



2024







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WHAT WE DO?

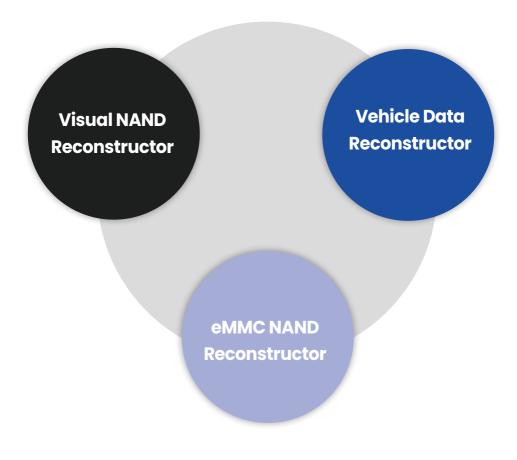
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Rusolut is a global leader in digital forensics, data recovery, and reverse engineering. Our solutions are designed to be both powerful and easy to use, enhancing the efficiency of data recovery engineers, digital forensic investigators, and other experts, ensuring optimal data access results.



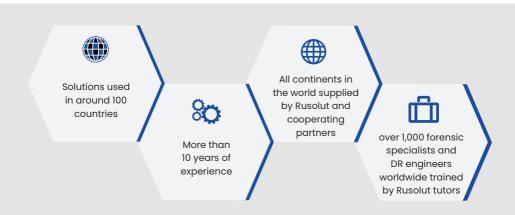
RUSOLUT PLATFORM

To maximize benefits for our users, we designed special concept of Rusolut platform —an integrated suite of technologies that addresses EVERY branch of flash data recovery and digital forensics.



RUSOLUT PLATFORM

User success Model is built on three core components: bestof-breed solutions, intensive training classes and professional technical support.



All Three Market Pillars

We successfully supply all three market pillars with Rusolut technologies



- Data Recovery Companies
- · Private clients
- Electronics manufacturers



Government

- Law enforcement agencies
- Forensic
 laboratories
- Police units
 - Other government and security agencies



Scientific

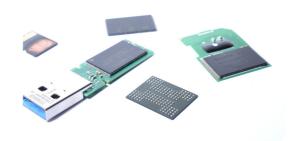
- Universities and technical colleges
- Scientific academies
- Research
 departments and
 development
 Centers

VISUAL NAND RECONSTRUCTOR TECHNOLOGY

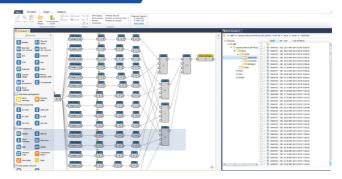
Visual NAND Reconstructor (VNR) is universal solution for chip-off data recovery and forensics analysis of any kind of broken flash devices. VNR includes powerful and flexible software and a fundamental hardware part

Works with:

- flash drives
- memory cards
- · smartphones and tablets
- multimedia devices
- voice recorders
- IoT devices
- other non-standard and monolithic devices



Software outstanding feature:



- Integrated Online Solution Base
- · Digital forensics analysis of vehicle computers, IoT and network devices
- Visual analysis approach
- Built-in Advanced SQLite carving engine
- · Android data extractor
- Advanced algorithms for error correction in NAND chips
- · XOR key synthesis tools powered by Artificial Intelligence
- · Largest database of non-standard and monolithic devices
- Comprehensive software for logical image reconstruction
- Built-in JPEG carving engine with file integrity control
- JPEG and office files carver with validity control
- Intelligent File assembler recovers FRAGMENTED pictures, videos and office files from bits and pieces gathered from full device space

VISUAL NAND RECONSTRUCTOR

VNR Essential Kit

This Essential kit contains:

- VNR Software
- VNR Reader

Set of most widely used adapters:

- TSOP48 ZIF adapter
- TLGA52 ZIF adapter
- BGA100 adapter
- BGA152 adapter
- Monolith adapter
- free year of Premium Support subscription
- Online StartUp training 2.0



