Digital Transformation:
Optimizing the Operating Room for Surgical Excellence
Preface

The hospital operating room is the most critical and complex service-delivery environment in healthcare. To enhance OR efficiency and improve patient outcomes, we aim to integrate pre, intra-, and post-operative processes across medical departments. Our vision is to streamline and simplify the OR environment by utilizing advanced technologies.

Optimizing surgical preparation and terminal cleaning processes is essential to reducing contamination and complication rates. Equally as important, however, is the collection of real-time data for integrated analysis and clinical decision-making. By deploying networked high-performance systems with advanced imaging and precision monitoring capabilities, hospitals can revolutionize clinical OR applications, hospitals can transform conventional ORs into intelligent ORs of the future.
About Advantech iHealthcare

Founded in 1983, Advantech is a leading provider of intelligent IoT systems and computing platforms. For many years, our Intelligent Healthcare division has supplied a wide range of certified computing systems to the world’s largest medical technology providers. We offer a comprehensive portfolio of medical-grade products, dedicated R&D teams focused on healthcare technologies, extensive customization capabilities, and global sales with localized customer service. To ensure safe operation for medical applications, our products are certified to EN/UL60601-1 and ISO 13485 standards. This certification accelerates the development and verification of new products, guaranteeing systems integrators and solution providers a rapid time-to-market.
Rapid and continuous development of IT has revolutionized the entire medical field and accelerated the rise of intelligent healthcare. Advantech’s iHealthcare division assists critical-care hospital teams by establishing patient-centered treatment environments that are equipped with the innovative technologies and platform devices for delivering high-quality patient care.

Reliable OR Solutions for **Exceptional Care**
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Our Advantage

Over the past 20 years, we have collaborated with leading equipment manufacturers and systems integrators around the world. We are a globally trusted partner committed to excellence and innovation. Our aim is to help healthcare providers strengthen their core competencies by delivering advanced solutions that can be easily deployed, integrated with existing equipment, and flexibly expanded for future healthcare applications.

Purpose-Built Medical Systems

We offer a wide range of high-performance computing systems and imaging technologies specifically designed to support critical healthcare and OR applications.

Integrated Software Deployment

Our user-friendly and scalable solution suites support OR digitalization, allowing video streaming, management, and reporting across the entire surgical process.

Global Customer Service

Advantech global service network offers localized logistics, sourcing, repairs and upgrades, technical support and training, as well as peripheral integration and design-to-order services.

Consultation and Management

Our dedicated team provides consultation and technical advice throughout the digital transformation journey, delivering bespoke solutions that improve hospital workflows.

Certified Turnkey Solutions

We work with certified system integrators and worldwide channel partners to demonstrate proof of concept and quickly provide turnkey solutions that meet customer needs.
Versatile Features for Diverse OR Needs

General OR

General surgeries can involve a range of simple to complex procedures. The AVAS-60E Video Mobile Workstation provides a solution that instantly transforms general OR into digital OR. Featuring integrated video and audio management, recording, and broadcasting capabilities, this mobile workstation allows effortless multitasking to optimize efficiency.

Integrated OR

The AVAS series are designed to optimize OR management by combining surgical capabilities with advanced imaging modalities for intra-operative monitoring and diagnosis. By introducing real-time imaging capabilities into the OR, AVAS solutions can enhance surgical precision and OR workflows to yield superior outcomes for both patients and hospitals.

OR Broadcasting

Live broadcasting of surgical procedures for consultation and educational purposes is a crucial function for hospitals. Advantech’s iVideOR is built to simulate in-person interactions in the operating room for private broadcasting across secure hospital networks. Using the multi-view feature, conference participants can simultaneously view different angles of the procedure.

Recovery Unit

Medical-grade computing systems monitor patient vital signs and compare collected data against electronic health records. With live data streaming and video integration, centralized monitoring of recovery units can be conducted remotely to streamline hospital workflows and improve operational efficiency.
Advantech’s AVAS solutions provide advanced video archiving and streaming capabilities for intelligent OR operations. The latest addition to the impressive lineup is the AVAS-60E mobile video integration workstation. Featuring an AVAS-200 series IP-based NDecoder for seamless data transmissions, AVAS-400 imaging hub with software development APIs for customizing video and imaging streams, and iVideOR software platform for integrated OR video management.

