

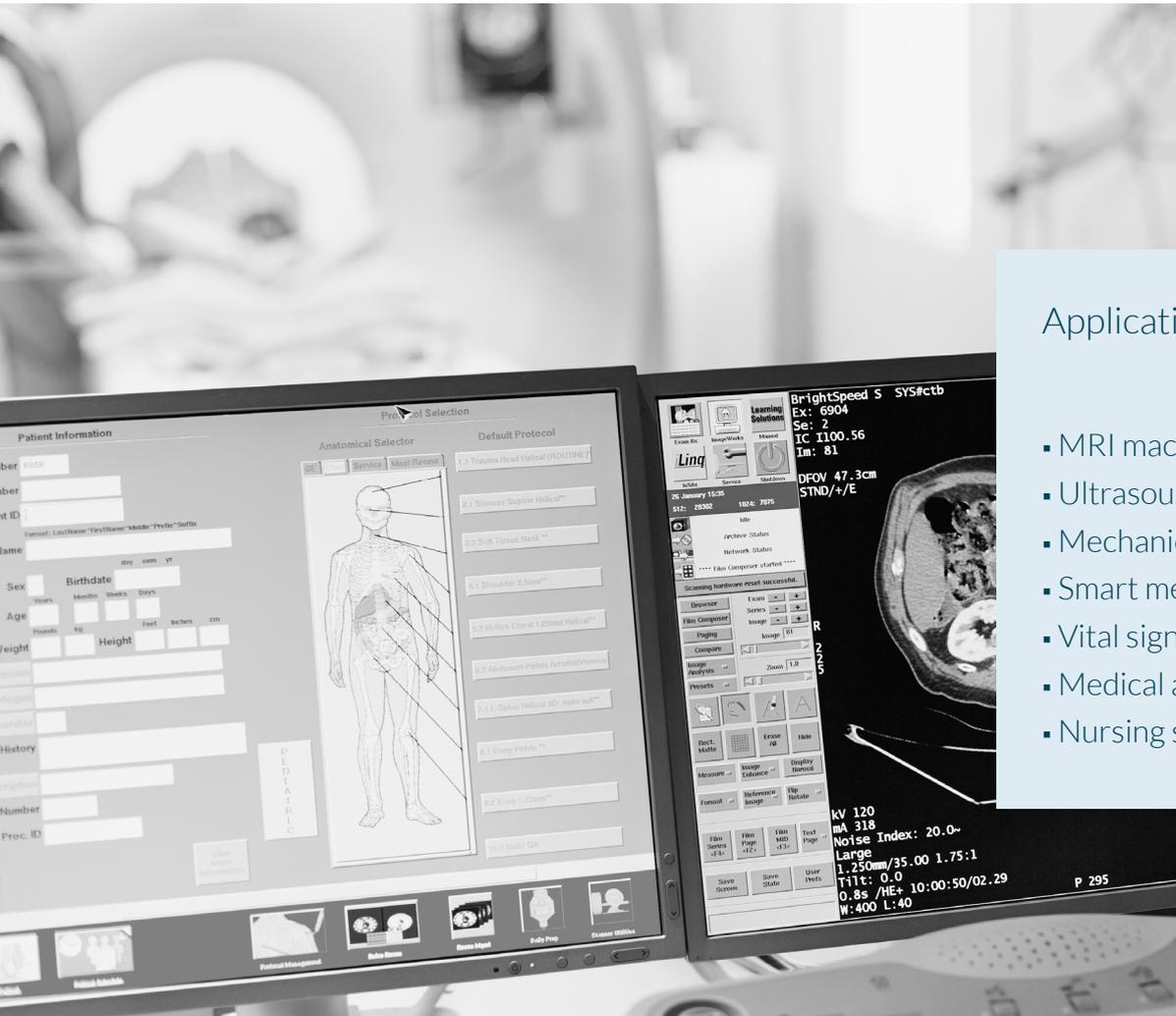
# Innodisk Medical Solutions

Intelligent and Stable Flash Storage, Memory, and Embedded Peripherals Optimized for Medical Applications



**innodisk**

# Introduction



## Applications

- MRI machines
- Ultrasound systems
- Mechanical ventilators
- Smart medical carts
- Vital signs monitors
- Medical all-in-one PCs
- Nursing stations

AI and the Internet of Things hold enormous potential for the future of the healthcare industry. Connected smart devices can greatly enhance diagnostics, patient care, and data analysis – ushering in a new era of medicine.

