

# LANTRONIX®

## MatchPort®



## XPort Pro™



## EDS1100/2100



# Linux Software Developers Kit (SDK) Quick Start Guide

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## Disclaimer

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

## Revision History

Date	Rev.	Comments
	A	Initial document
9/09	B	Updated
6/10	C	Updated to include EDS11/2100

For supporting product documentation, or the most current version of this document, please visit the Lantronix Web site at [www.lantronix.com/support/documentation](http://www.lantronix.com/support/documentation).

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# 1. Introduction

This Quick Start Guide explains the basics: how to connect and set up your target on the network; how to install the SDK; and how to build the firmware images. For more detailed information, refer to the User Guide supplied with this product or our Lantronix Web site [www.lantronix.com/support/downloads](http://www.lantronix.com/support/downloads).

## Overview

The Lantronix Linux Software Developer's Kit (SDK) is an embedded hardware and software suite that enables Linux developers to create applications on Lantronix' embedded networking modules.

The MatchPort AR module can be used to add networking capabilities to your device. The development board includes two RS-232 serial ports and a 10/100Base-TX network connection (RJ45).

The XPort Pro module can be used to add networking capabilities to your device. The development board includes an RS-232 serial port and a 10/100Base-TX network connection (RJ45).

The EDS1100 & EDS2100 are external device servers that can be used to add networking capabilities to your device. The EDS1100 has one RS-232 serial port and a 10/ 100Base-TX network connection (RJ45). The EDS2100 has two RS-232 serial ports and a 10/100 Base-TX network connection (RJ45).

Based on the 2.6 Linux kernel, and leveraging existing open source software, the SDK simplifies the process of adding custom applications. Device drivers, GNU toolchain, pre-defined configuration profiles, and sample applications are all included.

## 2. What's in the Box

Items included depend on which model you have.

### MatchPort

The box contains the following items:

- ◆ Ethernet cable 10 ft
- ◆ MatchPort AR Evaluation Board
- ◆ MatchPort AR Module (may have optional BDM connector)
- ◆ Antenna – 2.4GHz 2.15 dBi reverse polarity SMA
- ◆ 3.3V wall-mount power supply AC/DC, 1A
- ◆ RS-232, DB9F/F, 10ft, null modem cable
- ◆ SMA to UFL adapter cable

### EDS1100

The box contains the following items:

- ◆ EDS1100
- ◆ Cat5e UTP RJ45M/M Ethernet cable
- ◆ DB25M to DB9F serial cable
- ◆ Power Cube, 100-240VAC, with international adapters and Power Cord Restraint

### XPort Pro

The box contains the following items:

- ◆ Cat5e UTP RJ45M/M Ethernet cable
- ◆ XPort Universal Demo Board
- ◆ XPort Pro Development Board with BDM Connector
- ◆ 3.3V wall-mount power supply AC/DC, 1.2A
- ◆ RS-232 cable, DB9F/F, null modem

### EDS2100

The box contains the following items:

- ◆ EDS2100
- ◆ Cat5e UTP RJ45M/M Ethernet Cable
- ◆ DB9F to DB9F serial cable
- ◆ Power Cube, 100-240VAC, with international adapters and Power Cord Restraint

## 3. Target Setup

### Connecting the Lantronix Evaluation Board

This section describes how to connect the MatchPort AR evaluation board or XPort Pro demo board to your host computer and network.

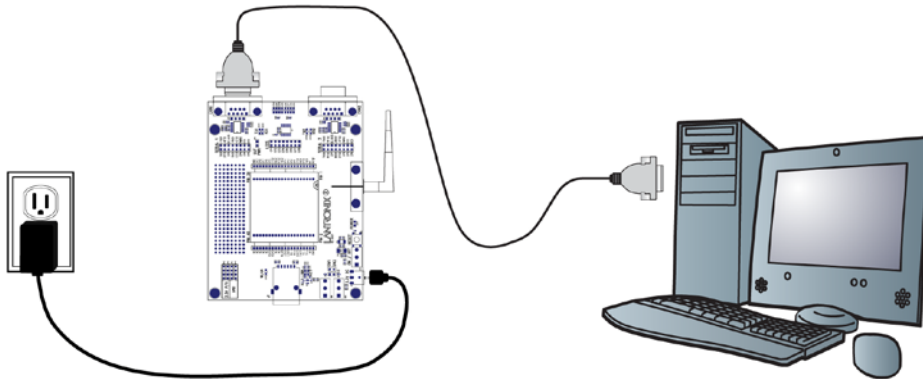
#### Connecting an Evaluation Board – Power

1. Make sure that the power switch on the evaluation or demo board is set to off.
2. Select the appropriate power plug adaptor for your geographical location. Insert it into the slot on the Universal Power Supply; then plug the power supply into an outlet.
3. Connect the output plug of the power supply to the evaluation or demo board.

