

## *Wireless and Connectivity Solutions*

## *Compact, Efficient Bluetooth® Stack for Embedded Applications*



### **The Right Stack for Embedded Applications**

The TROY Bluetooth protocol stack is a full-featured Bluetooth-qualified implementation of the Bluetooth specification. It is a compact and efficient stack that is especially well-suited for OEM embedded server applications. With the addition of appropriate OEM-provided software (for example, TCP/IP and PPP for the LAN Access Profile), all of the Bluetooth standard profiles can be supported. The currently shipping protocols are:

- *Logical Link Control and Adaptation Protocol (L2CAP)*
- *Multi-Transport Object Exchange Protocol (OBEX)*
- *RFCOMM*
- *Service Discovery Protocol (SDP) (Slave)*
- *Telephony Control Protocol (TCS)*

With the addition of appropriate OEM-provided software (for example, TCP/IP and PPP for the LAN Access Profile), all of the *Bluetooth* standard profiles can be implemented. The following *Bluetooth* profiles are supported:

- |                             |                               |
|-----------------------------|-------------------------------|
| • Generic Access            | • Hard Copy Cable Replacement |
| • Generic Object Exchange   | • Audio                       |
| • LAN Access                | • Dial-up                     |
| • Object Push               | • Fax                         |
| • Serial Port               | • File Transfer               |
| • Service Discovery (Slave) | • Headset                     |
| • Basic Printing            | • Intercom                    |
| • Basic Imaging             |                               |

In addition to the above, a manager software module is included for configuration and for monitoring the operations of the stack.

The *Bluetooth* protocol stack includes a generalized operating system interface that can be easily modified to support virtually any real time operating system and micro-processor. Written entirely in ANSI C, the stack code is designed to be very modular. Only the desired functionality needs to be enabled, and unused modules can be eliminated at compile time.

User-written applications can communicate with the stack through simple well-defined APIs. The stack can support virtually any kind of *Bluetooth* baseband chip.

### **TROY Stack Advantages**

Unlike many competing products that are designed for Windows or Linux environments, the *Bluetooth* protocol stack from TROY has been designed specifically for embedded system applications. This means that it has the following advantages:

# TROY Embedded Bluetooth® Stack



## TROY Embedded Bluetooth Stack

- *Portability and flexibility.* The stack is designed to work in either an event-driven or a thread-oriented blocking environment.
- *Modular compact code with minimal resource usage.* Precious memory is saved because:
  - Memory usage is minimized via efficient programming techniques.
  - Unneeded modules can be eliminated to save additional amounts of memory.
  - Static data usage is minimized.
  - The stack can be dynamically started, stopped, and removed as necessary.
- *Parameterized memory allocation.* The stack can be readily adapted to any environment, and performance is easily maximized if additional memory is available.
- *Code Efficiency.* Stack performance is maximized through minimal context switching and minimal data copying. For maximum efficiency, the stack is a single thread implementation and there no message queues or semaphores used within the stack.
- *Driver Independence.* The stack is driver independent, with isolation of vendor-specific HCI customizations and HCI type.
- *Support for multiple HCI/RF devices.* More than one *Bluetooth* baseband/RF chip set can be used in a single device.

## Applications

Applications for the *Bluetooth* stack include industrial automation, medical instrumentation, point-of-sale, data collection, security, digital cameras, consumer electronics, and much more. The optional printing protocols make it especially well-suited for any application that requires printing.

## Support

The *Bluetooth* protocol stack includes two days of training at TROY's headquarters. TROY also offers a variety of additional support options, including telephone support, code porting, on-site training, software maintenance, and custom code development.

## TROY OEM Capabilities

TROY has the expertise to meet a wide variety of *Bluetooth* OEM needs. Our capabilities include:

- *Off-the-shelf products.* We offer a line of ready-to-run *Bluetooth* products that OEM customers can purchase at attractive discounts.
- *Private label products.* We can private label any of our standard products with your logo and artwork. In addition, we can put your name instead of ours on our management software screens.
- *Semi-custom products.* We can also sell modified versions of our products to meet your specific requirements. For example, we can provide our *Bluetooth* Print Appliance without the power supply and case so that you can embed it into your device.
- *Custom products.* For high-volume customers, we can produce custom products that meet your exact specifications.
- *Licensing.* As another alternative for high-volume customers, we can license portions our technology for incorporation into your designs.

