an introduction to
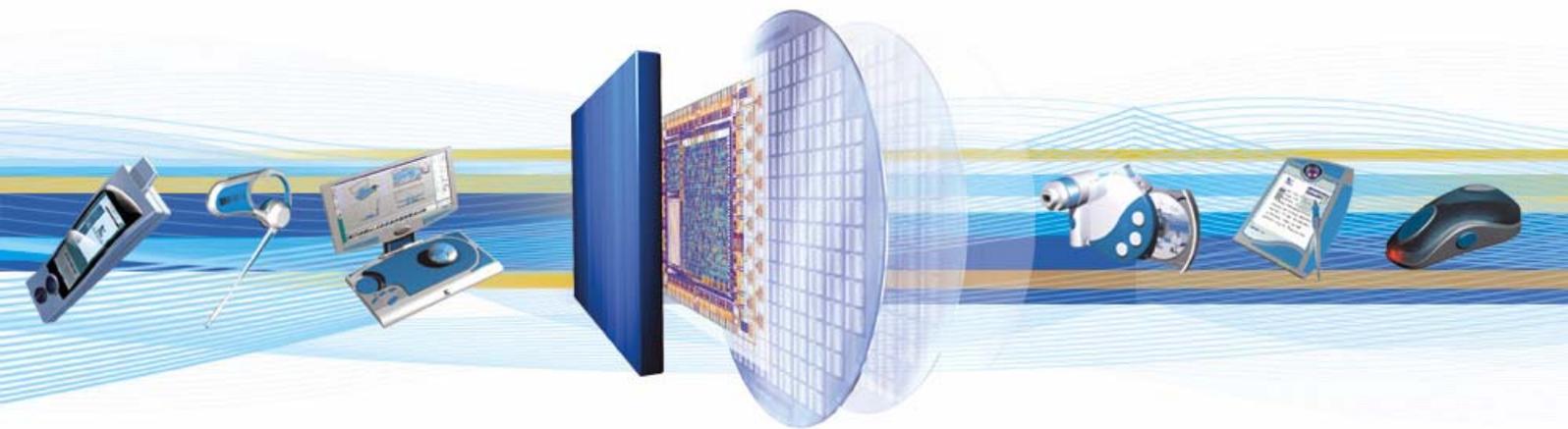
BlueLab™

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CSR

Churchill House
Cambridge Business Park
Cowley Road
Cambridge   CB4 0WZ
United Kingdom

Registered in England 3665875

Tel: +44 (0)1223 692000
Fax: +44 (0)1223 692001
www.csr.com

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1 Introduction

This document provides a brief introduction to the BlueLab™ SDK (Software Development Kit).

It describes the SDK and highlights the benefits of developing Bluetooth applications using the Integrated Development Environment (xIDE) and the reference application source code provided as part of BlueLab.

1.1 General

BlueLab provides a fully integrated development environment in which software engineers can write, compile and debug code to run in the embedded environment provided by CSR's **BlueCore™** chips.

Code is written in either:

- **ANSI C:** to run on the Virtual Machine provided by CSR's BlueCore chips.

  or

- **Assembler code:** to run on the on-chip Digital Signal Processor (DSP) of multi-media versions of BlueCore.

The application code produced by developers runs on the virtual machine (VM) provided by the firmware. The VM enables the firmware to be used as a pre-qualified component.

xIDE automatically combines developer's application code with firmware supplied in BlueLab during the build process.

The reference application and example code supplied, provides developers with a valuable resource. This source code can be incorporated directly into the developer's own code or can be used as a guide to the correct use of library functions and code structure to implement particular functionality.

1.2 Purpose

BlueLab gives programmers the flexibility to develop applications to meet individual requirements, with the option of using reference and example source code to simplify the process.

The various tools, libraries, header files, example and reference application code that make up BlueLab, provide developers with the opportunity to reduce the development overhead and time to market for new Bluetooth enabled products.

Finally, BlueLab greatly reduces the development effort required to produce working Bluetooth applications that correctly implement the required Bluetooth Profile(s).

