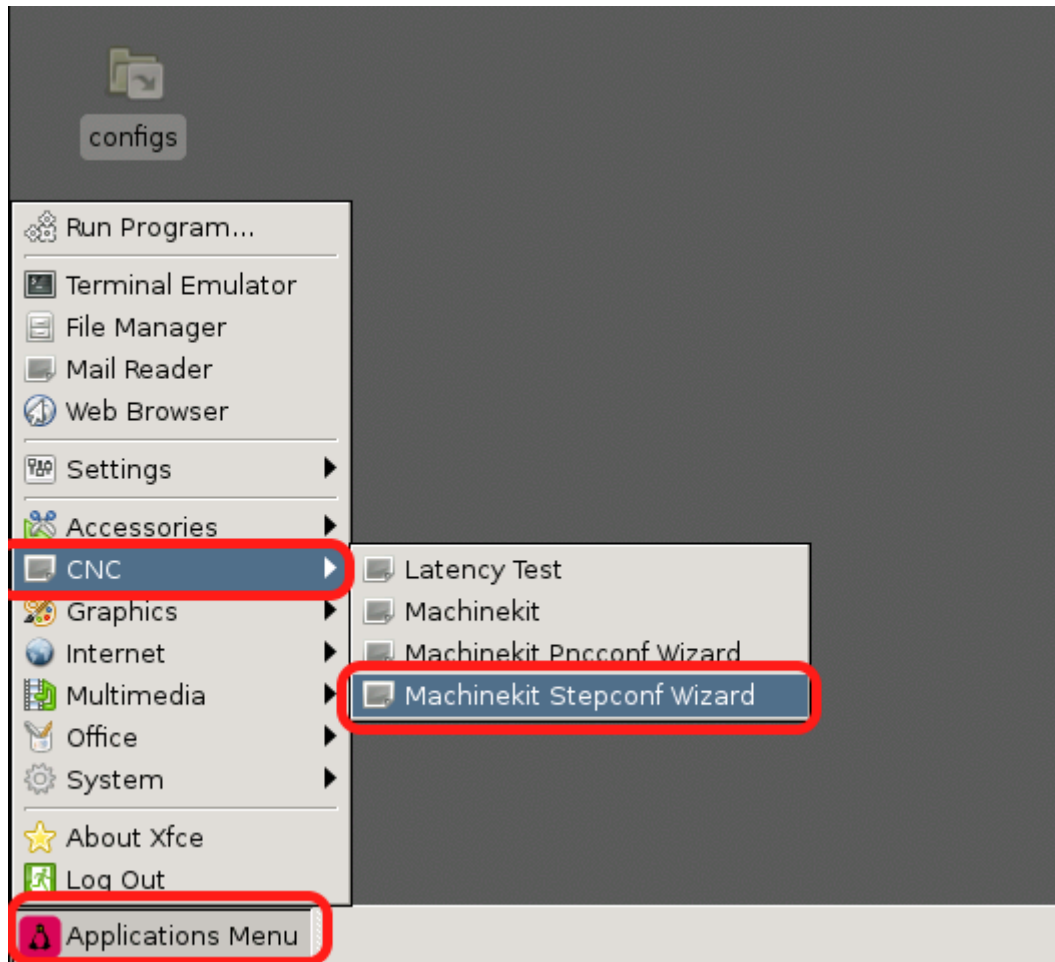
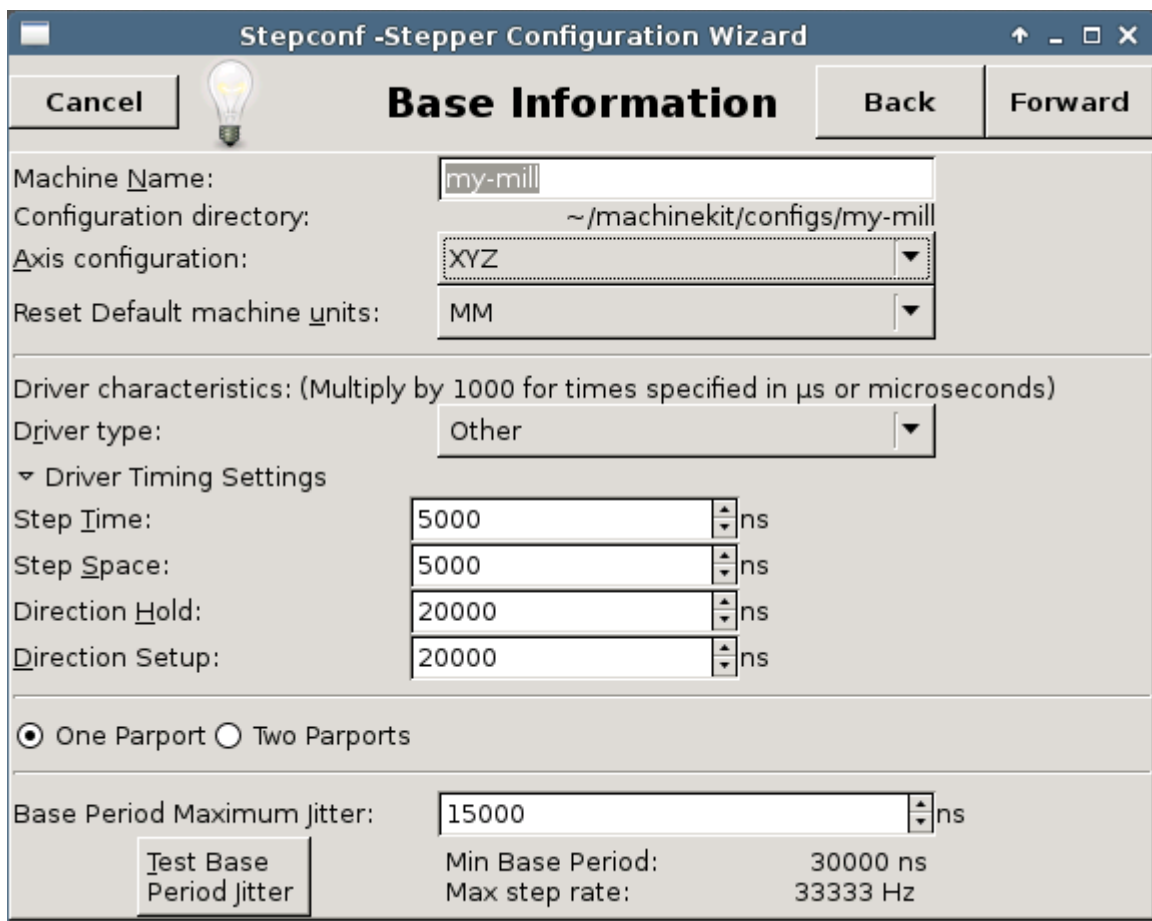
