



LANTRONIX® **EVOLUTION OS®** Software Developer Kit for MatchPort® AR™

Overview The Evolution OS® Software Developers Kit (SDK) provides the ability to create custom applications to run on MatchPort AR using the Evolution Operating System. Access to a large subset of Evolution's internal Application Programmer's Interface (API) allows developers to easily enhance much of Evolution OS rich feature set for custom applications.

SDK Main Modules

The Evolution OS SDK API provides the programmer with high-level access to a large portion of the OS rich feature set. Complete documentation is provided in the Evolution OS SDK API Reference Manual for all functions, structures, definitions, etc. Some of the main modules include:

CLI Evolution OS uses a powerful Command Line Interface (CLI). The CLI is available to users over the serial ports, as well as through Telnet and SSH. It can be used for configuration, checking system status, and performing various functions available in the system. Using the SDK a developer can add custom commands to the CLI.

XML Configuration Record (XCR) A powerful way to configure the MatchPort AR running Evolution OS is with Extensible Markup Language (XML) Configuration Records (XCR). XML is human readable yet very efficient for machines to interpret. The XML engine has been designed to efficiently import and export XCRs and also provides a high degree of flexibility. XCRs can contain configuration information for the entire system, or for just a few parameters.

HTTP Evolution OS includes a standard HTTP server which supports both HTTP v1.0 and v1.1. Included in the HTTP framework is full support for CGI, Cookies, Mime Types, Statistics, Logging, RSS, Authentication, and SSL. Already implemented within Evolution OS on the MatchPort AR is a powerful Web Manager, which provides users with status information, configuration capabilities, as well as the ability to perform numerous other system functions. The Evolution OS SDK API allows users to easily expand on the MatchPort AR Web Manager by adding both static and customized CGI based web pages. A wide range of API calls are available for parsing and decoding GET query strings, URL encoded and multipart POST data.

Secure Shell (SSH) The Lantronix Secure Shell is a fully interoperable version of the Secure Shell v2 protocol to provide secure remote login and other secure network services over an insecure network. The SSH implementation API's are very much like normal Berkeley Socket API's. A variety of algorithms for key exchange, authentication, and encryption are provided.

Additional SDK APIs

The following is a sampling of some of the additional APIs included in the Evolution OS SDK:

Operating System Common OS System functions such as Semaphores, Task Creation/Suspend/Kill.

BSD Socket Programming Interface Provides standard access to protocol services including TCP, UDP, DNS.

File System Full file system with ANSI C like API. Accessible via FTP, TFTP, CLI and Web Manager.



Data Structures Includes Hash Tables, Link List, and AVL Trees.

Dynamic Memory Heap Includes Malloc, Free, Private Mbuf-like Buffer Pools

Diagnostics APIs for statistics such as Network statistics, Memory usage, File System usage and Process usage.

Email Send email messages with message bodies.

Configurable Pins Full management of MatchPort AR configurable pins.

Serial Port APIs to send and receive data via the serial ports.

Sample Programs

The Evolution OS SDK includes sample programs. Programmers can refer to these sample programs when creating their own custom applications.

Hello World.c

Uses the SDK Serial API to print “Hello World” on serial port 1.

Thread.c

Uses the serial and semaphore APIs. A new thread is created to print “Hello World” multiple times, and uses a semaphore to signal the main thread when its execution is complete. Also, all memory is dynamically allocated.

Commandline.c

Uses the command line API to enhance the CLI with some simple custom commands.

Cgi.c

Uses the web APIs to create a simple CGI based page. The sample takes a string and “translates” it into all upper case text.

Sockets.c

A simple implementation of a telnet server that translates a string to uppercase using BSD sockets.

Tunnel.c

Shows a basic tunneling application. Uses threads, sockets, serial read/write, and xml configuration.

Email.c

This sample demonstrates the use of XCR to configure the email server, and then initiate the sending of an email message through the use of the API.

Sshsample.c

Demonstrates how to establish and work with an SSH

connection.

Secureweb.c

Demonstrates SSL, CGI, and deactivating Evolutions default web manager.

Custommib.c

Shows adding custom MIB data to the standard MIB data exposed automatically by Evolution.

Cpio.c

Configuring, reading and setting the general purpose I/O pins.

Aestunnelclient.c

Demonstrates the client portion of a rudimentary tunneling application using AES data encryption.

Aestunnelserver.c

Demonstrates the server portion of a rudimentary tunneling application using AES data encryption.

Wiportdemo.c

This sample implements controls for communicating and gathering data from the Lantronix XPort/WiPort Demo board.

Readconfig.c

Demonstrates retrieving the current configuration information.

Xmlconfig.c

Demonstrates setting configuration using XML.

Other Required Tools

The Evolution OS SDK requires the CodeSourcery G++ Light or Pro Compiler tool package.

Ordering Information

Part Number

MPDK1000-01

MatchPort Developer Kit

SDK Developers Kit

A full MatchPort AR Developers’ Kit is available.

The kit includes:

- User Guide
- Integration Guide
- DeviceInstaller™ software
- SDK
- CodeSourcery Sourcery G++ Light
- CodeSourcery Sourcery G++ Pro trial version
- P & E Micro-computer systems USB Multilink
- MatchPort AR with BDM connector
- MatchPort demo board