
Tempus ALS monitor/defibrillator system with IntelliSpace Corsium
Tempus ALS system in a modular form-factor

Imagine not having to carry a 20+ lbs. monitor to scene. With Tempus ALS you don’t need to.

Tempus ALS is a modern approach to prehospital monitoring and defibrillation. Designed to empower caregivers to focus on the patient and not be distracted or burdened by the equipment they need to use, the modular Tempus ALS system is comprised of a Tempus Pro monitor and a Tempus LS-Manual professional defibrillator.

Each device can be used to perform its monitoring or therapy functions separately – but devices connect wirelessly when together to share data. With two systems working as one, Tempus ALS provides a unique solution for emergency medical providers.

The Tempus Pro monitor can be carried on a shoulder strap, while the Tempus LS-Manual defibrillator is small and light enough to be stored in a first-in bag. This helps reduce potential risks associated with carrying bulky equipment to scene and keep critical life-saving equipment protected and accessible.

Offering handling benefits and also keeping your critical therapy device protected and always on-hand, the Tempus ALS provides a powerful system, that can be deployed across various emergency response vehicles.

In use, the Tempus ALS’ dual-screens allow for greater visibility. In resuscitation cases one display is focused on defibrillation therapy and the other on patient monitoring, while additional data entry opportunities help capture rich event-driven data.

With reliable transmission, data can be viewed in a user-friendly format throughout the patient journey without the need for additional software on a PC, tablet or smartphone.

Using exclusive data communication technologies, Tempus ALS allows for real-time streaming of vitals, waveforms and images to Philips IntelliSpace Consoles web-based clinical dashboards.

Designed with powerful security protocols, Tempus ALS with IntelliSpace Consoles data management provides interactive ECG measurement, diagnosis and two-way communication. Seamless electronic Patient Care Record (ePCR) integration supports improved accuracy of records and patient care transfer. Clinical and operational dashboards can simplify and support scalable deployment and utilization.

**Empowering a new approach to emergency response**
Advanced monitoring and resuscitation in a compact, modular form-factor

**Tempus Pro Monitor**

**Compact and lightweight**
Standalone size: 10.3” wide x 8.5” high x 3.9” deep
Standalone weight: 7 lbs. nominal including battery and printer, excluding IP module and accessories (without printer 6.4 lbs.)

**Color Display**
Color 6.5” 640x480 pixels, 130 Klux daylight readable display

**On-Screen Trends & Events**
Graphical and tabular format for all vital signs parameters TCCC data capture format. Summary record of care of drugs, fluids, therapies and interventions provided

**Enhanced Data Service (EDS)**
EDS is a proprietary and secure data transfer protocol, which is unique to Tempus Pro. It reduces risk of patient data loss caused by poor signal strength when transmitting data

**Advanced features**
Integrated Camera and 4.3” thermal printer, plug-in Ultrasound and Video Laryngoscopy

**Long-life battery**
At least 10.75 hours Li-Ion battery with a display brightness of 60%

**Extended secondary display**
Up to 6 waveforms can be displayed to an android tablet via Corsium Crew app where available

**Smart Mount**
Docking and charging station compliant with ground and air (fixed and rotary wing) vehicles

**Tempus LS-Manual Defibrillator**

**Compact and lightweight**
Standalone size: 7.9” wide x 6.5” high x 2.8” deep, (excluding rear clip)
Standalone weight: 4.3 lbs. with battery (without accessories)

**Easy to Use**
Connects wirelessly to Tempus Pro Monitor when in use

**Data flow**
All resuscitation data automatically flows in to the SRoC

**Biphasic waveform**
Trusted high performance BTE biphasic waveform

**Long-life battery**
At least 300 shocks at 200J from a fully charged battery or >12 hours

**Mounting solution**
Docking and charging station for all types of vehicles

7 lbs.

4.3 lbs.
Advanced capabilities to help support clear and documented decision making

A platform for growth

The Tempus ALS was designed with growth in mind to help accommodate your needs and budget. By adopting universal technology standards and connectors, the Tempus ALS is built to evolve along with your needs.

