



# Seco BSP for Yocto

## Revision History

Revision	Date	Author	Changes
1_0	17 <sup>th</sup> December 2015	M.C.	First release
1_1	19 <sup>th</sup> January 2016	M.C.	Add logo customisation
1_2	29 <sup>th</sup> February 2016	M.D.M.	Jethro version
1_3	24 <sup>th</sup> January 2018	M.M.	Pyro version

## 1. Quick start

### SUPPORTED LINUX DISTRIBUTION

Yocto project is actually supported on the current release minus one of the following distributions:

- Ubuntu
- Fedora
- CentOS
- Debian GNU/Linux
- openSUSE

If you want to build your image, assure that you have at least 50 GB free in your hard drive.

### DEPENDENCIES

#### Ubuntu and Debian

```
$ sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib \
build-essential chrpath socat cpio python python3 python3-pip python3-pexpect \
xz-utils debianutils iputils-ping libssl1.2-dev xterm
```

#### Fedora

```
$ sudo dnf install gawk make wget tar bzip2 gzip python3 unzip perl patch \
diffutils diffstat git cpp gcc gcc-c++ glibc-devel texinfo chrpath \
ccache perl-Data-Dumper perl-Text-ParseWords perl-Thread-Queue perl-bignum socat \
python3-pexpect findutils which file cpio python python3-pip xz SDL-devel xterm
```

#### openSUSE

```
$ sudo zypper install python gcc gcc-c++ git chrpath make wget python-xml \
diffstat makeinfo python-curses patch socat python3 python3-curses tar python3-pip \
python3-pexpect xz which libSDL-devel xterm
```

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## CentOS

```
$ sudo yum install -y epel-release
$ sudo yum makecache
$ sudo yum install gawk make wget tar bzip2 gzip python unzip perl patch \
diffutils diffstat git cpp gcc gcc-c++ glibc-devel texinfo chrpath socat \
perl-Data-Dumper perl-Text-ParseWords perl-Thread-Queue python3-pip xz \
which SDL-devel xterm
```

## HOW TO BUILD

- Create a work folder and go inside it (e.g. /home/seco/BayTrail/):

```
$ mkdir /home/seco/BayTrail
$ cd /home/seco/BayTrail
```

- Create a local copy of poky pyro:

```
$ git clone -b pyro git://git.yoctoproject.org/poky
```

- Create a local copy of the meta-intel repository inside 'poky' folder:

```
$ cd poky
$ git clone -b pyro git://git.yoctoproject.org/meta-intel
Cloning into 'meta-intel'...
remote: Counting objects: 15068, done.
remote: Compressing objects: 100% (4701/4701), done.
remote: Total 15068 (delta 8768), reused 15011 (delta 8711)
Receiving objects: 100% (15068/15068), 4.44 MiB | 957.00 KiB/s, done.
Resolving deltas: 100% (8768/8768), done.
Checking connectivity... done.
```

- Copy meta-seco folder to 'poky' directory:

```
$ cp meta-seco -R /home/seco/BayTrail/poky/
```

- Create a 'build' directory outside 'poky' directory and go inside it:

```
$ mkdir /home/seco/BayTrail/build
$ cd /home/seco/BayTrail/build
```

- Source poky environment with desired target directory:

```
$ source /home/seco/BayTrail/poky/oe-init-build-env seco
(seco folder will be created)
```

- Configure the Build adding meta-intel and meta-seco BSP to bblayers.conf and selecting the BSP by setting MACHINE variable:

```
$ cd /home/seco/BayTrail/build/seco

$ bitbake-layers add-layer /home/seco/BayTrail/poky/meta-intel/
$ bitbake-layers add-layer /home/seco/BayTrail/poky/meta-seco/
$ echo 'INHERIT += "rm_work"' >> conf/local.conf
$ echo 'IMAGE_INSTALL_append = " seco-spi i2c-tools fxl6408 pcal6408
pca9655e minicom setserial net-tools spitools"' >> conf/local.conf

$ echo 'PARALLEL_MAKE ?= "-j ${@oe.utils.cpu_count()}"' >> conf/local.conf
$ echo 'BB_NUMBER_THREADS ?= "${@oe.utils.cpu_count()}"' >> conf/local.conf
$ echo 'MACHINE_EXTRA_RRECOMMENDS += "kernel-module-seco-spi"' >>
conf/local.conf
```

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```
$ echo 'KERNEL_MODULE_AUTOLOAD += " seco-spi"' >> conf/local.conf
$ echo 'MACHINE ??= "intel-corei7-64"' >> conf/local.conf
$ echo 'CORE_IMAGE_EXTRA_INSTALL+=" alsa-utils"' >> conf/local.conf
```

- You can also manually modify `local.conf` and `bblayers.conf` configuration files present in `seco/conf` folder. **Ensure** that in `local.conf` there aren't uncommented variables having same name of yours. Leave unchanged the others.
- Start to build choosing one of image configuration:

```
$ bitbake core-image-minimal      (will create a console-only minimal image)
$ bitbake core-image-sato         (will create a sato gui based image)
```

- You can find a complete list of available images with:

```
$ ls /home/seco/BayTrail/poky/meta/recipes*/images/*.bb
```

## OTHER SETTINGS FOR LOCAL.CONF

- If you want to use commercial features, like Intel high definition audio or some audio/video plugins

