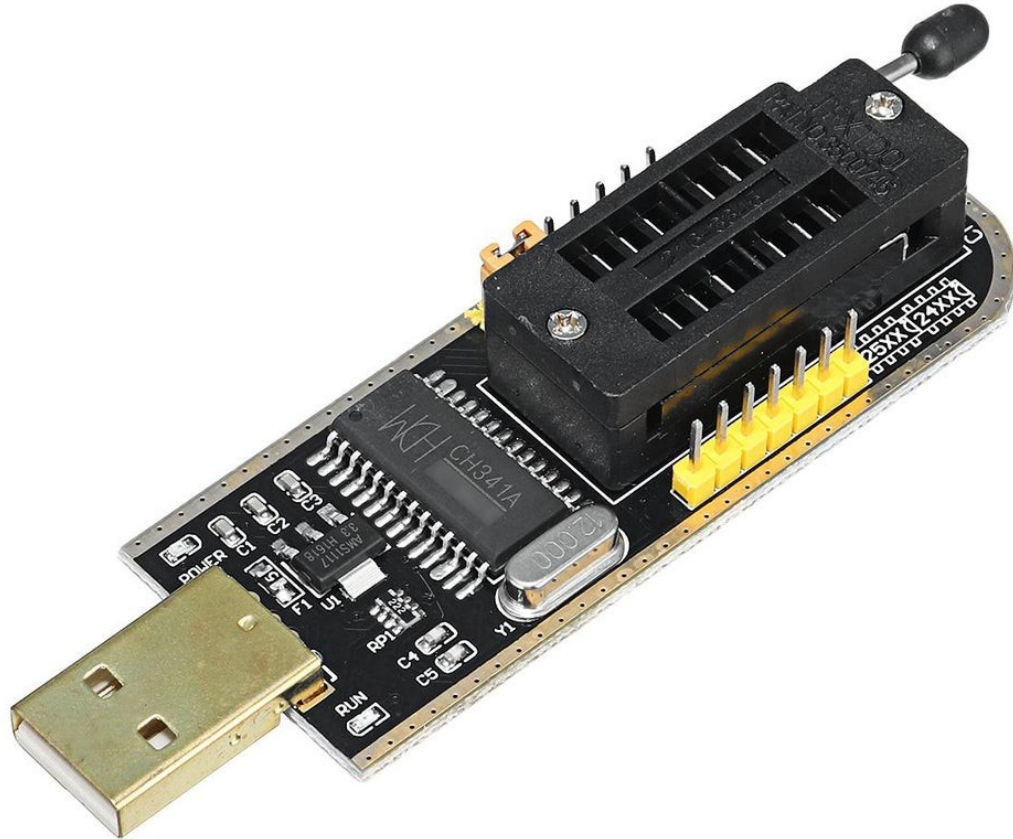
- An EPROM is designed to hold information.
- Calibration data in industrial systems is often stored in EPROM
- Eproms come in different flavours
SPI, I²C, RS232, NAND Flash, eMMC (Big list truncated)
- Why not use an EPROM programmer?

Eprom Progammers

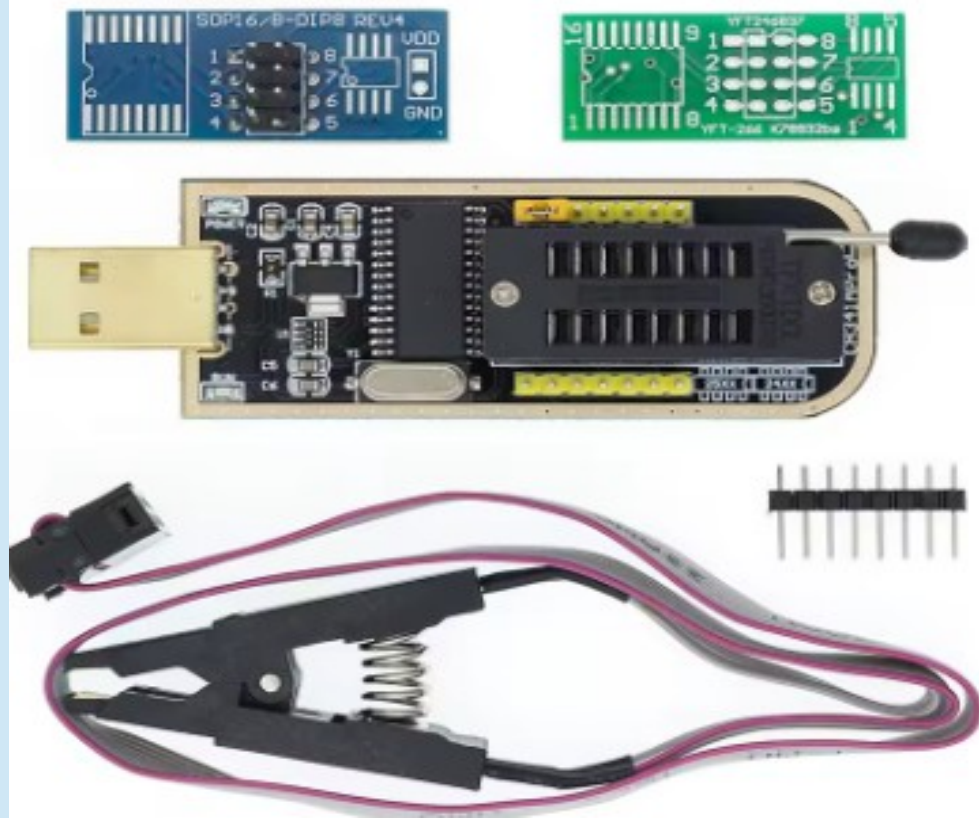
- Eprom programming hardware used to be expensive and niche.
- A huge range of options are open to the hobbyist.
- Now more than ever, some hams and electronics enthusiasts have access to affordable kit and even make SDR transceivers for next to nothing.

Programmers...

- Cheap:



Cheap!



£ 2.73

Wholesale 5+ pieces

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KIT

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