

# Tempus Pro™ Monitoring Platform



## Tempus Pro™ Capabilities and Modular Summary

### Introduction

RDT is providing a flexible monitoring platform that can fulfil all your monitoring needs at almost half the size and weight with greater robustness and better environmental performance than even the latest pre-hospital monitors from other providers. It does this while providing four additional, powerful and completely new capability sets that no other monitors can offer.

The advanced easy to use interface, ability to bring medical expertise to the remote location for the prevention of unnecessary evacuations and enabling of early treatment, patient record data collection and sharing capabilities of the Tempus platform, as well as its ability to integrate with advanced clinical capabilities is unique.

Tempus' ease of use interface and integration of communications means bringing telemedicine on board your vessel, platform or rig is easy:

- No installation time;
- Very little training required
  - A quick-start guide is provided on the monitor too for user referral;
- Tempus is the smallest and lightest fully-featured monitor available
  - It does not take up your precious space;
  - It is portable;
- Can be taken with you outside the clinic
  - Means you can monitor with the same equipment from site, during evacuation, right to the receiving hospital;
- Tempus is fully communications-enabled
  - It can be connected to Topside support via simple i2i™ software installation.

If you are not ready for a particular capability now, you can opt to field upgrade to it in the future. Tempus gives you the ability to leverage more from your investment now and over your ownership of the product. Rather than purchasing a static monitoring device you will be procuring a dynamic platform that can evolve as your requirements and budget change. RDT will continue to enhance the offering and add new capabilities as technology changes and evolves. These new capabilities will typically be field upgradeable.

After a new capability is introduced, all **Tempus Pro** monitors will be shipped from the factory with the software embedded to enable each device to interface with the new capability set. For example, all Tempus monitors will be shipped with ultrasound software enabled so that an ultrasound probe can be plugged into any Tempus monitor and it will recognize the probe and enable the device to display the ultrasound and record it into the patient record. This applies whether you purchase the base configuration or the most advanced (fully-loaded) configuration.

### Capabilities Summary

**Tempus Pro** has 5 distinct capability sets. Tempus is designed to be a flexible platform that can evolve over the period you own the product as your budget, protocols and requirements or the technology change. This gives you the ability to leverage the maximum from your investment now and in the future. Key to the ability to deliver this is a core product that has a configurable architecture with multiple ways of interfacing to other devices and systems as well as a flexible, but very easy to operate, user interface.

**This means Tempus is the only monitor that will be able to evolve with your changing requirements, budget and technology over the time you own the product.**

The information below summarises the 5 capabilities and value proposition.

#### **1) Fully Featured Vital Signs Monitor**

- **Tempus Pro** is an advanced vital signs monitor specifically aimed at the demanding needs of pre-hospital care users. It provides a full range of vital signs monitoring parameters in a very easy to use small, light and highly robust package with a long battery life. **Tempus Pro** weighs just 2.8 kg (6.2 lbs.) with its **RapidPak™** containing Pulse Oximetry probe, 3 (or 5) lead ECG lead set and adult NIBP cuff.
  - IP66 rated solid and liquid ingress

- Fire hose for 3 minutes; talcum powder-sized particles for 8 hours;
- Exceeds requirements of MIL-STD 810G operational shock, vibration and drop
  - 26 drops all corners, edges and faces from 1.22 metres (4 ft);
- It has a truly daylight readable 6.7" glove-operable touch screen that is also extremely robust
  - withstands impact of 1.1lb steel ball dropped onto it from 4ft).



- Integral Camera

- The camera can be used to take still pictures of the patient or to transmit video in real time. All still images are recorded directly to the patient record for use at point of care, export or printing. Video images may be transmitted over a wired or wireless network when the device is being used in Telemedicine **ReachBak™** mode. Video and image transmissions are secured using FIPS 140-2 encryption.
- The camera is mounted at an angle on the rear of the device. This means that the Tempus can be set on its foot, as shown below, and the patient's head and upper torso will be in shot. This approach works with a supine casualty on the floor or when a casualty is on a litter and the Tempus is mounted in a litter mount. When transmitting video, the Tempus can be mounted to allow a supine patient to be monitored without on-going support from the operator at the point of care. Images can be annotated by topside support with text or diagrams and sent back to the Tempus user.