USB and wireless interfaces allow for expanded monitoring and diagnostics, without having to manage separate devices, such as a video laryngoscope or an ultrasound device and displays. Moreover, the proprietary communication technologies mean data can be stored, viewed and shared in alternative ways.

Ultrasound and vascular examinations

An optional plug-in ultrasound transducer can be used to extend the capabilities of the Tempus Pro platform to provide basic ultrasound assessment when a detailed, high quality image is not required.

- 3.5 MHz ultrasound probe for general purpose
- 7.5 MHz ultrasound probe for line placement and vascular examinations
- Automatic creation of a FAST exam report for automatic inclusion in the record of care
- FAST exam report can be transmitted in real-time or post event

Video Laryngoscopy

An optional plug-in Karl Storz-C-MAC® video laryngoscope imager can be used to give video laryngoscopy support during airway management.

- A range of disposable Macintosh and D-blades are available to enable video laryngoscope images to be visualised on the Tempus Pro display
- View vitals, including capnography and SpO2 while intubating the patient
- Still images can be captured and automatically included in the record of care
- Still images can be transmitted in real-time or post event
Philips IntelliSpace Corsium
Real-time rich data transfer and two-way communication to help empower clinical decision

Philips IntelliSpace Corsium is a web-based software platform that unlocks the power of the Tempus ALS. With the ability to capture rich levels of on-scene clinical and patient data, IntelliSpace Corsium allows Tempus ALS users to quickly share data and collaborate.

Using proprietary encryption and data transmission technologies, rich event driven clinical data, including vitals and images, can be securely shared in real-time and reviewed for two-way consultation, enabling rapid clinical and transport decision support and helping provide seamless ePCR integration.

Benefits

- Supports confident on-site diagnosis.
-Contributes to improved patient contact and experience.
-ePCR integration simplifies patient care transfer.
-Supports transport decisions.
-Better visibility of data for more efficient queue management.
-Helps improve accuracy of patient record.
-Lessen the burden of collecting and processing patient data.
-Supports efficiency in resource deployment.
-Upgradable hardware platform to optimize your investment.

Clinical | Operational | Financial
Meet increasing demand
Transport to specialized or primary care
Key patient physiological and event data in real-time
Empower clinical decision making
Measure quality of care
Over the air configuration
Optimize and streamline patient care
Event synchronized physiological data
Patient care transfer and ePCR integration are seamless

You are expected to make important decisions every day, every minute. Whether you’re a field medic seeking medical guidance, an operations manager deploying equipment across a system or a medical director understanding a clinical challenge, IntelliSpace Corsium is here to help support your clinical decisions with rich data and clear guidance.
**Tempus ALS with IntelliSpace Corsium**

**Multiple benefits for different stakeholders**

<table>
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<tr>
<th>Challenges</th>
<th>Tempus ALS and IntelliSpace Corsium solution</th>
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<tr>
<td>Manual handling issues</td>
<td>Modular system: 7 lbs. monitor for shoulder carry and 4.3 lbs. professional defibrillator in a medical response bag, only taking up a small amount of space.</td>
</tr>
<tr>
<td>Clinical decision support</td>
<td>Rich, event-driven data collected, time-synchronized to patient physiological data. Secure two-way transmission enables quick review and decision support. Ability to extend the capabilities to plug in USB and video laryngoscopy.</td>
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<tr>
<td>Reliability</td>
<td>The Tempus Pro is IP66 rated and tested to high durability standards. It is the monitor of choice for a number of militaries across the globe with reputation for reliability and robustness. Tempus LS-Manual is small enough to live in a medical response bag, where it remains until required and connects wirelessly with the Tempus Pro when in use.</td>
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<tr>
<td>Clinical decision making</td>
<td>Time-synchronized physiological data is collected automatically and augmented with manual event-driven data collected directly on the monitor. All data can be streamed directly via a web browser for quick review and into ePCR. No double documentation needed. When using in resuscitation cases, one display is focused on defibrillation Tempus LS-Manual therapy and the other on patient monitoring (Tempus Pro). Improving visualization of events – enables a caregiver to focus precisely on the care with minimal distraction. All resuscitation data is automatically captured, transmitted and easily exported into ePCR.</td>
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<tr>
<td>Governance</td>
<td>Tempus ALS provides automated, time-synchronized collection of events, diagnostic assessment and patient physiological data. Along with flexible manual notation, all stamped resuscitation data can be automatically streamed into IntelliSpace Corsium for immediate review and analysis.</td>
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<tr>
<td>Data and Connectivity</td>
<td>Tempus ALS enables rich data transmission and encryption. Our data platform has been developed and tested in conjunction with military and EMS.</td>
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<td>Workflow</td>
<td>The Summary Record of Care (SRoC) can be automatically flowed into an ePCR with the IntelliSpace Corsium software. On-scene data and an accurate real-time view of patient status can be monitored directly in the Emergency Department.</td>
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<tr>
<td>Standardization</td>
<td>The Tempus ALS can be deployed into any emergency vehicle and medical response bag. Web-based data review can minimize operational down time.</td>
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**Manual handling issues**