#### Connecting an Evaluation Board – Serial Port

1. Connect one end of the supplied DB9F/F (DB25F on EDS1100) serial cable to the serial port on the laptop or desktop.
2. Connect the other end of the supplied DB9F/F serial cable to the serial port on the evaluation board (CON1 on MatchPort AR and EDS2100).

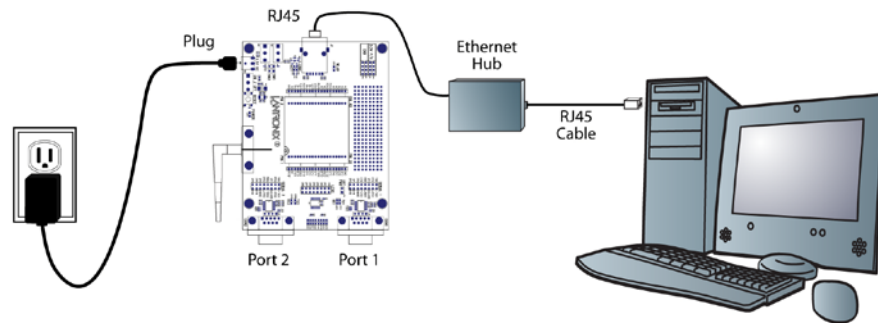
Figure 3-1. Connecting an Evaluation Board via Serial Port



## Connecting an Evaluation Board – Ethernet

**One Step** Connect the PC to the evaluation or demo board with a cross-over cable, or a hub/switch and two regular RJ45 cables.

**Figure 3-2. Connecting an Evaluation Board via Ethernet**



## Connecting the EDS1100/2100

1. Select the appropriate power plug adaptor for your geographical location. Insert it into the slot on the Universal Power Supply; then plug the power supply into an outlet.
2. Connect the output plug of the power supply to the EDS1100/EDS2100.
3. Connect one end of the supplied DB9F/F (DB25F on EDS1100) serial cable to the serial port on the laptop or desktop.
4. Connect the other end of the supplied serial cable to the serial port on the EDS1100 (CON1 on EDS2100).
5. Connect the PC to the evaluation or demo board with a cross-over cable, or a hub/switch and two regular RJ45 cables.

## Booting the Target Device

**To boot your target device (MatchPort AR, XPort Pro, or EDS1100 / 2100):**

1. From the host computer, open a terminal emulation program for the serial port.
2. Configure the following serial port settings:
  - ◆ baud rate: 115200
  - ◆ data length: 8
  - ◆ parity: None
  - ◆ stop bit: 1
  - ◆ flow control: None
3. Turn the power on.

A series of boot messages displays before the Linux shell prompt of '#' appears.



## Configuring an IP Address

By default, the target device (MatchPort AR, XPort Pro, or EDS1100 / 2100) will attempt to obtain an IP address via the DHCP protocol. Type the following command at the Linux shell prompt to determine the IP address:

```
$ ifconfig eth0
```

The ifconfig command can also be used to set an address, but it will not persist across a reboot.

To set a temporary static address, issue the following command (replace angle bracketed items with actual values):

```
$ ifconfig eth0 <target_ip_address> <target_subnet_mask>
```

### **To set a static address that persists across reboots:**

1. Use the vi text editor to edit /usr/local/etc/netcfg. (Consult a vi manual for details on using this text editor).
2. Add the following lines to the netcfg file (replace angle bracketed items with actual values)

```
IPADDR=<target_ip_address>
NETMASK=<target_subnet_mask>
GATEWAY=<target_gateway_address>
```
3. Write the changes to the file and exit the from the vi editor.
4. Issue the 'reboot' command to reset the target for changes to take effect.

## 4. SDK Installation Overview

### Host requirements

Please make sure that at least 2.5 GB of disk space is available before installation.

Some operations may require root privileges. Consult the User Guide for instructions on setting up sudo access.

### Linux Distributions

The SDK was validated on the following Linux distributions:

#### Redhat-based distributions

- ◆ Fedora 9, 10, 11, 12, Fedora Core 5 & 6
- ◆ CentOS 5.2, 5.3, 5.4
- groupinstall 'Development Tools' (installs additional development tools not necessary for the SDK) or gcc, make, glibc-devel
- python
- sudo
- libacl-devel
- tftp-server or tftpd-hpa
- libtasn1-devel
- zlib-devel
- rsync
  - ◆ Optional but recommended packages
- openssh, openssh-clients, openssh-server
- nfs-utils
- ncurses-devel (for the ncurses-based configuration utility)
- libglade2-devel (for the GTK-based graphical configuration utility)
- qt-devel (for the Qt3-based graphical configuration utility)

#### Debian-based distributions

- ◆ Debian Lenny 5.0.2 & 5.0.4
- ◆ Ubuntu 8.04, 8.10, 9.04, 9.10, 10.04
- build-essential