```
LICENSE_FLAGS_WHITELIST = "commercial"
```

- If you don't want to create ISO or HDDIMG. You can spare some hd space with these options

```
NOISO = "1"
```

```
NOHDD = "1"
```

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## 2. Provided Binaries

Binaries are created with the following commits:

meta-yocto-bsp                pyro: 2021e95bcd986e5bcfe457da5c3e16d60241d050  
meta-intel                    pyro: 4cd63f57820ce0e4ebd598251d3a13b5a4b9b791

### HOW TO CREATE YOCTO USB KEY LIVE IMAGE

- If you use your custom ISO image:
  - Go to `<BUILD_DIR>/tmp/deploy/images/<MACHINE_NAME>/`
  - Find your `<IMAGE_NAME><MACHINE_NAME>.iso`
  - Write ISO file with your favourite live usb creator, like **Rufus** (for Windows) or **gnome-disks** (with Ubuntu)
- If you use your custom HDD image:
  - Go to `<BUILD_DIR>/tmp/deploy/images/<MACHINE_NAME>/`
  - Find your `<IMAGE_NAME><MACHINE_NAME>.hddimg` (not provided in meta-seco/binary)
  - If `/dev/sdx` is the USB flash drive where you want to burn the image (pay attention, because `dd` doesn't ask for confirmation and you can instead easily erase your hard drive), type the following command:

```
# dd if=/dev/zero of=/dev/sdx bs=512 count=2
# sync
# dd if=<IMAGE_NAME><MACHINE_NAME>.hddimg of=/dev/sdx
```
- If you use SECO ISO binary image in meta-seco/binary directory:
  - Write ISO file with your favourite live usb creator, like **Rufus** (for Windows) or **gnome-disks** (with Ubuntu)

### HOW TO INSTALL YOCTO FROM USB KEY

- Create an USB key live image following “How to create an usb live image”
- Plug the USB key to the system
- Be sure that BIOS setting are configured to boot from USB key first (see on BIOS documentation downloadable from SECO web site)
- Turn on the board
- Select BOOT or INSTALL item in Yocto bootlader menu

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## 2. Known issues and FAQ

For **Bay Trail Boards**:

- Suspend to RAM (S3) and to disk (S4) is not supported, you need to disable it in BIOS settings:
  - Turn on the board
  - Enter in BIOS setting pressing ESC at boot
  - Go to SCU > Advanced > ACPI Table/Features Control > DSDT - ACPI S3 <Select Disabled> and DSDT - ACPI S4 <Select Disabled>
  - Save and exit.
- Seco-spi module works only in PCI mode.
- Suspend to ram doesn't properly work on live session.
- Suspend to ram doesn't work if i2c is enabled with DMA in pci mode. A solution is to switch in acpi mode (but seco-spi doesn't work anymore) or disable DMA channel for i2c.

For **Apollo Lake Boards**:

- Boot from SD card is not supported
- Wake on USB doesn't work

## FAQ

**Q:** SECO EAPI for x64 doesn't work

**A:** Quick fix, from Yocto shell:

```
# mkdir /lib64  
  
# ln -s /lib/ld-linux-x86-64.so.2 /lib64/
```

If you get `PARAMETER_ERROR` you can have a help passing `-?` as a parameter.

**Q:** No sound detected.

**A:** Sometimes also isn't configured correctly. Type `alsamixer` and try to unmute ("m") your speakers.

**Q:** Can I disable `ttyS0` serial outputs console?

**A:** Yes, you must add a comment to line containing `getty` invocation in `/etc/inittab`.

**Q:** How can I use GPIO expander on SBC-A44-pITX board?

**A:** In BIOS setup, you must set:

Advanced\LPSS&SCC Configuration\LPSS&SCC Devices Mode as **ACPI Mode**

Set Advanced\LPSS&SCC Configuration\LPSS DMA#2 Support as **Enabled**

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Set Advanced\LPSS&SCC Configuration\LPSS DMA#2 Support\Gpio Expander I2C Support as **Enabled**

You can access to 8 GPIO pin using **/sys/class/gpio/gpiochip330** device.

- On folder /sys/class/gpio can find **/sys/class/gpio/gpiochip330** device. The numbers from 330 to 337 are the 8 gpio of FXL6408 GPIO Expander
- Type `echo YYY | sudo tee /sys/class/gpio/export` to export the specific single GPIO YYY (YYY from 330 to 337).
- On folder /sys/class/gpio will be added a new gpio as gpio YYY.
- Read `/sys/class/gpio/gpioYYY/direction` value to know the current GPIO YYY direction
- Read `/sys/class/gpio/gpioYYY/value` value to know the current GPIO YYY status
- Use the command: `echo in | sudo tee /sys/class/gpio/gpioYYY/direction` to set GPIO YYY direction as input
- Use the command: `echo out | sudo tee /sys/class/gpio/gpioYYY/direction` to set GPIO YYY direction as output
- Use the command: `echo 1 | sudo tee /sys/class/gpio/gpioYYY/value` to set GPIO YYY status as high
- Use the command: `echo 0 | sudo tee /sys/class/gpio/gpioYYY/value` to set GPIO YYY status as low

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