Equipment carried on-scene is heavy.

**Clinical decision support**

Limited data transmitted for on-scene support.

**Reliability**

Equipment is damaged as used in unpredictable conditions.

**Clinical decision making**

A lot to do on-scene, limited time/capacity to deliver optimal care and complete records.

**Governance**

Record keeping can be inaccurate and documented post-event.

**Data and Connectivity**

Unreliable data transmission and comms.

**Workflow**

Patient care transfer can be a lengthy process.

**Standardization**

Need to have a standard of care across all responder vehicle types.
Specifications

**Tempus ALS** is a small, fully-featured biphasic defibrillator/monitor, designed to enable prehospital caregivers to deliver care more efficiently:

- Full range of vital signs monitoring parameters with manual, synchronized cardioversion and pacing in a small, highly robust package²
- Utilizes the widely used, low energy 200 J biphasic BTE waveform
- Small enough to enable new choices in transport and deployment
- Long battery life - 10 hours of monitoring with display at 60% brightness (Tempus Pro) and 300 shocks with maximum energy (Tempus LS-Manual)
- Water and solid object ingress protection for austere environments with rating of IP66 for defibrillator (Tempus LS-Manual)
- 30/30 mHg pressure measurement with alarms

### Manual Defibrillation

Biphasic Truncated Exponential (BTE) waveform for defibrillation and synchronized cardioversion

- 1-200 J user configurable energy levels (1-10, 15, 20, 30, 50, 70, 90, 100, 120, 150, 170 and 200 J)
- Adult and pediatric modes available
- Charge time: 9 seconds to 200 J from first charge
- Time to shock from cold start-up: ≤15 seconds to 200 J

### Defibrillator ECG Monitoring

ECG monitoring using pads or 3-Lead via Tempus Pro-compatible ECG cable

- Speed: 0.5, 1, 2 mm/sec
- Heart rate range: 30-300 bpm ±5%
- Accuracy: ±10%
- 50/60 Hz mains filter

### Defibrillator ETCO₂ Monitoring

Remote display of ETCO₂ using data from Tempus Pro

### Pacer

Fixed and demand modes provided, override feature

- 0-200 mA ±5 mA pulses
- ≥240 bpm ±5% range
- 20 ms pulse width ±5%

### Synchronized Cardioversion

Synchronizes to R wave markers displayed on-screen

- ≤60 ms from R wave peak
- Automatically reverts to asynchronous delivery after shock has been provided

### On-Screen Trends and Events

Graphical and tabular format for all vital signs parameters

Summary record of care of drugs, fluids, therapies and interventions provided

### Tempus LS-Manual¹

**Control Interface**

- Defibrillator interface is via clearly labelled buttons
- Monitor user interface is provided by a touch screen and simple graphically labelled buttons
- Displays ultrasound and video laryngoscopy images on the large color display utilizing third party ultrasound probes and video laryngoscopy accessories³

**Drugs, fluids, therapies and interventions quickly added to the patient record through the Event button on monitor**

**Monitor Alarms**

- User configurable visual and audible alarms
- Adult, pediatric and neonate settings
- Adjustable alarms ±5 dBA at 1m
- 360° alarm visible indicator lights