OR Video Management

iVideOR

Experience the ultimate convenience with Advantech’s iVideOR operating room video management and editing software platform. Designed to simplify the medical video management process, iVideOR allows healthcare professionals to live stream surgeries, record procedures, and manage captured video data from a centralized location. With the inclusion of video-over-IP technology, image sources can be routed to specific destinations without needing to disconnect/reconnect equipment or interrupt procedures, optimizing pre-op to post-op workflows for enhanced patient care.

Video Streaming Solutions

Advantech’s AVAS solutions provide advanced video archiving and streaming capabilities for intelligent OR operations. The latest addition to the impressive lineup is the AVAS-60E mobile video integration workstation. Featuring an AVAS-200 series IP-based NDecoder for seamless data transmissions, AVAS-400 imaging hub with software development APIs for customizing video and imaging streams, and iVideOR software platform for integrated OR video management.
Medical Boom Arm Carts
AMiS-90

Featuring an ergonomic boom arm with dual PTZ cameras and motorized height adjustment, the AMiS-90 medical boom arm cart provides a real-time surgical tele-mentoring platform for remote care delivery. The flexible boom arm allows the camera to be positioned at the optimal height and angle for improved ergonomics and space utilization. By maximizing accessibility and flexibility, AMiS-90 can streamline workflows and enable a more functional OR environment.

All-in-One Medical Computers
POC Series

Designed for healthcare applications, the POC series are fanless all-in-one computers certified to medical safety standards (UL60601-1, EN60601-1, and IEC60601-1). Suitable for deployment as information displays or control dashboards, POC terminals can be flexibly integrated with existing OR equipment to provide real-time data for critical decision making.

Surgical Displays
PAX Series

PAX series surgical monitors feature multiple I/O, analog and digital interfaces, as well as a loop-out function for multiple display systems ensuring high connectivity for diverse healthcare applications. Plus, with Advantech’s Design-to-Order service, the display size, color, and form factor can be customized according to specific needs.
### OR Video Management Architecture

**Extensional Applications**
- **NAS** (iVideOR server and PostgreSQL database)
- **PACS** (upload images in DICOM format)
- **HIS** (synchronize surgical and patient data)
- **Wi-Fi AP** (optional)

**Management Systems**
- **Personal computer** (video editing platform)

**Signal Dispatch**
- **OR**
- **AVAS-402** (video recording and dispatching platform)

**Encoder/Decoder**
- **AVAS**

**Signal Input/Output**
- **HDMI**
- **DVI**

**Fiber optic networks** allow real-time video streaming and dispatch over LAN/WAN.

**Communicate with iVideOR via web API** for video traffic and routing management.

**Scalable conversion of video signals between IP**

**Office**

**Control panel**

**Giga LAN**

**Master node**

**10GB switch**

**Fiber optic network**

**Communicate with iVideOR via web API**

**Signal Input/Output**

**Vital signs monitor**

**PACS imaging**

**Surgical camera**

**Endoscope**

**Display panel**

**Capture card**
Innovation for better healthcare outcomes
All-in-One OR Video Recording Solution

iVideOR.Lite

iVideOR.Lite Function List
- Access surgery information
- Live preview images
- Configure image colors
- Record video
- Bookmark video
- Capture image snapshots
- Apply WHO surgical safety checklist
- Embed external applications
- Upload to DICOM
For managing critical patient data and medical imaging during surgery, all-in-one (AiO) computers are ideal due to their compact design, integrated components, and compatibility with medical software technologies. Designed for OR deployment, POC-6 and POC-8 series AiO computers provide reliable platforms for streamlining workflows to improve surgical decision-making and outcomes.