VISUAL NAND RECONSTRUCTOR ADAPTERS

VNR Standard Kit

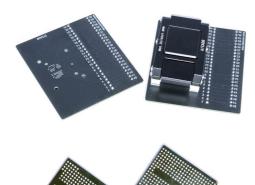
- BGA100 ZIF adapter 12x18
- BGA107 ZIF adapter 10,5x13
- BGA132 ZIF adapter 12x18
- BGA137 ZIF adapter 10,5x13
- BGA152 ZIF adapter 14x18
- LGA60 ZIF adapter 18x14
- TSOP48 WIDE ZIF adapter

VNR eMMC Imager Kit

- BGA169eMMC 14x18 adapter
- BGA169eMMC 12x18 adapter
- BGA169eMMC 12x16 adapter
- BGA169eMMC 11.5x13 adapter
- BGA169eMMC 10x11 adapter
- BGA 162 eMMC
- BGA 186 eMMC
- BGA 221 eMMC



BGA 316/BGA 272 Adapter



This adapter consists of one socket and two boards designed for BGA316 and BGA272 chips

BGA272

- Data bus: 2 x double 8-bit
- Number of CE/crystals: 2 x 8 CE
- Chip size: 14 x 18

BGA316

- Data bus: 2 x double 8-bit
- Number of CE/crystals: 2 x 8 CE
- Chip size: 14 x 18

Solidering Kit

5 x SD and 5 x UFD Soldering Adapters with outputs for Logic Analyzer





VISUAL NAND RECONSTRUCTOR MONOLITHIC ADAPTERS









SANDISK MONOSD

NAND adapter designed for damaged SD cards made by Sandisk. Adapter supports 3 different sizes of devices which are common in ~90% of Sandisk SD cards The databus size is 8 bits

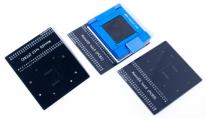


SANDISK MICROSD

NAND adapter designed for damaged microSD cards mainly made by Sandisk.

Adapter supports multiple card's pcb designs which are common in ~80% of Sandisk microSD cards. The main criteria is 3 rows of 7 pads on the device.

The databus size is 8 bits.





MONOSD 4X10 PADS

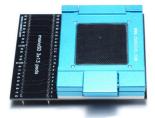
This adapter is designed for SD cards with columns of pads on sides. It has 3 different boards to support multiple different devices. The PCB1, PCB2 boards have single 8-bit data bus and PCB3 board has dual 8-bit data bus. The PCB2 and PCB3 have additional power (VccQ) which is necessary to improve the quality of NAND reading.



SAMSUNG MICROSD

This adapter is designed for Samsung micro SD cards with specific vertical pattern of double pads on the right side of the device. It has 3 different boards to support multiple different devices. All PCBs have single 8-bit data bus. The socket can be easily swapped between the boards, allowing you to change several different devices in a short time. Supported ECC BCH code size are: 22B, 50B, 90B, 122B, 124B, 126B.

Please note: EVO/PRO series of microSD cards is not fully supported





MONOSD 3X13 PADS

This adapter is designed for monolithic SD cards with a very common pattern of technological pads. Adapter supports three different sizes of device and therefore has three frames in kit. Adapter is designed for single/dual 8-bit databus flash chips.









MONOUFD 6X3 & 6X7 PADS

This is the world's first socket adapter for monolithic USB flash disks. Adapter supports three different pinouts and therefore has three boards and two frames in kit. The socket and frames can be easily swapped between the boards. Adapter is designed for 8-bit single databus flash chips









SANDISK MONOUFD

This adapter is designed for damaged Sandisk flash drives with both USB 2.0 and 3.0 interfaces. This adapter supports 3 different pinouts and therefore has 3 PCBs and 3 frames. The adapter is designed for devices with single 8-bit data bus.

The socket and frames can be easily swapped between the boards, allowing you to change several different devices in a short time.





MICROSD 6X4 PADS

NAND adapter designed for damaged microSD cards made by Kingston, Kingmax, Toshiba, Apacer, Goodram and other brands. Adapter supports multiple card's pcb designs with small and large pads.

