Cyborg

> **WARNING** This article includes imagery that may be disturbing to some people. It shows opened human tissue and blood.

Name	Cyborg
Description	How to become a cyborg you ask? Well, before you start replacing body parts you might just wanna add to them!
Status	Finished successfully - Followup
Contact	Peter Alfons Loch
Participants	Peter Alfons Loch, de_jose_wees_de_wee, HerrCortexGaming (not a Member)
External Hands	"Needles & Skins" Piercing studio
Implants	"X2.1 Dual" by iamrobot, "xLED" by Dangerous Things, "xSIID" by Dangerous Things
Probable future implants	"Vivokey Apex Flex" by Dangerous Things, "xDF2 DESFire EV2" by Dangerous Things

Implants

The most common kind of body modification is to implant electronics inside of the human body. These can be medical devices like pacemakers or RFID/NFC chips.

RFID/NFC

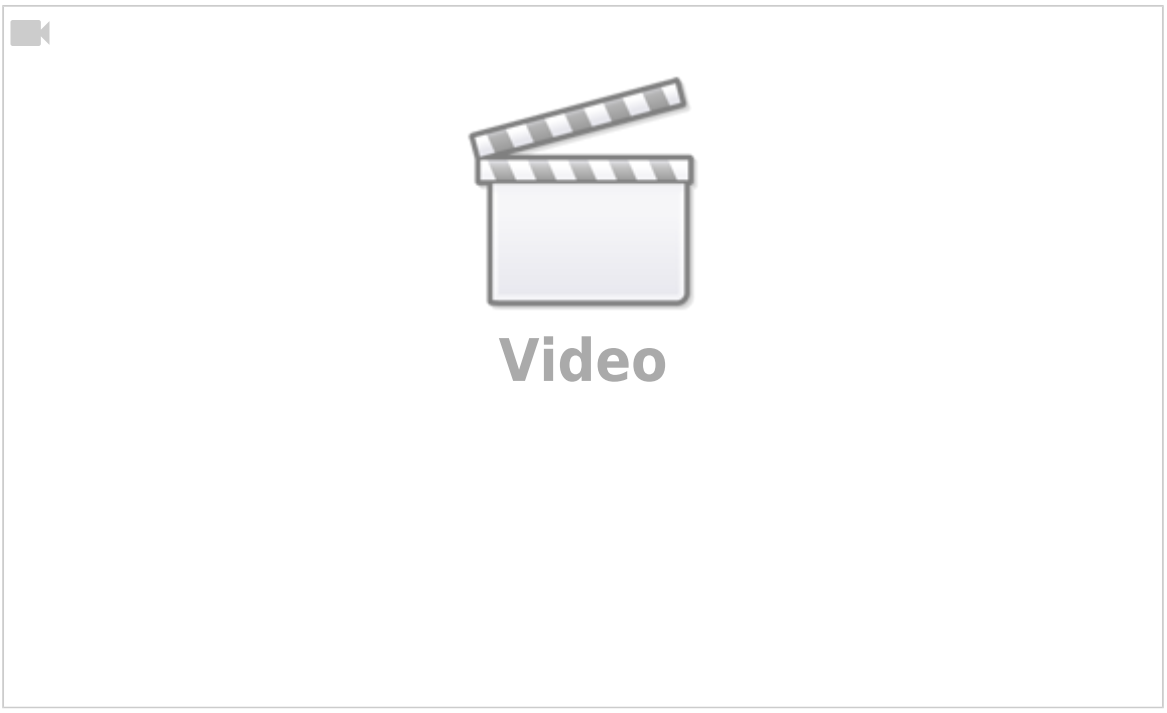
RFID/NFC chips that can be implanted have the common use for access control and authentication. But it also is possible to use these implants to replace contactless payment cards

Implanting RFID/NFC chip

We will document the implanting of the chips we will be getting. We have decided for the X2.1 Dual implant as our first implant. It includes an RFID 125kHz chip as well as an NFC NTAG216 (13.56MHz) chip in one capsule. The implant measures 15mm in length and 2mm in diameter. It is bigger than the usual 12mm for these kind of implants so it is about the size of 2 rice corns in length.

Documentation

> **FINAL WARNING:** This video includes the opening of human tissue and blood.



Here we will provide a video of the implantation procedure.

Important first steps

All MiFare compatible tags can be write-locked. This is however permanent and you probably do not want your implanted tags to be read only. All MiFare compatible Tags, except MiFare Classic, therefore have lock-prevention. This will make the tags not lockable, and is also permanent.

You can write protect the tags with a password. Every time you want to rewrite on the tag you will need the password. This is non permanent.

So we recommend, for implants, to use lock-prevention and a password. This will make your tag

future-proof and protect your data from being overwritten or locked, either by accident or by a malicious person.

Implants and cars

The implants can be used in different kinds of experimental situations.

Unlocking car doors

Brand	BMW
Model	E34 1997
Sub-project responsible	de_jose_wees_de_wee

Starting car

Brand	BMW
Model	E34 1997
Sub-project responsible	de_jose_wees_de_wee

Implants and regular life

The implants can be used in different kinds of experimental situations.

Business card

Material	Nexus 7 with NFC Tools, NTAG216
Sub-project responsible	Peter Alfons Loch

The easiest of all, just writing a vCard to the tag, to be read by any NFC capable mobile phone.

Bitcoin wallet

Material	Nexus 7 with NFC Tools, NTAG216, Bitcoin wallet generator with Bip38 support
Sub-project responsible	Peter Alfons Loch, de_jose_wees_de_wee

Access control

Material	USB HID RFID Reader, RFID Tag 125kHz, Nuki lock with Bridge, Raspberry Pi
Sub-project responsible	Peter Alfons Loch, de_jose_wees_de_wee

Access control is one of the easier things to do with RFID/NFC. By using RFID you just needto be able to read the UID of the tag. RFID is very unsafe, meaning that it is easy to just copy the tag and write it to another chip. But for this to happen, there must be malicous intent. NFC on the other hand can either work like an RFID tag by just providing a UID (common for lockers like in public pools, they usually just register the UID). Or you can write data onto the tag. Depending on the tag used this can be encrypted. MiFare classic seems to be the most unsafe,since it can easily be cracked. NTAG2XX, MiFare ultralight and MiFareDesfire EV series have better encryption. So if you use encryption make sure to use the right tag, especially when you want to lock items of high value. The safest would be a Java-card (JCOP series). These tags, can run small applications and even include a token generator, and encrypted transmission. Most NFCenabled debitcards use these. (Credit cards, on the other hand, usually have a mag-stripe fallback which is very unsafe.)

Contactless payment (proof of concept)

Material	Nexus 7 with fidesmo, Vivokey Flex One
Sub-project responsible	Peter Alfons Loch

Issues with RFID/NFC implants

Useless Implants

xLED

It glows when near an NFC field. It has been ordered and will be implanted into Peter Alfons Loch.

Malicious uses

> This part shows proof of concepts. Do not try to copy, steal and/or crack tags, without the necessary authorisations.