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2 Overview of BlueLab

This chapter briefly describes the main components of BlueLab.

These are:

- xIDE, an Integrated Development Environment

- BlueCore Firmware

  Note: Whilst applications may be developed with the version of BlueCore firmware supplied with BlueLab, the final product must be built with the corresponding fully qualified firmware from CSR.

- Reference and example applications eg headset, ftp server and client applications etc

- Library and header files

- Support documentation

BlueLab must be used in conjunction with a BlueCore hardware development platform.

Various hardware development platforms are available from CSR eg Casira or the Multimedia Development Board, the type of application being developed will dictate the platform required.

Note:...Additional hardware may also be required depending on the application being developed.

2.1 xIDE

xIDE is the BlueLab Integrated Development Environment application that runs on Windows 2000 or XP platforms.

xIDE provides a familiar environment and set of utilities for programmers to develop Bluetooth applications:
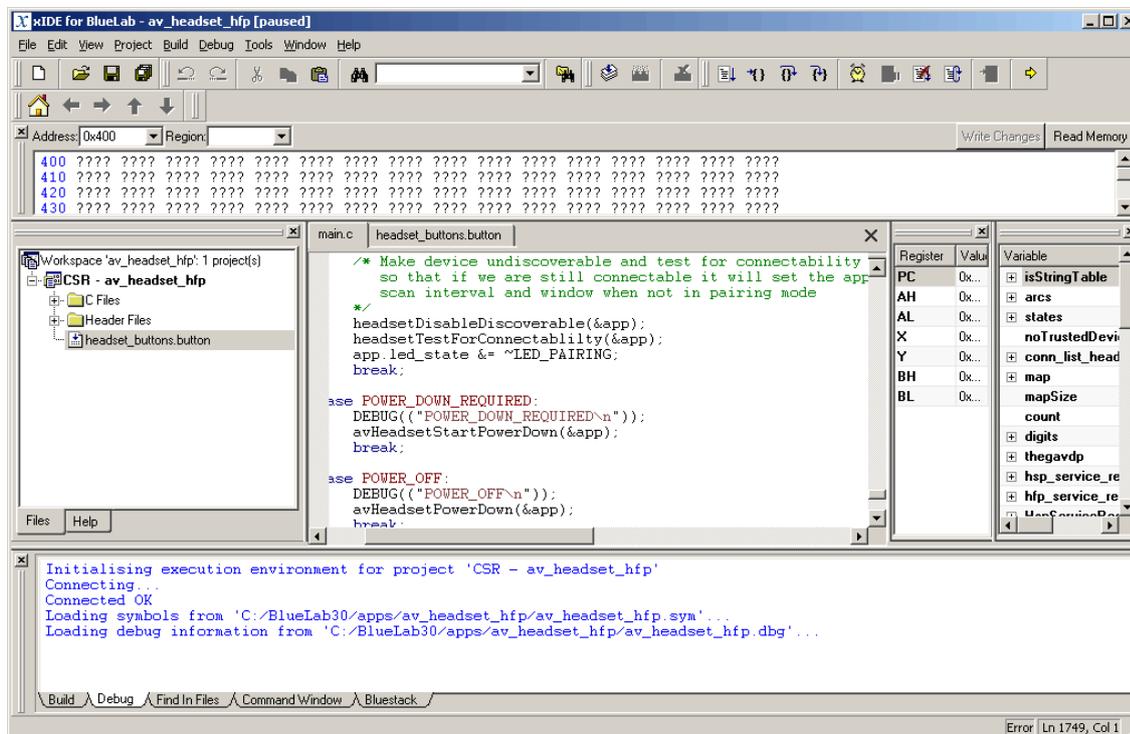
xIDE is described in more detail in the 'BlueLab xIDE user guide' (CSR reference blab-ug-002Pa).

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2.2 BlueLab Firmware

In order to allow developers the opportunity to start developing applications that take full advantage of the latest features supported by BlueCore chips, each release of BlueLab ships with development BlueCore firmware.