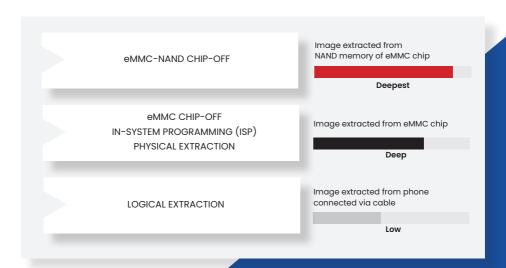
The main criteria is 6 columns of 4 pads on the device. The databus size is 8 bits

EMMC-NAND RECONSTRUCTOR TECHNOLOGY

Our developers have created a new standard of data recovery from eMMC memory via the NAND interface. This revolutionary technology is called **eMMC-NAND Reconstructor**

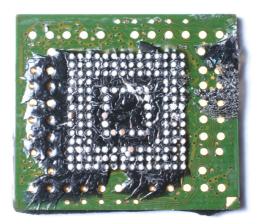
eMMC- NAND Reconstructor (eMMC-NR) is solution for data extraction and recovery from eMMC chips through NAND interface. This is solution that provides **the deepest level of data recovery** from areas of eMMC chips that have never been accessible before:

- data recovery from overwritten/garbage blocks of NAND memory in eMMC chips
- data recovery after factory reset/format
- data recovery from damaged eMMC chips



The only salvation for the damaged eMMC chips

One of the main advantages of eMMC NAND Reconstructor that is worth paying attention to is supporting dead eMMC chips.



Symptoms of damaged eMMC:

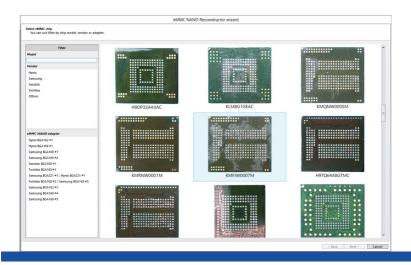
- Not recognized when connected to eMMC adapter
- Recognized but shows weird capacity
- Recognized and first 32-64
 MB accessible
- Recognized but reads garbage

eMMC-NAND Reconstructor is the only rescue in case of such damages as:

- Water, thermal, physical damages
- Damages of tracks/pads on chip's PCB
- Damages of wire bonding inside chip
- Human factor during data recovery process

EMMC-NAND RECONSTRUCTOR SOFTWARE

eMMC-NAND Reconstructor supports various types of memory chips and therefore it offers the largest number of different interfaces.



Software outstanding features:

- Automatic and semi-automatic logical image reconstruction
- Automatic solutions/resources for chips with instant online synchronization
- Built-in chip reading functions
- Comprehensive and intuitive user interface
- eMMC-NAND Reconstructor works only in couple with Visual NAND Reconstructor Essential kit.

eMMC-NAND Reconstructor purchase options:

- 1. Basic Package Software with 1 eMM-NAND Adapter of a choice
- 2. Full Edition Software with all available eMMC-NAND Adapters
- 1 year of free Priority Support subscription is granted for both options.

You can buy an additional/newly released eMMC-NAND adapter at any time.

EMMC-NAND RECONSTRUCTOR ADAPTERS

TOSHIBA BGA1# 169

NAND data bus: single 8 bits

Chip size: 11,5×13

Supported eMMC chips:

THGBM5G7A2JBAIR
THGBM4G5A1JBAIR
THGBM5G6A2JBAIR
THGBMBG7D2KBAIL
THGBMBG6D1KBAIL
THGBMBG8C2LBAIL
THGBMBG8C2LBAIL

TY90HH131625RA

...and some others with same technological pads to be confirmed with technical support









Sandisk BGA169 #1

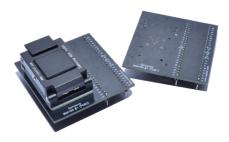
NAND data bus: single 8 bits Chip size: 11,5×13; 12×16; 14×18 Supported eMMC chips:

 SDIN7DP2-4G
 SDIN8DE2-8G

 SDIN7DU2-8G
 SDIN5C2-32G

 SD5DH26A-4G
 SDIN5D2-4G

SDIN7DP4-32G SDIN5C2-8G China
...and some others with same technological
pads to be confirmed with technical support