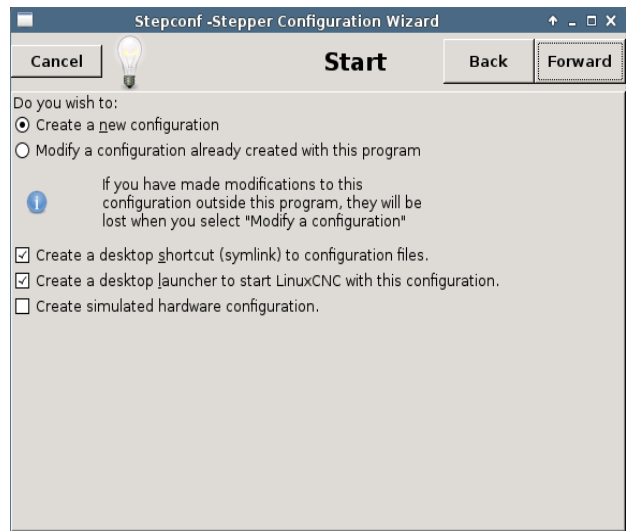
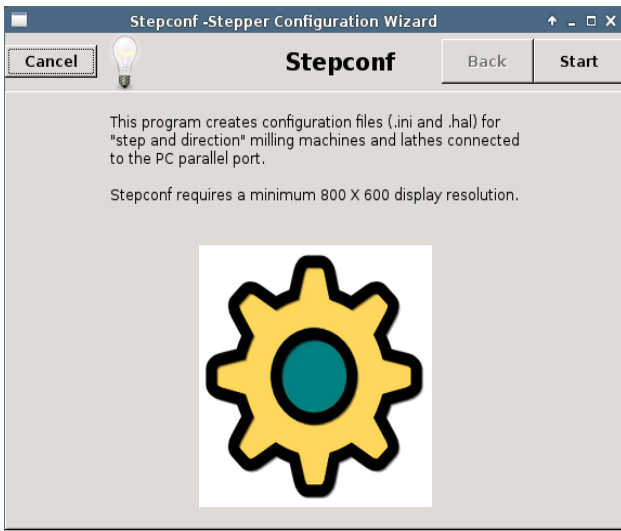