In the hospital of tomorrow, AI can quickly and seamlessly analyze images and data from each patient, assisting healthcare providers in delivering exceptional care and higher patient throughput. Intelligent connected devices throughout healthcare facilities and all medical applications provide patients with improved care and medical personnel with a better ability to make the right decisions at the right time.

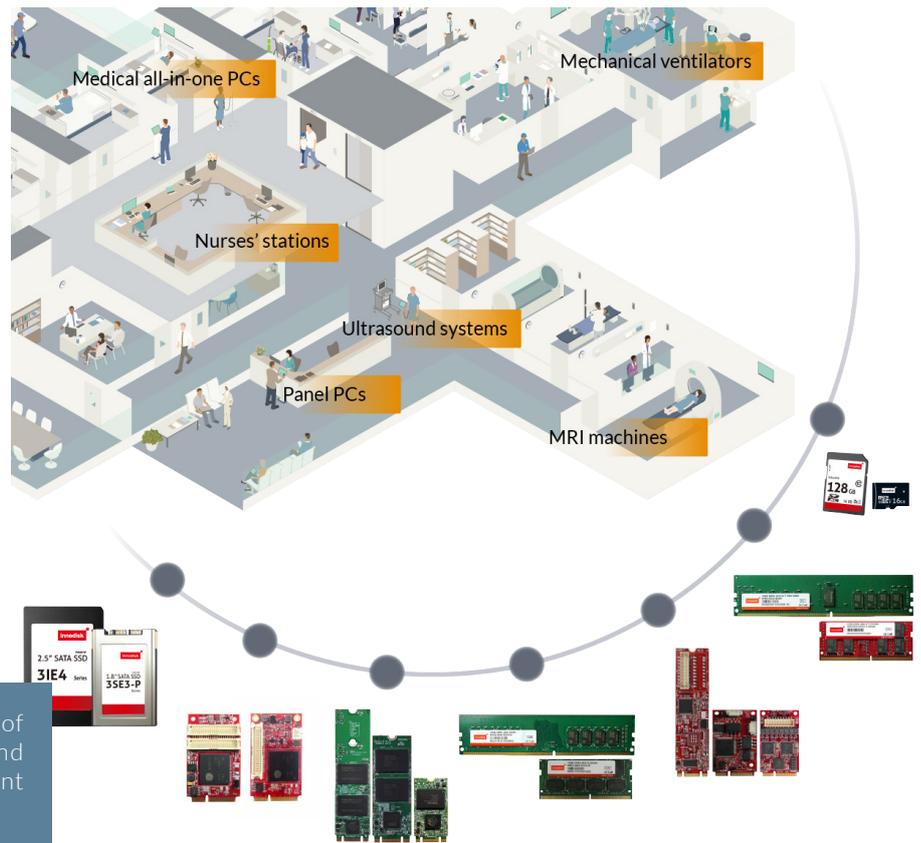
Innodisk is making this vision of a smarter and more connected healthcare industry into reality with sophisticated and comprehensive hardware, firmware, and software solutions. These solutions do not only bring exceptional performance but also meet medical applications' stringent requirements and overcome their unique challenges. That is how we make the future of healthcare possible today.

# Fulfilling All Medical Needs

Critical and life-saving medical equipment requires components that provide the highest levels of stability and reliability – with technologies optimized for medical applications. Innodisk provides total solutions from across its flash storage, DRAM, and embedded peripheral product lines that address these needs in full.

## AI Medical Imaging Solutions

Innodisk offers medical-grade solutions ideal for AI medical imaging applications – providing the highly capable DRAM modules, flash storage devices, and embedded peripherals necessary to empower such equipment for their important work. These solutions do not only provide critical functionality that empower AI medical imaging applications but also withstand the considerable environmental challenges in imaging applications.



Innodisk solutions from each of its product lines can be found in advanced medical equipment worldwide.

## Innodisk's Medical-grade Solutions Total Healthcare Solutions

### Flash Storage

- SLC and iSLC for stability and endurance
- AES-256 and TCG Opal 2.0-compliance for exceptional security

### DRAM Modules

- High performance for any application
- Full range of form factors
- Full legacy support for maximum longevity