- python
- sudo
- libacl1-dev
- tftpd or tftpd-hpa
- libtasn1-3-dev
- zlib1g-dev
- rsync
  - ◆ Optional but recommended packages
- ssh
- nfs-kernel-server
- libncurses5-dev (for the ncurses-based configuration utility)
- libglade2-dev (for the GTK-based graphical configuration utility)
- libqt3-qt-dev (for the Qt3-based graphical configuration utility)

### Other Distributions

- ◆ OpenSUSE 11.2
  - pattern install devel\_C\_C++
  - pattern install devel\_kernel
  - python
  - sudo
  - libacl-devel
  - tftp or tftpd-hpa
  - libtasn1-devel
  - zlib-devel
  - rsync
    - ◆ Optional but recommended packages
  - openssh, openssh-clients, openssh-server
  - nfs-utils
  - ncurses-devel (for the ncurses-based configuration utility)
  - libglade2-devel (for the GTK-based graphical configuration utility)
  - qt-devel (for the Qt3-based graphical configuration utility)

#### NOTE

*If you are able to compile the Linux kernel on your host machine, you will also be able to build the SDK images.*

## Installation Procedure

### To install the SDK software on your host machine:

1. Mount the SDK CD image on your host system. The User Guide provides additional information about image mounting procedures.
2. Select and create an installation directory (replace angle bracketed items with actual values). You must have write privileges to this directory.
 

```
$ mkdir -p <install_directory>
```
3. Switch into the installation directory.
 

```
$ cd <install_directory>
```
4. Run the installation script. Use the full path to <cdrom directory>
 

```
$ <cdrom_directory>/install.sh
```
5. When prompted, type `Y` to accept the installation directory.
6. Install the directory.
 

```
[<install_directory>] ? (Y/n) : Y
```
7. Type `Y` to continue the installation process, if the following message prompts appear.

**Figure 4-1. Message Prompts**

```
You are using /bin/sh -> dash.
To use Linux SDK, you cannot use /bin/sh -> dash.
Attempt to automatically relink /bin/sh -> bash?
(y/N): y

Missing needed host development packages.
Note that sudo privileges are required for
installation.
Attempt to automatically install missing packages?
(y/N): y
```

The SDK begins the installation process on your host system.

### NOTE

*The installation process may take several minutes to complete.*

## 5. Building Images with the SDK

To build an image with the SDK:

1. From the development host, switch into the installation directory.  
`$ cd <install directory>`
2. Source the environment file.  
`$ . env_m68k-µClinux`
3. Issue the make command.  
`$ make`
4. Select a configuration profile when prompted.

### NOTE

*If you are unsure of which configuration profile to use, begin with the DEFAULT profile.*

Figure 5-1. Configuration Profile Menu

```
Configuration Profile
> 1. DEFAULT (LTRX_PROFILE_DEFAULT) (NEW)
   2. DEVELOPMENT (LTRX_PROFILE_DEVELOP) (NEW)
   3. NO_IPV6 (LTRX_PROFILE_NO_IPV6) (NEW)
   4. COMPACT (LTRX_PROFILE_COMPACT) (NEW)
   5. AUFS (LTRX_PROFILE_AUFS) (NEW)
   6. SHARED (LTRX_PROFILE_SHARED) (NEW)
choice[1-6?]: 1
*
* Kernel/Library/Defaults Selection
*
* Kernel is linux-2.6.x
*
* Libc is uClibc
*
* glibc Library Configuration
*
```

5. Press **Enter** to accept the default options for the remaining prompts.

**Figure 5-2. Configuration Prompts**

```

Default all settings (lose changes)
(DEFAULTS_OVERRIDE) [N/y] (NEW)
Customize Kernel Settings (DEFAULTS_KERNEL) [N/y]
(NEW)
Customize Application/Library Settings
(DEFAULTS_VENDOR) [N/y] (NEW)
Update Default Vendor Settings
(DEFAULTS_VENDOR_UPDATE) [N/y] (NEW)
...

```

**NOTE**

*The build process may take several minutes to complete.*

6. Once the build process is complete, verify that the images listed below are under <install directory>/linux/images/.

```
$ ls linux/images/
```

**Figure 5-3. Installed Images**

```

image.bin imageu.bin imagez.bin linux.bin linuxz.bin
image.without_header linux.without_header romfs.img
rootfs.img romfs-inst.log

```

7. Build the root file system for NFS from the installation directory.

```
$ mkdir linux/nfs
$ make
```

## 6. *SDK Forum Information*

The Lantronix Linux SDK forum Web site (<http://forums.lantronix.com>) is the primary resource to obtain updated revisions of the SDK. The SDK and related documentation are also available via the Downloads page ([www.lantronix.com/support/downloads](http://www.lantronix.com/support/downloads)). Please visit the Lantronix Web site or the Forums page to determine if a more current version of the SDK is available.

Individual forum topics are monitored by Lantronix engineers and technical support staff and may be used to ask questions regarding any aspect of the SDK. Complete the registration process to obtain a logon ID and post your question. If enabled in your user profile, you will receive an email message when a response to your post is available. Other options for interacting with the forum are described on the forum site itself.