- Ease of Use – including **iAssist™**
  - The Tempus monitor is designed to be very simple and intuitive to use. It has a built in Quick Start Guide that covers the principles of operation of basic and advanced features, so training can take place anytime, anywhere the Tempus is deployed. As new capabilities are introduced post purchase, such as Ultrasound and Video Laryngoscopy, built-in guides will be provided via software to support their use.
  - However, for less experienced colleagues the unique **iAssist** mode provides specially designed on-screen user instructions– e.g. how to take an ECG, capnometer, pulse oximeter, NIBP and temperature.
  - In Q1 2014 a unique 12 lead ECG harness with pre-positioned electrodes will be available.

### Example screen from the Quick Start Guide



- Lithium Ion battery
  - The battery will last for 10+ hours when running all parameters and up to 12 hours with battery saving enabled;
  - Plugging in the power supply allows you to run the Tempus on mains while also charging the battery
  - All external parameters are powered by the device meaning that you do not have to worry about managing multiple batteries; the Bluetooth® ear pierce is also charged by the device when docked;
  - Gas gage on the battery enables you to check its status when the monitor is not switched on.



## 2) Patient Record Data Collection and Sharing

- Tempus has the unique capability to collect and share all vital signs – including graphical and tabular trends and 12 lead ECG recording – and images from the integral camera. This means all care givers have accurate information on patient injuries, therapies, trended vital signs, drugs and fluids;
- Tempus Pro is built with a very powerful processor; this is one of the things that enable the device to be upgraded post purchase to enable additional capabilities such as algorithms, video laryngoscopy, ultrasound etc. Patient data is visible on the device to the Tempus user for up to 72 hours (up to 50 casualties) after the record was last active and the device will store up to 3 years' worth of data and the device will automatically delete the oldest data set if necessary.
- The patient encounter record builds automatically from point of encounter to the hospital.



- The record can be shared on another Tempus monitor or on a PC as a .pdf document. It can be inserted into the patient's long term patient record;
- The patient record of care can also be transmitted and viewed in real-time via optional **ReachBak™** technology;
- Multi-patient switching for multi-casualty scenarios;
- Touch screen interface is simple and easy to use, even with a wet gloved hand, making it usable in difficult environments.

**Example of Patient Record – Side 1**

Time	08:21	08:41	09:28	09:48
AVPU	P	P	U	U
Pulse	60	60	60	60
Resp.	38	20	39	46
BP	157/70	147/70	137/70	137/70
SpO2	91	93	93	93

**Example of Patient Record – Side 1**

**Example of Patient Record – Side 2**

Time	Drugs	Dose	Route	Geo Tag
09:22	Morphine	5mg	IV	
09:29	Combat pill pack	1pack	Oral	

**Example of Patient Record – Side 2**

### 3) Modularity & Field Upgradability

- The Tempus system is a platform that can evolve with your requirements, budget and the technology over time and that can support the addition of advanced clinical capabilities. This enables the user to get more from their investment and from the display, processor and power supply that they are already required to carry for monitoring purposes;
- Advanced capabilities currently under development<sup>1</sup> are:
  - An ultrasound capability aimed at supporting field FAST Exams, extended-FAST exams, line placement and vascular examinations;



**Tempus With Ultrasound**

- Video laryngoscopy for use with difficult intubations e.g. patients wearing neck braces in the confined space of an EMS vehicle;



**Tempus with Video Laryngoscope**

- Two extra channels of invasive pressure for intensive applications and users, totalling four IP channels.
- RDT will be customer-driven to support integration with other devices and will continue to develop the product over its life to enhance the value and utility to users;