Samsung BGA169 #1

NAND data bus: single 8 bits

Chip size: 11,5×13

Supported eMMC chips:

KLMAG2GEAC KMVTU000LM KLM8G2FE3B KLMAG4FE4B

KLMBG4WEBD (partial)

...and some others with same technological pads to be confirmed with technical support







Samsung BGA169 #2

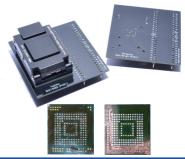
NAND data bus: single 8 bits Chip size: 12×16;14×18

Supported eMMC chips:

KLMAG2GE4A KMV3U000LM KLM8G1WE4A KLMBG4GE2A

KLMAG2GE2A

...and some others with same technological pads to be confirmed with technical support



Toshiba BGA169 #2/ Samsung BGA 1693#3

NAND data bus: single 8 bits

Chip size: 10×11

Supported eMMC chips:

THGBM5G7A4JBA4W

KIMAG4FFAR

KLM8G2YE4C (partial ECC)

...and some others with same technological pads to be confirmed with technical support





Samsung BGA169 #4

NAND data bus: dual 8 bits

Chip size: 12×16

Supported eMMC chips:

KMVYL000LM

...and some others with same technological pads to be confirmed with technical support







Samsung BGA169 #5

NAND data bus: single 8 bits

Chip size: 11,5×13

Supported eMMC chips:

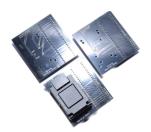
KMV3W000LM KLMAG1JETD (partial

solution)

KLMCG2UCTA (partial solution)

KLMDG4UCTA (partial solution)

...and some others with same technological pads to be confirmed with technical support









Samsung BGA162 #1

NAND data bus: single 8 bits

Chip size: 11,5×13

Supported eMMC chips:

KMK5U000VM KMN5U000FM

KMN5U000ZM KMK5X000VM (partial

ECC)

KMN5X000ZM (partial ECC)

KMN5X000ZA (partial ECC)

...and some others with same technological pads to be confirmed with technical support



Hynix BGA162 #1

NAND data bus: single 8 bits

Chip size: 11,5×13

Supported eMMC chips:

H9TP32A4GDBC H9TP32A8JDMC H9TP32A4GDMC H9TP32A8JDBC

...and some others with same technological pads to be confirmed with technical support







Hvnix BGA169 #1

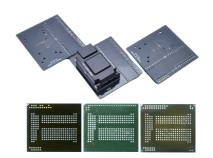
NAND data bus: single/dual 8 bits Chip size: 11,5×13;12×16;14×18

Supported eMMC chips:

H9DP32A4JJAC H26M41103HPR H26M52103FMR H26M21001ECR H26M64003DOR H26M64002DOR H26M54003EMR H26M64103EMR

H26M88002AMR

...and some others with same technological pads to be confirmed with technical support



Samsung BGA221 #1 / Hynix BGA221

NAND data bus: single 8 bits

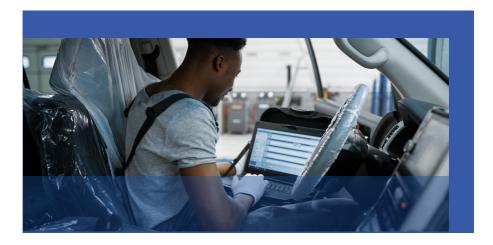
Chip size: 11,5×13

Supported eMMC chips:

KMONW000SM KMRNW0001M KMFJW0007M KMQNW0006A H9TQ64A8GTMC H9TQ64ABJTMC H9TQ17ABJTMC H9TQ64AAETMC

...and some others with same technological pads to be confirmed with technical support

Viehicle Data Reconstructor - Coming Soon!



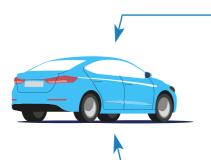
The Vehicle Data Reconstructor (VDR) is developed to set a new standard in digital forensics for vehicles. Designed to surpass existing solutions, VDR ensure comprehensive, reliable, and efficient data acquisition of crucial digital evidences from vehicles, providing forensic experts with easy-to-use tool with extensive possibilities and advanced features.