**Control Interface**

- Defibrillator interface is via clearly labelled buttons
- Monitor user interface is provided by a touch screen and simple graphically labelled buttons

**Printer⁴**

- High resolution 4.3” integrated thermal printer

### ECG Monitoring

- 3-, 4-, 5- and 12-Lead monitoring via standard snap-on electrodes with automatic leadset detection
- Heart rate range: 30-300 bpm
- 12-Lead acquisition³ and 12-Lead Interpretation
- Input impedance: >100 MΩ, Dynamic range: ±5 mV ac
- Frequency response: 0.05 Hz to 175 Hz ±3dB
- Acquisition Sample rate: 500 Hz
- Common mode rejection: 95 dB minimum, additional filters include mains, muscle and low and high pass
- Filter: 10 Hz, 20 Hz

### Impedance Respiration

Range: 3 - 150 BPM
- Accuracy: ±2 BPM or ±2% whichever is greater

### Pulse Oximetry

**SpO₂**

Range: 1 - 100%
- Accuracy (adults/children): no motion or low perfusion: ±2 digits 70-100%, motion ±3 digits 70-100%
- Accuracy (premature): motion, no motion and low perfusion ±3 digits 70-100%
- Signal strength indicator
- Perfusion index: ≤0.02-20%
- Response: ≤1 second delay
- Employs patented Masimo rainbow SET™ technology

**Pleth Variability Index (PVI)³**

**Pulse Rate**

Range: 25 - 239 bpm
- Accuracy (all ages): no motion ±3 digits, motion ±5 digits

### Total Hemoglobin (SpHb g/dl)³

Range: 0 - 25 g/dl
- Accuracy (adults/infants/neonates) 1 - 15 g/dl

### Carboxyhemoglobin (SpCO)³

Range: 0 - 5%
- Accuracy (adults/infants/neonate) 1 - 15% ±1%

### Non-Invasive Blood Pressure

- Accuracy: ±3 mmHg or ±2% (whichever is greater)
- Adult range: 20 – 260 mmHg
- Pediatric range: 20 – 230 mmHg
- Neonate range: 20-130 mmHg
- cuffs: neonate disposable sizes 1-5, infant, child, adult, large adult, thigh, cuff kit

### Capnometry³

**Respiration Rate**

Range: 149 Breaths Per Minute (BPM)
- Accuracy: 0-70 BPM ±1 BPM, 71-120 BPM ±2 BPM, 121-149 BPM ±3 BPM

### Microstream ETCO₂

Range: 0 - 150 mmHg
- Flow rate: 50 (42.5 ± flow ± 6.5) ml/min, flow measured by volume
- Uses Orindion Microstream™ technology
- Accuracy: ±0.38 mmHg ±2% ±0.38 mmHg ±5% of reading ±0.08% per 1 mmHg over ±38 mmHg

### Contact Temperature

2 channel YSI 400 series compatible⁶
- Measurement range: 20 - 45 °C/68 - 113 °F
- Resolution: ±0.1 °C/±0.2 °F, Accuracy ±0.1 °C

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1. Specifications
2. Optional plug-in sensor provides on-screen feedback of compressions, rate, depth and quality
3. Audible feedback and on-screen messaging is provided to ensure compliance to AHA/ERC guidelines
4. AHA/ERC guideline settings can be updated through USB with a manufacturer provided software update
5. Synchronized cardioversion and pacing in a small, highly robust package
6. Utilizes the widely used, low energy 200 J biphasic BTE waveform
7. Small enough to enable new choices in transport and deployment
8. Water and solid object ingress protection for austere environments with rating of IP66 for defibrillator (Tempus LS-Manual)
9. Long battery life - 10 hours of monitoring with display at 60% brightness (Tempus Pro) and 300 shocks with maximum energy (Tempus LS-Manual)
10. 30/30 mHg pressure measurement with alarms
11. Automatic reverts to asynchronous delivery after shock has been provided
12. Displays ultrasound and video laryngoscopy images on the large color display utilizing third party ultrasound probes and video laryngoscopy accessories
Battery and Power