<sup>1</sup> Under development and subject to future regulatory clearance

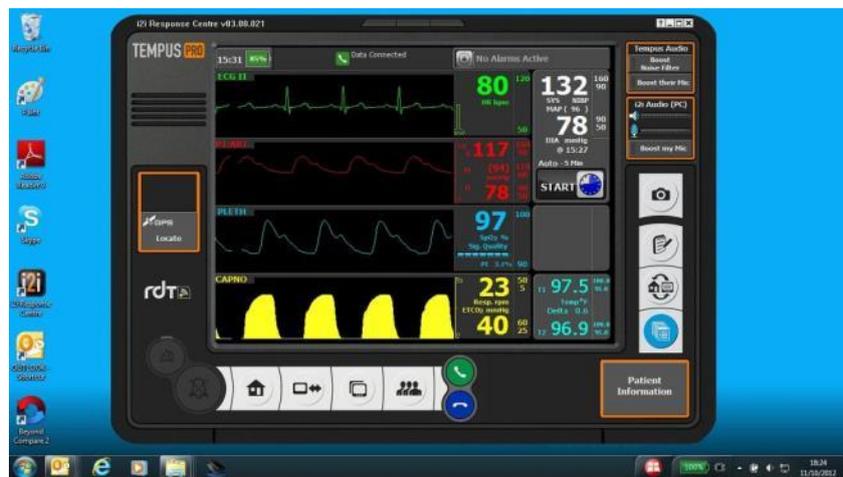
- All software is field upgradeable and most core capabilities are field upgradeable via a software update. So, for example, you can purchase the system without 12 lead ECG or without any telemedicine capabilities but you can add these capabilities purchase in the field post simply via a software update.

#### 4) Real-Time Telemedicine ReachBak™

RDT has been providing telemedicine solutions in the civilian market from remote locations including aircraft in flight for over 14 years and has hundreds of its civilian systems installed in these environments.

Tempus Pro provides full telemedicine functionality without the requirement for additional computers or devices. It can transmit all vital signs data (with or without waveforms), full duplex voice, photographs and video and the full electronic patient record, to topside support. This can be done over various communications links including civilian satcoms, Wi-Fi and GSM cell phone.

- All data including voice is encrypted to NSA FIPS 140-2 compliant cryptography;
- Tempus can connect to access points via wired connections (USB, Serial and Ethernet) or Wireless (WiFi & Bluetooth);
- Tempus can operate over very low bandwidth connections (as low as 3 kbps) and even when streaming all medical data with waveforms, full duplex voice, full patient record and video it only uses 64 kbps;
- Up to two sim cards can be inserted by the user into the device to enable connection to the carrier with the strongest signal;
- The ability to share all vital signs and patient care record in real-time allows for better informed treatment and transport decisions to be made;
- **i2i™** software used to receive Tempus calls is easy to install and configure.



**Windows PC Receiving Telemedicine Data From Tempus Pro**

#### Top Side Software Requirements

The **i2i™** (Response Centre) is a software application intended to be used to allow trained healthcare professionals to view and receive vital signs data, images and voice communications from **Tempus Pro™** patient monitors in other locations.

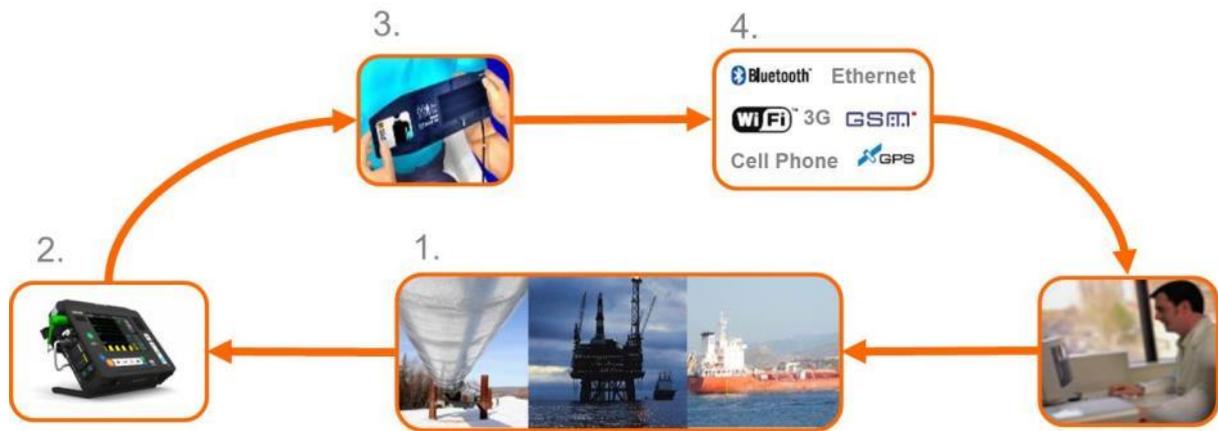
It is only used when connected to the **Tempus Pro** Patient Monitor or when viewing previously recorded data off-line and is only intended to be used by appropriately trained or qualified medical personnel.