HOWTO

use the **GPIO driver**
with **Machinekit / LinuxCNC**





Stepconf -Stepper Configuration Wizard

Cancel **Parallel Port 1** Back Forward

Outputs (PC to Mill): Invert Inputs (Mill to PC): Invert

Pin 1:	ESTOP Out	<input type="checkbox"/>	Pin 10:	Unused	<input type="checkbox"/>
Pin 2:	X Step	<input type="checkbox"/>	Pin 11:	Unused	<input type="checkbox"/>
Pin 3:	X Direction	<input type="checkbox"/>	Pin 12:	Unused	<input type="checkbox"/>
Pin 4:	Y Step	<input type="checkbox"/>	Pin 13:	Unused	<input type="checkbox"/>
Pin 5:	Y Direction	<input type="checkbox"/>	Pin 15:	Unused	<input type="checkbox"/>
Pin 6:	Z Step	<input type="checkbox"/>			
Pin 7:	Z Direction	<input type="checkbox"/>			
Pin 8:	A Step	<input type="checkbox"/>	Parport Base Address:	0	
Pin 9:	A Direction	<input type="checkbox"/>	Output pinout presets:	Sherline	
Pin 14:	Spindle CW	<input type="checkbox"/>			
Pin 16:	Spindle PWM	<input type="checkbox"/>			
Pin 17:	Amplifier Enable	<input type="checkbox"/>			

Preset

Stepconf -Stepper Configuration Wizard

Cancel **Options** Back Forward

Include Halui user interface component

Include custom PyVCP GUI panel

- Blank program
- Spindle speed display
- Existing custom program
- Include connections to HAL

Include Classicladder PLC

setup number of external pins

Include modbus master support

- Blank ladder program
- Estop ladder program
- Serial modbus program
- Existing custom program
- Include connections to HAL

Onscreen prompt for manual tool change

Stepconf -Stepper Configuration Wizard

Cancel **Spindle** Back Forward

PWM Gate: 100 Hz Enter 0 Hz for "PDM" mode

Calibration:

Speed 1:	2000	PWM 1:	0.2
Speed 2:	8000	PWM 2:	0.8

Cycles per revolution: 100

Stepconf -Stepper Configuration Wizard

Cancel **Axis X** Back Forward

Motor steps per revolution: 200

Driver Microstepping: 2

Pulley teeth (Motor:Leadscrew): 1 : 1

Leadscrew Pitch: 5 mm / rev

Maximum Velocity: 25 mm / s

Maximum Acceleration: 750 mm / s²

Home location: 0

Table travel: 0 to 200

Home Switch location: 0

Home Search velocity: 1.5

Home Latch direction: Same

Time to accelerate to max speed: 0.0333 s

Distance to accelerate to max speed: 0.4167 mm

Pulse rate at max speed: 2000.0 Hz

Axis SCALE: 80.0 Steps / mm

Stepconf -Stepper Configuration Wizard

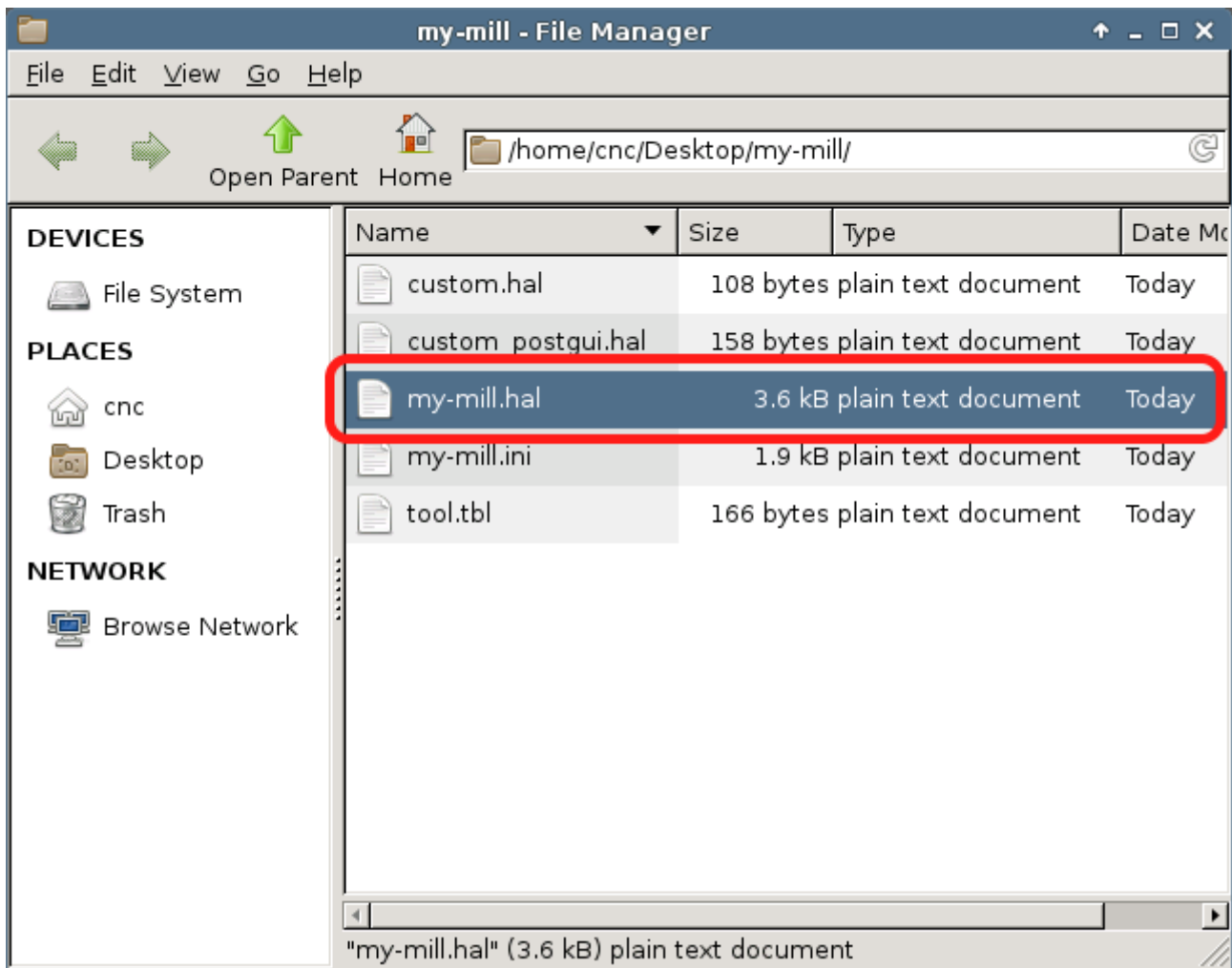
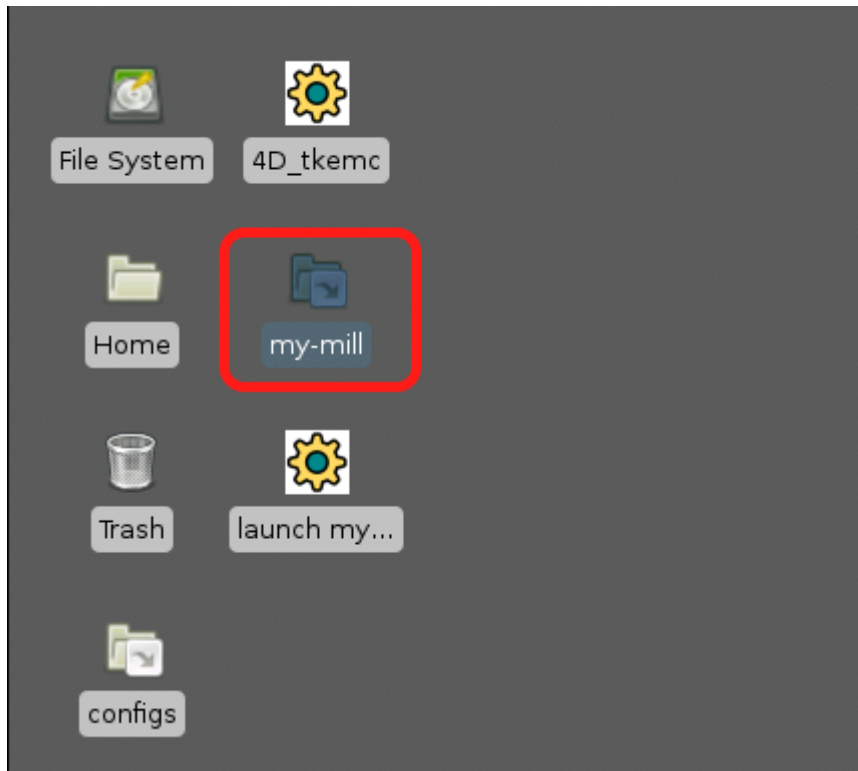
Cancel **Almost Done** Back Done

