Data Expert Technology Makes Possibility

Visual NAND Reconstructor

Chip-off Data Recovery & Digital Forensic analysis of broken flash storage devices.

NAND Flash Memory

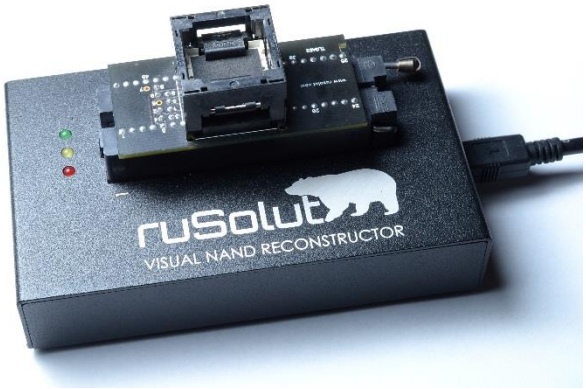
- USB
- SSD
- SD Card
- Monolithic Flash Media
- Micro SD Card
- MS Card
- XD Card
- Digital Voice Recorder
- MP3 Player
- Tablet
- Smartphone

Typical Scenarios

- Physical damage
- Electrical damage
- Analysis of "non-addressed areas" of NAND
- Firmware failure
- Thermal damage
- Non-recognizable disk in OS

The VNR hardware consists of flash memory reader and a set of adapters for different NAND chip packages.

The reader is connected up to the computer with a mini USB 2.0 plug. It has to be connected to start software and save data.



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STATER KIT

(Included in VNR package)

TSOP48 / LGA52 / BGA100 / BGA152 / BGA154 / TSOP56 / BGA224 / MONOLITH

SMARTPHONE KIT

BGA137

BGA169 eMMC 10×11

BGA169 eMMC 11.5×13

BGA169 eMMC 12×16

BGA169 eMMC 12×18

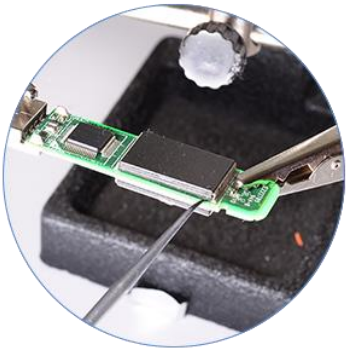
BGA169 eMMC 14×18

STANDARD KIT

BGA152 / BGA100 / BGA132

The chip-off data recovery & digital forensics methodology used in cases when data access through standard device interface is not possible (physical, electrical, FW or other damage).

In such cases it's necessary to unsolder the NAND flash memory chip, because it contains all the user's data. In most of damage incidents the NAND chip remains fully functioning.



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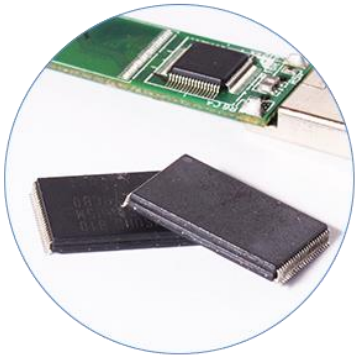
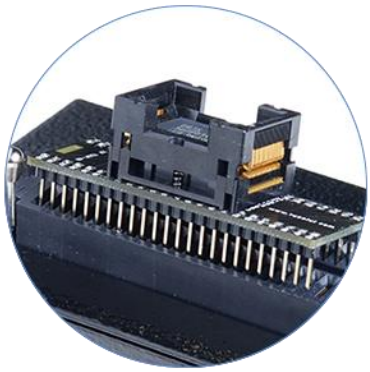
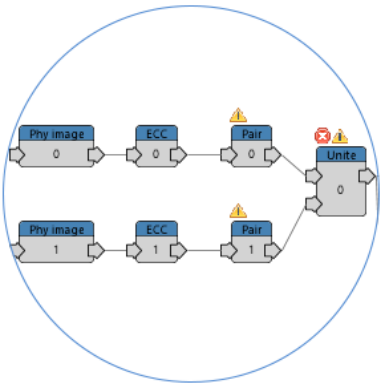
There's vast variety of packages of modern NAND chips exist (TSOP48, TLGA52, BGA100, BGA152, etc.). In order to read physical image of data out of memory chip it's necessary to choose appropriate adapter from Visual NAND Reconstructor kit.

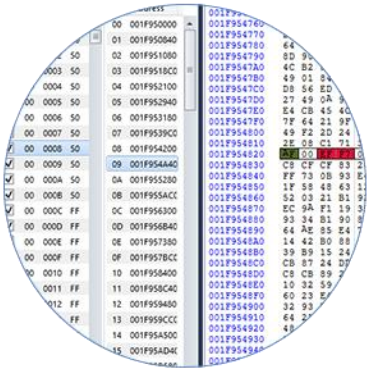




When the flash chip is connected to adapter it's necessary to connect this assembly to VNR Reader and read physical image (dump) to a file.

And secondly, virtual blocks must be filtered and sorted in logical sequence, using adjustable Block translation algorithm of VNR.





In order to extract data, the physical image must be converted to logical image, because controller transforms data in transfer channel according to its configuration. Firstly, all data transformations brought by flash controller must be removed.

At the end of process when physical image converted to logical image, it is a time to save user's files or the whole file system image for further forensic analysis.