UNMATCHED CAPABILITIES

The Vehicle Data Reconstructor is engineered to function in all conditions – whether the vehicle is functioning or not, crashed, drowned, or burnt – VDR requires only the infotainment system or other telematic/wireless modules for examination, enabling labs to manage multiple cases the same time without needing the entire vehicle.

Works with ALL Vehicles that use modules designed by vendors, such as: Bosch, Ford, Magnetti Marelli, Harman, Harman Becker, LG, Continental, TechniSat, Panasonic, GM, Preh, Peiker, Alps electronics, Clarion, Delphi, Johnson control, Alpine, Novariant, etc. Our research methods and effi-cient support team allows to add new devices within hours/days.

COMPREHENSIVE DATA ACQUISITION



VEHICLE-RELATED DATA

- ✓ Vehicle System Data: VIN, serial and part numbers, FW version, MAC/IP addresses, etc.
- ✓ Events: WIFI/Bluetooth/USB connections, vehicle power on/off, start/stop, reboots, door/light data, odometer, fuel consumption, system logs, etc.
- ✓ GPS navigation data: routes, tracklogs, POIs, trackpoints, destinations, GPS sync events, saved locations, etc.
- ✓ Built-in applications: Traffic, weather, radio, etc.

USER-RELATED DATA

- Connected devices: Smartphones, USB/ SD cards, WIFI/Bluetooth logs, device list, timestamps, serial numbers, etc.
- Smartphone synchronized data: Device list, Calls, Phonebooks, SMS, Media, App data, etc.
- ✓ Device identifiers: Bluetooth/WIFI MAC addresses, phone names, WIFI access point info, installed apps.

Why Choose Rusolut VDR?

Universal Functionality

VDR operates in all scenarios, ensuring data recovery even from severely damaged vehicles or non-functional systems.

Data acauisition without need of the vehicle

Simplifies forensic examinations by needing only the infotainment system or telematics/wireless module, not the entire car.

100% Read-Only Forensic Access

Guarantees clean, unaltered data acquisition with no risk of adding or modifying data or recording any events during examination.

Firmware Version Independence

Data access is not hindered by the system's firmware version, ensuring seamless data acquisition no matter what version is used.

Deepest possible access to the data

Beyond information from the file system, VDR reads data from previous versions of files and from obsolete NAND blocks, significantly expanding forensic analysis capabilities

Fastest Data Acquisition

Achieves the fastest data extraction speeds up to 10 MB/s for NAND chips and 50 MB/s for eMMC chips.

Support of Proprietary and Embedded File Systems

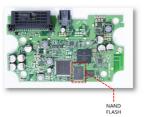
Supports a range of proprietary file systems, including QNX, YAFFS, UBIFS and other FTLbased embedded file

Non-Invasive Adapters

Utilize solderless adapters combinina Chip-off approach advantages and noninvasive data acquisition without causing

How Does It Work?

Data acquisition is performed either via chip-off or solder-less adapter whether it's NAND or eMMC for all systems based on supported memory chips such as TSOP48, BGA63 (two sizes), BGA100, BGA153/169, BGA137, BGA107 and others with universal adapter (Monolith)





Raw dump read and converted to logical image





Files and data are extracted, parsed according to format and saved.



Data report is generated based on supported system and available data



WHAT'S INCLUDED

- Powerful software for physical dump acquisition and further vehicle data extraction, including parsers for File systems: QNX6, UBIFS, YAFFS2, FAT12,FAT16,FAT32,exFAT, Ext2, Ext3, Ext4, NTFS, HFSX, others embedded systems based on FTLs. Embedded FTLs....
- **VNR Reader for reading NAND chips**
- Set of all necessary adapters for NAND Flash and eMMC memory chips TSOP48, BGA63 (two sizes), BGA100, BGA153/169, BGA137, BGA107,
- Non-invasive ISP NAND and eMMC adapters enabling direct data extraction from memory chips similar to the chip-off method but without the need to unsolder the chips, thus preserving the integrity of the system without any destroys *
- Forensic report generation tool
- Widest database of the error correction codes to fix bit errors in NAND memory
- Widest database of supported NAND memory chips
- Largest Database of Read-Retry Algorithms required to improve NAND memory reading quality

DATE OF RELEASE

We are excited to announce that VDR technology eagerly awaited by all forensic examiners engaged in Vehicle Forensics investigations, is scheduled to be released in **Q1 of 2025**.