### Embedded Peripherals

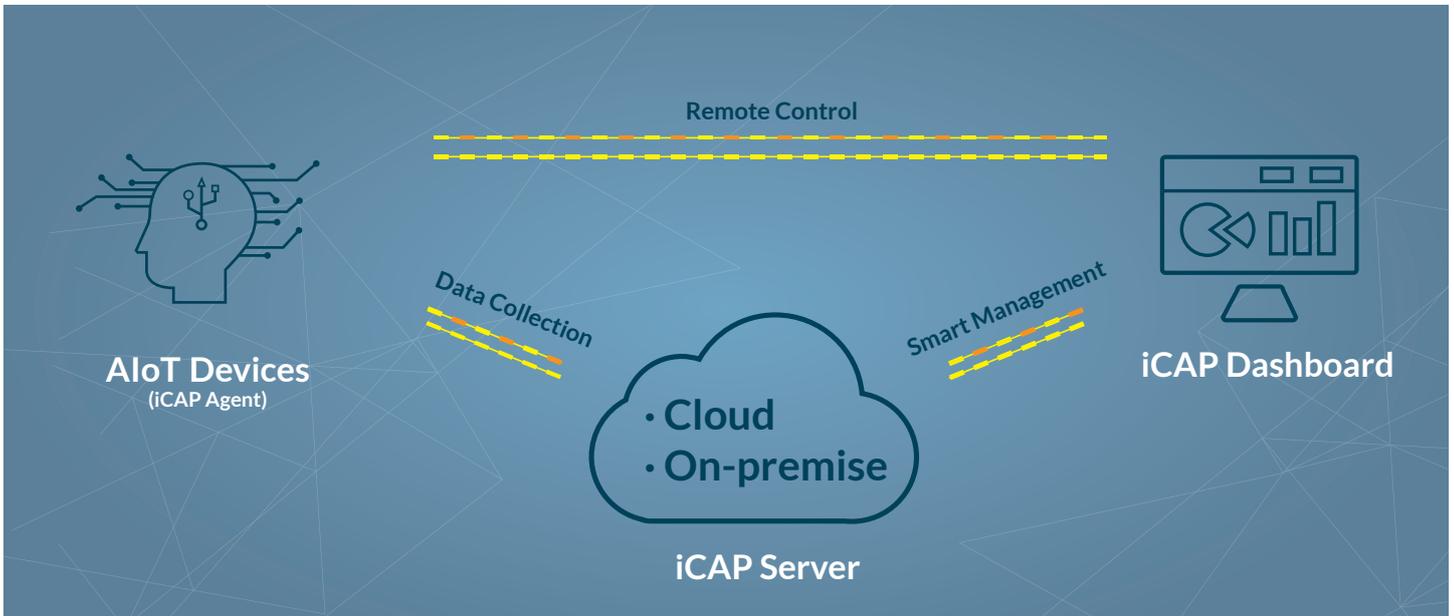
- Wide temperature design for all environments
- Electrostatic discharge protection
- High potential isolation design

# Secure Cloud Management Platform



iCAP™ is a browser-accessed management platform that allows you to monitor the status of solid state drives (SSD), memory and other components in edge devices. This is accomplished by gathering data from all connected devices and storing it on a central server, either on the cloud or on one's intranet. From there the data is easily accessible from your internet-connected cell phone, tablet, or laptop.

## System Architecture



## iCAP Dashboard Management Interface

The screenshot shows a web dashboard with several key features highlighted by callouts:

- Effectively monitor remote device status:** A callout points to the 'Device status' section, which displays a total of 917 online devices and 83 offline devices.
- Keep tabs on current CPU and Memory loading:** Callouts point to the 'CPU Loading' and 'Memory Loading' sections, which use horizontal bar charts to show usage levels across different device categories.
- User-friendly monitoring function allowing the user to manage and analyze storage information in detail:** Callouts point to the 'Storage Lifespan', 'Storage Health', and 'Storage Temp.' sections, which use donut charts and gauges to visualize storage metrics.
- By analyzing the read/write behavior of connected storage devices, iCAP can accurately predict remaining storage device lifetime:** A callout points to the 'Storage Lifespan' gauge.
- Customizable widgets including gauges, Google Maps, and various tables presenting device data:** Callouts point to the 'Storage Health' pie chart, the 'Storage Temp.' gauge, and the 'Google Map(L)' showing a geographical distribution of devices.

## iCAP Advantages

Windows

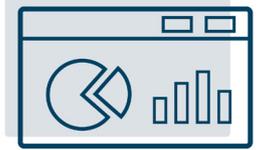
Linux

### Extensive Compatibility

The iCAP agent is supported on both Windows and Linux platforms and can be seamlessly accessed through a wide range of browsers.

### Flexible Dashboard

The user can freely alter the dashboard through a dynamic UI and device grouping and choose the parameters and widgets relevant to their application.



### System Backup & Recovery

iCAP integrates Innodisk's proprietary iCover tool that allows for remotely initialized system backup and recovery.

### Effective Event Tracker

The event notification tracker will log all changes and keep the user up-to-speed, enabling swift resolutions to any issues that may occur.