Battery – Tempus LS-Manual and Tempus Pro
Rechargeable, user replaceable lithium-ion battery
Charge time: 3 hours to 90%11,12
Small size: 133 x 60.7 x 41 mm (5.24” x 2.39” x 1.62”)

Physical Dimensions

Tempus LS-Manual
Standalone size: 7.9” wide x 6.5” high x 2.8” deep, cube 142” (excluding rear clip)
Standalone weight: 4.3 lbs. with battery (without accessories)

Tempus Pro
Standalone size: 10.3” wide x 8.5” high x 3.9” deep, cube 346”
Standalone weight: 7 lbs. nominal including battery and printer, excluding IP module and accessories (without printer 6.4 lbs.)

Environment – Tempus LS-Manual and Tempus Pro
Operating temperature range: 0 °C to 50 °C
Relative humidity: 15%-95% (non-condensing) operating and storage
Altitude: -200 m to +5486 m (-656’ to +18000’),
Solid and liquid ingress protected to IP66 according to IEC60529 Standards
Storage temperature range: -37 °C to +73.3 °C
Altitude: -200 m to +5486 m (-656’ to +18000’)
Relative humidity: 15%-95% (non-condensing) operating and storage

Input/Output

Tempus LS-Manual and Tempus Pro
Medical Electrical Equipment: IEC 60601-1-1
Airborne equipment: RTCA DO-160G, 2010 section 21 cat. M
Exceeds requirements of MIL-STD-810G 1.22 m (4’), 26 drops
Crash Safety: 20 g per DO160E Sec 7.2 Type F
Vibration: MIL-STD 810G, rotary wing (UH-60 and CH-47), fixed wing (jet profile), fixed wing (turbo prop profile), composite wheeled vehicle, Ground Vehicle per EN7189
Operational shock: 40 g per MIL-STD 810G, 6 g per RTCA DO-160E

Mounts and Bags
Hard transit cases and saddle bags available
Mechanical and electromechanical mounts compliant with ground and air (fixed and rotary wing) vehicles available

IntelliSpace Corsium licence options

IntelliSpace Corsium ReachBak licence:
All medical monitoring data, vital signs, ECGs, Summary Record of Care and images are transmitted in real time
Transmits 12-Lead ECG in real time and acquires 10 seconds of all 12-Leads
Provides 12-Lead ECG analysis and measurement tools on the transmitted ECG
ECG review results can be sent back to the Tempus Pro
Tempus Pro operator can acknowledge ECG results and provide estimated time of arrival

IntelliSpace Corsium ECG licence:
Tempus Pro user can transmit 12-Lead ECGs
Provides 12-Lead ECG analysis and measurement tools on the transmitted ECG
Also transmits basic vitals recorded at the time of the transmitted ECG

Communications

Integral Bluetooth
Used for communication with the device’s accessories
Version: V2 EDR class 2

Voice Communications
Compatible with military headsets (Peltor, Liberator etc.)
Voice communications provided by an optional wired or wireless Bluetooth headset15
Voice channel is full duplex with low bandwidth utilization (12 kbps)
Voice transmitted in real-time15

Image Communications
Images received from the Tempus can be annotated with text, colors, shapes and graphics which can be sent back to the Tempus Pro18
Video transmitted in real-time18

Integrals
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1. Tempus LS-Manual is 510(k) cleared
2. Reliable data transmission (EDS) is streamed automatically during the initial assessment and transport of the patient using Enhanced Data Service (EDS) protocol. EDS is designed to ensure effective data transfer even when the underlying connectivity is poor or of low bandwidth.
3. Depending on network availability there may be a 2-3 second delay between display of the data on the Tempus Pro and display of the same data on IntelliSpace Coronary.
5. Limitations apply and contract required with relevant service provider.
6. Not yet available in the US.
8. Optional, additional feature.
9. One channel fitted as standard second channel is optional.
10. Display active 50% of the time.
11. Subject to conditions of storage and use, times are approximate.
12. Tempus switched off while charging, charging takes longer when the device is active.
13. If Proof-Of-Use only.
14. Test done without printing.
15. GPS accuracy depends on the number of satellites visible to the device.
16. If enabled.