We encourage you to consider your budgets for this upcoming purchase to ensure you can take full advantage of this advanced technology upon release.

For any official quotations and technical specifications required for the formal purchasing process, please do not hesitate to contact us.

^{*} The number of adapters is updated at the time of purchase

Training Classes

About training programs



With 15 years of experience in the field, Rusolut experts have crafted highly effective and well-rounded training programs. These courses open the door to advanced techniques in chip-off digital forensics and data recovery. Many of our clients have praised these trainings as the best they've ever experienced, recognizing the blend of in-depth knowledge and practical skills they provide.

We offer two types of training sessions: Regular Group Classes and Closed-Door Classes.

Regular Group Classes are conducted in English and follow a pre-set schedule, available either Online or On-Site at our headquarters in Warsaw, Poland.

Closed-Door Classes are tailored to the needs of individual groups, with flexible timing and dates to suit the participants. In these sessions, you can bring in a live interpreter, choose your preferred location, and enjoy a private training experience exclusive to your group.

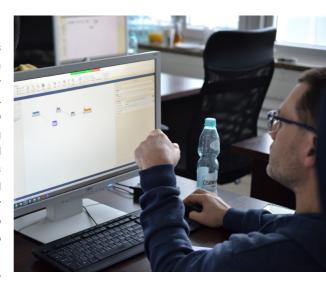
Why should attend

- Over 1000 trained forensic professionals from all over the world
- ▶ The most efficient combination of theory and practice
- Small groups and individual approach to each student
- Special tricky cases selected by Rusolut experts that will prepare you for various surprises in your daily work
- Instructors appreciated at the worlds largest industry events such as Techno Security, CEPOL and others
- Training completion certificate for each participant

Chip-Off StartUp 2.0

This foundational course provides a comprehensive introduction to the Chip-Off data recovery process from NAND memory devices. You'll begin by learning how NAND memory devices work, including their structure, components, and functions. The course then guides you through the major steps and workflows of the data recovery process, demonstrating how to use Visual NAND Reconstructor to perform these tasks.

In addition to theoretical knowledge, the course includes practical



exercises based on real-world cases, ensuring that you can apply what you've learned. This training is ideal for beginners and is essential for anyone looking to build a solid foundation in Chip-Off Data Recovery. The program is delivered through video lessons with live consultations and ongoing support.

What you will learn:

- Components and functions of NAND memory devices
- Structure of NAND memory
- How controllers transform data during writing
- Converting physical dumps to logical dumps
- Key steps in the Chip-Off Data Recovery process
- Bit error correction techniques
- Data descrambling methods
- Block translation
- Peculiarities of major controllers

Training Format:

Online: Video lessons for self-study with controlled practical tasks + 5 days of live consultations

Duration: 5 days

Data Recovery Expert - NEW TRAINING!

This advanced course will boost and significantly expand upon the knowledge you gained in StartUp 2.0. It is the final step in mastering your Chip-Off Data Recovery skills. This comprehensive training provides you with a wide array of complex cases and widely used controllers that every Data Recovery Expert must be able to handle, including those from Sandisk and modern Silicon Motion and Phison controllers.

The course covers data recovery from unsupported devices and specially selected complex cases with already known controllers. It shows advanced methods of VNR usage and dump analysis. Every theoretical subject on the training is explained on real practical cases. After course you can literally reverse engineer new devices yourself and get data in cases which seemed to be impossible before. The training also includes one day Hands-On skills mastering. You will discover techniques of correct memory chip unsoldering and its preparation for the further reading and recovery process, as a must-have base that every engineer using the chip-off technique needs to have at his fingertips.