### Comprehensive Indexing

The index table accessible through the dashboard allows you to quickly get more details on device status.

### 3rd-party Support

iCAP can also monitor devices of other brands as long as it runs Innodisk storage components.



### DRAM Monitoring

iCAP supports DRAM monitoring, providing the user remote access to iSMART DRAM information and module prediction.

## System Requirements

### Web Service

Web browsers that supports HTML5, CSS3, JavaScript:

Microsoft Internet Explorer 10+ | Google Chrome:9.0+ | Firefox:15.0+ | Safari:5.1+

### Server

Hardware Minimum Requirements:

Intel® Core™ i3 2.3 Ghz CPU or above | 4 GB RAM | 20 GB root partition for the system | 100 GB data storage

Operating System:

Ubuntu 14.04+ | Docker 17.03+

### Agent

Hardware:

Bundled with Innodisk Storage products

Operating System:

Windows 10/8.1/7/XP kernel 32/64-bits | Ubuntu 16.04 64-bits | Debian 8 64-bits | Others by request

# Successful Story



## Ensuring Safety Through Customization

Tailor-made mSATA SSD and Optimized DRAM for MRI Machines and NMR Equipment

### Situation

Anti-magnetic components are required if systems or devices are placed directly in the magnetic field present near MRI and NMR equipment. Safety becomes a major concern because, where extreme magnetism is present, even a small amount of magnetic response can cause catastrophic failures and injuries. To address these concerns, a client requested Innodisk to provide custom products with non-magnetic components.

### Challenges

1. The PCBA design must only include non-magnetic components
2. The unwavering device stability needs to be unaffected by the use of alternative parts
3. Effective monitoring of equipment and predictive maintenance are crucial features

### Solutions

1. Redesign of the SSD schematic and removal of magnetic components
2. DRAM and storage devices manufactured under strict quality standards
3. Innodisk's exclusive iSMART tool for efficient device health monitoring

### Our Roadmap to Success

#### 3ME4 mSATA SSD

- 128 GB of capacity
- Industrial-grade MLC flash
- Customized hardware that ensures that there is no magnetic response by any of the components

#### 1866 DDR3 SODIMM

- 4 GB of capacity
- Industrial-grade design

### Result

Even with the difficult conditions laid out by this application, the client achieved its design goals with Innodisk's tailor-made SSD design and DRAM modules optimized for stable and secure device operations. Combined with Innodisk's exclusive iSMART tool for seamless device monitoring, this solution provided the client with an easily-integrated solution that avoids the dangers of magnetic interference.



## Smart Nurses' Station Monitoring Systems

Patient Care and Nursing Cart Monitoring Through iCAP™ Integration for Nurses' Stations

### Overview

A client realized that their traditional way of running nurses' stations was inefficient and demanded a lot of manual work from their staff. In response, they reached out to Innodisk to give their nurses' stations a smart and connected upgrade. One of the key requirements with the new smart nurses' station is that it should make it easy to not only monitor patient status but also keeping tabs on critical equipment around the medical service facility, such as smart medical carts, across parameters such as battery life and component health

### Challenges

1. The user interface must be intuitive and user-friendly for quick and easy operation by all nursing staff
2. The nurses' station needs to collect critical battery and component information from the facility's medical carts
3. The new platform must support real-time notifications to deliver timely status updates about patients and medical equipment

### Solutions

1. Innodisk's iCAP platform provides an intuitive dashboard with user-friendly management features ideal for the upgraded nurses' station
2. The iCAP client collects pertinent battery and device information through serial ports for instant access through the nurses' station
3. iCAP's dashboard allowed integration with bedside care systems to trigger automatic alerts when patients press the help button

## Our Roadmap to Success

### Customized iCAP Platform for Healthcare Applications

- Easy-to-use dashboard available from anywhere, including off-site
- Comprehensive device information to make sure that all equipment is running normally and not at risk of breaking down
- Customizable for monitoring of other healthcare equipment and their pertinent parameters
- Excellent security for safeguarding critical information and mitigating the risk for security breaches

### Result

With Innodisk's intelligent cloud monitoring solution, the new smart nurses' stations allowed staff to quickly and seamlessly access important patient and equipment data, reducing the need for manual work and inspection. Thanks to Innodisk's customizations, the iCAP platform helped the client gather information on all their equipment, thus vastly simplifying equipment management and maintenance.

## Our Vision

# Absolute Integration™

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Absolute Integration™ is our envisioned path that moves toward a more interconnected world.

“To us, integration is not merely the combination of hardware, software and firmware; it is a philosophy that assimilates all relevant elements to create an optimal solution.”

### Headquarters

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