POC-6 Series
Intel® Core™ i5/i7

POC-8 Series
Intel® Core™ i7/i9

4-Channel 4K30 HDMI Capture Card
2-Channel 4K60 HDMI2.0 Capture Card
T1000 Graphics Card
RTX3000 Graphics Card
OR Video Management Solutions

iVideOR

Transform surgical imaging with a futureproof OR video management and editing platform

- Input surgery information (patient lists)
- Editable content fields

- Select layout from established presets
- Create custom layouts
- Dispatch image sources
- WHO Surgical Safety checklist

- Capture video and images during surgery
- Configure layout and image sources live

Surgery information

Image management

Operation/Recording

Management
Maximize Operating Room Efficiency
Streamline workflows by simplifying OR setup, equipment configuration, and image/video capture with direct export to USB storage, PACS, and NAS.

DICOM Imaging Support
Capture screenshots during operation and the post-operation video review and archive content to PACS with single-click uploads.

Convenient Cross-Platform Data Access
Clinical data, medical imaging, and test results can be easily accessed at any time from a networked computer.

Real-Time Communication and Content Sharing
Live video streaming and real-time communication enables remote collaboration and support from specialists.

• Edit recorded video
• Upload images to PACS in DICOM format
Video Archiving and Streaming
Digitally Transform OR with AVAS Systems

AVAS Solution Architecture

- Remote PACs Access
- Multi-View Management
- Real Time Video Processing and Streaming
- View Sharing and Data Access Control
- Integrated Mobile Surgical Station
- Multi-Room Real Time Streaming and Management
- Consultation and Education
AVAS-60E is a mobile video workstation that integrates a boom arm, AiO computer, surgical monitors, cameras, speakers, and intelligent power system to provide a total solution for video archiving and streaming in ORs.

**Integrated Mobile Video Workstation**

**AVAS-60E**

**PTZ Camera**
- Resolution: FHD
- 12x/30x optical zoom

**Dual Display**
- 24” (FHD)
- 27” (FHD or 4K)

**Main Stand**
- Electromechanical height adjustment (180 ~ 260 cm)

**Boom Arm**
- (134 ~ 170 cm)

**Boom Camera**
- Resolution: 4Kp60
- 30x optical zoom

**Control Panel**
- Video controller
- Video recorder

**System Cabinet**
- For ND coders, switches, power adapters, etc

**Battery System**
- Battery type: Lithium-ion
- Battery capacity: 420Wh

**OR of the Future**

**OR Before**

- Shoulder-mounted camcorders
- Cable clutter
Surgical and Clinical Displays
PAX Series
Touchscreen

- Easy operation
- Integration
- Multiple I/O
- Glorious imaging
- 1.07 billion colors
- Enhanced EMC
- Wide compatibility
- Resolution
- FHD and 4K support

**Surgical Displays**

PAX-3 Series | 24/27/32/55”
For examination, navigation, and surgical applications

**Clinical Displays**

PAX-1 Series | 21/24/27”
For general, clinical, and laboratory applications
Enhanced EMI protection ensures compatibility with standard integration equipment and tools.

Medical-grade power adapter with EFT Immunity.

Multi-layer PCBA with ESD & EMI Protection+

I/O cover to reduce risk of ESD events.

Plastic insulation layer with ESD & EMI Protection+

Range of Display Sizes for Optimal OR Deployments

- 21" FHD
- 24" FHD
- 32" FHD/4K
- 21" FHD
- 24" FHD
- 27" FHD/4K
- 21" FHD
- 24" FHD
- 27" FHD/4K

Enhanced EMI protection ensures compatibility with standard integration equipment and tools.

PAX series monitors have enhanced red color saturation that increases the available contrast range for high-contrast imaging. The monitors also feature multiple I/O for effortless integration with diverse OR equipment.

Touch screen with AR/AG/glass surface treatment options.