The application should be installed in sites (offices or clinics) where trained healthcare professionals provide support to personnel in remote or field-based locations e.g. pre-hospital care, remote clinics and industrial or field sites.

The **i2i** application initiates a link to a data centre and then on to a Tempus outbound so is not normally affected by firewalls, however a list of the ports used are below.

The software application can be run on any laptop/ PC as long as it meets the minimum requirements.

- Workstations must use Windows XP SP3 or Windows 7.
- Workstations must have a minimum of a 1.8GHz processor, 1GB RAM, 20GB hard disk and a SVGA (1024x768) minimum size screen with keyboard and mouse.



1. The Location Upstream, Downstream, STASCO, Generic Shell Remote Location (e.g. Offshore, Remote Location/Extreme Remote Location and site clinic)
2. **Tempus Pro** is placed in the onsite clinic or easily taken to the patient.
3. **Tempus Pro** is used to collect and share the vital sign data
4. For **ReachBak™** telemedicine and telemonitoring purposes **Tempus Pro™** can transmit vital signs information via Bluetooth; Ethernet; Wifi; 3G; GSM; Cell phone; Satellite Phone

#### 5) Ability to Integrate With Other Devices and Software

- RDT will be responsive to user-driven requirements and will continue to expand the monitor with new software features and external peripherals that will be field upgradeable.

## Modular Summary

To support the rich set of capabilities provided above RDT offers a modular purchasing strategy.

### Baseline Configuration

This configuration includes all hardware required to support all the future upgradability and modularity described above as standard.

- NIBP with adult cuff (23 cm – 33 cm);
- 3 lead electrocardiogram;
- Masimo SET pulse oximetry SpO<sub>2</sub> with reusable sensor;
- 1 channel of contact temperature;
- Impedance Respiration;
- Integral patient record of care data capturing and export (patient details, drugs, fluids, therapies, injuries);
- Integral camera;
- USB and Ethernet wired capability and user configurable Bluetooth®, WiFi and 3G/GSM data capability
- Lithium Ion battery (10 - 12 hours; user replaceable);
- Mains power supply with cable pack;
- IP66 rated solid and liquid ingress (fire hose for 3 minutes; talcum powder-sized particles for 8 hours);
- Exceeds requirements of MIL-STD 810G operational shock, vibration and drop– 26 drops all corners, edges and faces from 1.22 metres (4 ft);
- In-field upgrade via USB for future capabilities (not capnography);
- Flat and easy to use graphic interface;
- High daylight readable glove-operable touch screen;
- Unique dual-use **iAssist™** functionality;
- Software updates as required;
- No annual maintenance.

### Options:

- Integral Oridion® Microstream® ETCO<sub>2</sub>;
- **ReachBak** (telemedicine) voice, data and video communications are all secured with NSA FIPS 140-2 approved security encryption, Response Centre install (i2i) license(s) as appropriate;
- 5 Lead ECG;
- 12 Lead Diagnostic ECG;
- 12 Lead ECG Harness (available Q1 2104);
- 2<sup>nd</sup> Channel Invasive Pressure;
- 2<sup>nd</sup> Channel Contact Temperature.

## Summary

Tempus gives you the ability to leverage more from your investment now and over your ownership of the product. Rather than purchasing a static monitoring device you will be procuring a dynamic platform that can evolve as your requirements and budget change. RDT will continue to enhance the offering and add new capabilities as technology changes and evolves. These new capabilities will typically be field upgradeable.