What you will learn:

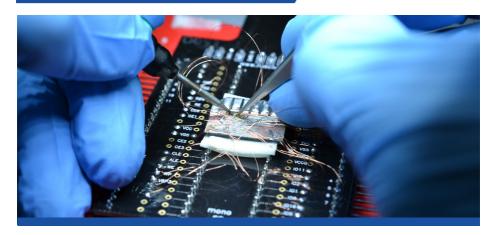
- Data recovery procedures from complex Sandisk controllers, such as Sandisk 4kB
- Data recovery from SM3281L controllers
- Data recovery from FC and DM controllers
- Data recovery methods from devices based on Alcor Micro Controllers
- Data recovery from devices with multiple memory chips
- Analysis and reverse engineering of ECC/BCH
- Analysis of complex service areas and the use of MASK
- Asynchronous page allocation
- Unsupported error correction codes
- Advanced methods of dump analysis
- Techniques for correctly unsoldering memory chips and preparing them
- Block rotation



Available training format: Online / On-Site

Duration: 5 days On-Site / 4 days Online (w/o Hands-on Skill Mastering part)

Monolith Pinout Discovery Training



Devices with monolithic construction are widely produced nowadays, not only because of their small sizes but also due to their higher endurance. To solve such cases is required to find pinout and there is an always a chance that your device will have completely new one. Therefore, we have decided to prepare course mainly focused on pinout analysis and data recovery from monolithic devices. MPD training includes all information you need to work with monolithic devices. It consists of multiple training cases for analysis of signals and presents full methodology of pinout preparation which is examine on practical hands on case with physical device.

What you will learn:

- Safe techniques of soldering mask removal
- Techniques of micro-soldering flash devices
- Work and functions of logic analyzer
- Internal construction of monolithic embedded devices
- Visual analysis of monolithic devices
- Analysis of X-Ray picture
- Signals of NAND memory protocol, recognition and analysis
- Signals decoding using LA software

Available training format:

Online / On-Site

Duration: 3 days

Technical Support



Rusolut aim is not only to develop and provide our customers with purpose-built solutions, but also to make the usage easy and efficient. That is why engineers from Rusolut Support Team do their best to help you with any technical questions.

Types of subscription

Premium Support - if you own VNR only

Priority Support – if you own VNR and eMMC NAND Reconstructor. At a time of purchase, eMMC NAND Reconstructor is permanently linked to VNR reader with the serial number provided by the customer. The only available type of subscription for eMMC NAND Reconstructor owners is Priority Support subscription.

What is included?

Premium/Priority Support subscription includes:

Personal help



We are always ready to help you with any complicated cases and guide you through the data recovery process.

Technical support is provided through the Help Center portal:

https://support.rusolut.com

Software updates



Access to the latest VNR Software updates - **Premium Support**Access to the latest VNR and eMMC NAND Reconstructor Software updates

- Priority Support

Every day, our engineers research new flash storage devices and their configurations to keep Rusolut technologies at

the highest level and follow the market demand. Using the latest software and databases is the only way to recover data from new flash memory devices quickly and efficiently.

Resources database



To follow the dynamically developing market of flash devices, new resources such as NAND chip configs, XOR keys, monolithic chip pinouts, solutions for devices are regularly updated.



Knowledge base

We regularly publish scientific articles to share the latest information with our users. Knowledge Base contains tips and guidelines on the latest features and how to use them correctly.

https://support.rusolut.com/portal/kb

Free Video Materials



We successively share with you specially prepared videos that describe the most important issues regarding

hardware as well as software and its latest updates:

https://www.youtube.com/rusolut

Lifetime warranty



The warranty covers:

- Visual NAND Reconstructor 1-year warranty for reader and 1-month warranty for adapters.
- eMMC NAND Reconstructor 1-year warranty for eMMC NAND adapters
- Warranty is automatically extended +1 year each time when Premium/ Priority Support subscription is renewed - only if the interval between the expiration date and the renewal date does not exceed 1 month.
- Please check technical support conditions for more details: https://rusolut.com/support/



CONTACT US

General questions: info@rusolut.com
Commercial questions: sales@rusolut.com

Technical support: https://support.rusolut.com