> **Note:** The firmware (shipped as binary code) is automatically combined with the application code when executing the Run facility in xIDE.

Shipping with development firmware gives engineers access to the latest features supported by the BlueCore chip.

However, as a result, the firmware supplied with BlueLab releases has generally not been finally qualified to the Bluetooth standard.

It is therefore essential that the final product is built with the corresponding labelled firmware ie the fully qualified version from CSR.

> **Note**: Functionality is dependent on the firmware/hardware combination.
>
> xIDE automatically detects the hardware variant and uses the compatible firmware build when compiling the application code.

2.3 Reference applications and example code

BlueLab provides reference application and example code that can be readily used and adapted by developers.

The provision of this code is a major benefit of BlueLab as it enables developers to quickly implement and customise applications, even if they are not used to working with Bluetooth technologies.

It allows the development effort to concentrate on providing the Man Machine Interface (MMI), features and functionality that will distinguish the final product, without the need to construct the underlying profiles.

Access to this code also helps software engineers gain an understanding of the how the library functions are used to provide underlying profiles.

> **Note:** The number of reference applications and examples provided is constantly being updated and added to as part of BlueLab's regular release program.

Guidance on the use of Reference applications and examples is provided in readme files within the subfolders in the apps folder:

`C:\BlueLab\apps\...` where `C:\BlueLab` is the install directory.

2.4 Libraries

BlueLab is shipped with a set of libraries including a subset of the Standard C library. The functions included are restricted to those applicable to the embedded BlueCore environment.

> **Note:** the source code for these standard C libraries is not supplied.

The libraries provide access to a comprehensive range of functions that are commonly used when developing applications.

In many circumstances, it is unnecessary to alter the code called by these functions. However, wherever possible, BlueLab makes the source code available so that developers can understand how they work, and can fine-tune the code if they wish.

In practice, the libraries are intended to be flexible and powerful enough to support almost all applications without modification whether developing a product based on a reference application or from scratch.

Further information on BlueLab libraries and their use is available in the separate publication 'a guide to the BlueLab Libraries' (CSR reference blab-ug-003Pa) and the Reference Guide provided as part of the xIDE on-line support documentation.

2.5   Documentation

BlueLab is supported by a series of standalone manuals including this one.

Currently the documents available are:

- an introduction to BlueLab (CSR reference blab-ug-001Pa ie this document).
- BlueLab xIDE user guide (CSR reference blab-ug-002Pa).
- a guide to BlueLab libraries (CSR reference blab-ug-003Pa).

These documents are further supported by:

- The xIDE on-line help documentation.
- The internally documented library header files.
- The clearly commented source code provided.
- The Release Notes accompanying each new version release.

The documentation supporting BlueLab is constantly being updated and expanded as part of an ongoing commitment to provide software engineers with the information necessary to simplify application development using BlueLab.

CSR welcomes constructive suggestions on how the documentation supporting BlueLab can be improved.

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3   Technical Support

Further information on all CSR products can be found on the technical support website
(http://www.csrsupport.com).

Developers are also recommended to view the public newsgroups hosted by CSR on the Internet news (NTTP)
server news.csr.com. The newsgroups are a convenient forum for the Bluetooth community to exchange
knowledge and are a valuable source of information.

Set up instructions and guidelines for the use of newsgroups can be found by following the links on the CSR
support website.

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Terms and Definitions

BlueCore™	Group term for CSR's range of Bluetooth wireless technology chips
Bluetooth®	Set of technologies providing audio and data transfer over short-range radio connections
Bluetooth SIG	Bluetooth Special Interest Group
Casira	CSR Bluetooth development hardware
CSR	Cambridge Silicon Radio
DSP	Digital Signal Processor: a microprocessor dedicated to real-time signal processing.
MMI	Man Machine Interface
SDK	Software Development Kit
xIDE	BlueLab's Integrated Development Environment

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Document History

Revision	Date	Reason for Change
a	28 May 05	Original publication of this document. (CSR reference: blab-ug-001Pa)

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User Guide

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