



# Digi Embedded Yocto 1.4

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Getting Started Guide

## Revision history—90001362

Revision	Date	Description
A	September, 2013	Baseline release of the document.
B	December, 2013	Documentation changes to reflect the following upgrades: v1.4 of the Yocto Project (Dylan); ConnectCard for i.MX28 kernel to version 3.10; bootloader to DUB-2.0.
C	March, 2015	Changed sample code to account for future version changes; converted document to new format.
D	April, 2017	Updated branding and made editorial enhancements.

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## Getting Started with Digi Embedded Yocto 1.4

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Digi Embedded Yocto (DEY) supports the following Digi embedded platforms:

- ConnectCard for i.MX28 on the JumpStart kit.
- ConnectCore for i.MX51 on the JumpStart kit.
- ConnectCore for i.MX53 on the JumpStart kit.

It contains two new Yocto layers:

1. meta-digi-arm

This layer is based on **meta-fsl-arm** and contains the BSP customizations for Digi's supported platforms.

2. meta-digi-dey

This layer adds two new target images to Yocto.

- **dey-image-minimal**, a minimal busybox command line based image.
- **dey-image-graphical**, a graphical SATO (a GNOME mobile graphical environment) based image.

Both layers can be used together or independently.

# Installation

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## Setting up your workstation

Your PC workstation must be set up correctly in order to use Digi Embedded Yocto. You will find instructions regarding supported operating systems and specific OS setup in the [Yocto Online Quick Start Guide](#). Follow the instructions corresponding to your operating system before continuing.

## Installing Digi Embedded Yocto

We use the [repo](#) tool to install yocto. Download *repo* to a directory within your path and download the manifest file.

```
curl http://commondatastorage.googleapis.com/git-repo-downloads/repo >
/usr/local/bin/repo
chmod a+x /usr/local/bin/repo
```

We will assume you will run *repo* from **/usr/local/dey-1.4** (make sure you have user write permissions).

```
cd /usr/local/dey-1.4
repo init -u https://github.com/digidotcom/dey-manifest.git -b dylan
repo sync
```

## Creating a project

The available platforms in the **meta-digi-arm** layer are:

- ConnectCard for i.MX28 on the JumpStart kit, **ccardimx28js**.
- ConnectCore for i.MX51 on the JumpStart kit, **ccimx51js**.
- ConnectCore for i.MX53 on the JumpStart kit, **ccimx53js**.

To initialize the project and environment, we use the **mkproject.sh** script. For example, for the **ccimx53js** we would do the following:

```
mkdir -p $HOME/workspace/ccimx53js
cd $HOME/workspace/ccimx53js
source /usr/local/dey-1.4/mkproject.sh -p ccimx53js
```

This will initialize the project with a conf directory and two configuration files.

**bblayers.conf**: The available layers are configured here.

**local.conf**: Local configuration variables affecting only this project are customized here.

It will also set up the environment for build. The **mkproject.sh** can be safely rerun over an existing project to set up the build environment on a new terminal.

## Building images

To build the images, use one of the following commands, depending on whether you want a graphical or command line based file system.

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```
bitbake dey-image-minimal
```

or

```
bitbake dey-image-graphical
```

---

Note that for **dey-image-graphical** will need to modify the DISTRO variable in **conf/local.conf** to “**dey-gui**” by appending the following line:

---

```
DISTRO = "dey-gui"
```

---

Generated images will be found in the **<project>/tmp/deploy/images** folder.

You can then either program these images to flash or perform a network boot, using the U-Boot bootloader which was preloaded on your hardware. For details, see the U-Boot reference manual for your product on the [Digi support site](#).

## Customizing Digi Embedded Yocto

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## Adding packages to your target image

If you want to add a package to your image, for example *python*, add the following to your project's **conf/local.conf** file:

```
IMAGE_INSTALL_append = " python"
```

**Note** Include the space before the word *python*.

## Adding features to your target image

Apart from the standard Yocto features, the DEY images introduce some new features that allow for a certain degree of easy customization.

```
EXTRA_IMAGE_FEATURES = "<feature-name>"
```

Most of the features are automatically selected based on the selected machine. For example, a machine that supports ALSA will include the *dey-audio* feature automatically.

A list of new DEY features follows:

- **dey-audio:** Adds audio support to a platform.
- **dey-gstreamer:** Adds the gstreamer framework to a platform.
- **dey-network:** Adds network applications and tools. You can configure some of the network applications in your **conf/local.conf** by doing:

```
VIRTUAL-RUNTIME_ftp-server = "vsftpd"  
VIRTUAL-RUNTIME_http-server = "cherokee"  
VIRTUAL-RUNTIME_network-utils = "net-tools"  
VIRTUAL-RUNTIME_snmp-manager = "net-snmp-server"  
VIRTUAL-RUNTIME_ssh_server = "dropbear"
```
- **dey-wireless:** Includes wireless applications and drivers.
- **dey-bluetooth:** Adds bluetooth support.
- **dey-debug:** Adds DEY debugging applications as memwatch and fbtest.
- **dey-examples:** Adds DEY example applications.
- **dey-qt:** Adds QT support for dey-image-graphical.

## Advanced customization

When further customization is needed, the suggested way to customize Yocto for your specific needs is to create a new layer. An example of this is **meta-custom**. You can use it directly above **meta-digi-arm**, or you can use it to customize the Digi demo images already provided in **meta-digi-dey**.

Your **meta-custom** layer can:

- Include new recipes, for example to add new applications to Yocto that compile from source, or to add new files to the file system.
- Modify existing recipes in any other layer, by adding a *.bbappend* recipe. This can be used to modify existing files in the filesystem.
- Create a new target image.
- Create new machine configurations.
- Provide default kernel configurations or configuration fragments for your new platforms.

## References

Yocto has a complete documentation set. The following is a partial list:

- [Project wiki](#)
- [Mailing lists](#)
- [IRC channels](#)
- [Documentation](#)
- [Videos](#)