Healthcare professionals

Monitors
Adaptable and Flexible
In-Wall Mount Solutions

Interactive Display Panels
- Available in 21/24/32/55”
- P-CAP touch control
- DICOM preset
- Multi-view PIP/PBP/Quad
- HDMI/DP/DVI/SDI inputs
- Simple in-wall mounting kit
- Medical-grade certification

Workstations/Control Panels
- Available in 21/24/32/55”
- Windows/Linux/Android OS
- LAN, Wi-Fi, and COM connectivity
- P-CAP touch control
- DICOM preset (optional)
- Simple in-wall mounting kit
- Medical-grade certification
Futureproof OR Monitoring and Management

Patient Data Monitoring System
Monitor patient vital signs and anaesthesia response throughout surgical procedures

OR Workstation
Access and update patient information, health records, and lab results

Telementoring Solution
Employ video conferencing for remote guidance and real-time feedback
Enabling Medical AI

High performance medical computers play a crucial role to enable AI in surgery by providing the necessary computational power, and resources for processing large amounts of surgical and medical data in real-time.

**USM-500 Series**
- 13th Gen Intel® Core™ i3/i5/i7 processor with 10 years longevity
- NVIDIA-certified with support for NVIDIA RTX A6000 GPUs
- 4 x PCIe expansion slots for integrating add-on, graphics, data capture, and LAN cards
- Medical-grade design

**POC-8 Series**
- 13th Gen Intel® Core™ i5/i7/i9 processor
- Easy expansion with NVIDIA® MXM T1000/RTX3000 graphics module or data capture cards
Video-over-IP Streaming Boxes

AVAS-60E

Integrated Mobile Video Workstation

AVAS-2

Video Recorder and Management Server

AVAS-4

Medical Computers

USM

POC
### Regional Service and Customization Centers

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<thead>
<tr>
<th>Country</th>
<th>City</th>
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<tbody>
<tr>
<td>China</td>
<td>Kunshan</td>
<td>86-512-5777-5666</td>
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<tr>
<td>Taiwan</td>
<td>Taipei</td>
<td>886-2-2792-7818</td>
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<td>Netherlands</td>
<td>Eindhoven</td>
<td>31-40-267-7000</td>
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<tr>
<td>Poland</td>
<td>Warsaw</td>
<td>00800-2426-8080</td>
</tr>
<tr>
<td>USA</td>
<td>Milpitas, CA</td>
<td>1-408-519-3898</td>
</tr>
</tbody>
</table>

### Asia Pacific

#### Taiwan
- Toll Free: 0800-777-111
- Taipei & IoT Campus: 886-2-2792-7818
- Taichung: 886-4-2372-5056
- Kaohsiung: 886-7-392-3600

#### China
- Toll Free: 800-810-0345
- Beijing: 86-10-6298-4348
- Shanghai: 86-21-3632-1616
- Shenzhen: 86-755-8212-4222
- Chengdu: 86-28-8545-0198
- Hong Kong: 852-2720-5118

#### Korea
- Toll Free: 080-363-9494/5
- Seoul: 62-2-3660-9255

#### Singapore
- Toll Free: 65-8442-1000

#### Malaysia
- Kuala Lumpur: 60-3-7725-4188
- Penang: 60-4-537-9188

#### Thailand
- Bangkok: 66-02-2483006-9

#### Vietnam
- Hanoi: 84-24-3399-1155
- Ho Chi Minh: 84-28-3836-5856

#### Indonesia
- Jakarta: 62-21-751-1939

### Europe

#### Netherlands
- Eindhoven: 31-40-267-7000
- Breda: 31-76-523-3100

#### Germany
- Toll Free: 00800-2426-8080/81
- Munich: 49-89-12099-0
- Düsseldorf: 48-2103-97-855-0

#### France
- Paris: 33-1-4119-4666

#### Italy
- Milan: 39-02-9544-961

#### Sweden
- Stockholm: 46-0-668-86-76

#### Poland
- Warsaw: 48-22-31-51-100

### Americas

#### North America
- Toll Free: 1-888-576-9668
- Cincinnati: 1-513-742-8895
- Milpitas: 1-408-519-3898
- Irvine: 1-949-450-3500
- Ottawa: 1-815-433-5100
- Chicago: 1-866-576-9668

#### Brazil
- Toll Free: 0800-770-5355
- São Paulo: 55-11-5992-5367

#### Mexico
- Toll Free: 1-800-487-2415
- Mexico City: 52-55-6275-2777