All the necessary information has now been gathered. Click "Done" to write your configuration files to disk.

If you experience lockups while running LinuxCNC:
-you will need to decrease the maximum velocity which will have the effect of increasing BASE_PERIOD.

If you experience lost steps while running LinuxCNC:
-first verify that you entered the proper timings for your stepper drivers.
-then run a more thorough latency test as described on the linuxcnc.org wiki.
<http://wiki.linuxcnc.org/cgi-bin/wiki.pl?TroubleShooting>

If you experience the "Unexpected Realtime Delay" message:
-run a more thorough latency test as described on the linuxcnc.org wiki.
<http://wiki.linuxcnc.org/cgi-bin/wiki.pl?TroubleShooting>



hal_parport > hal_gpio_h3
 parport.0 > hal_gpio_h3

```

# Generated by stepconf 1.1 at Sun Dec 10 00:04:20 2017
# If you make changes to this file, they will be
# overwritten when you run stepconf again
Loadrt trivkins
Loadrt tp
Loadrt [EMCMOT]EMCMOT_base_period_nsec=[EMCMOT]BASE_PERIOD_servo
Loadrt stepgen step_type=0,0,0
Loadrt pwmgen output_type=1

addf parport.0.read-base-thread
addf stepgen.make-pulses base-thread
addf pwmgen.make-pulses base-thread
addf parport.0.write-base-thread

addf stepgen.capture-position servo-thread
addf motion-command-handler servo-thread
addf motion-controller servo-thread
addf stepgen.update-freq servo-thread
addf pwmgen.update servo-thread

net spindle-cmd-rpm => pwmgen.0.value
net spindle-on <= motion.spindle-on => pwmgen.0.enable
net spindle-pwm <= pwmgen.0.pwm
setp pwmgen.0.pwm-freq 100.0
setp pwmgen.0.scale 10000.0

# Generated by stepconf 1.1 at Sat Dec 16 00:04:20 2017
# If you make changes to this file, they will be
# overwritten when you run stepconf again
Loadrt trivkins
Loadrt tp
Loadrt [EMCMOT]EMCMOT_base_period_nsec=[EMCMOT]BASE_PERIOD_servo
Loadrt stepgen step_type=0,0,0
Loadrt pwmgen output_type=1

Loadrt hal_gpio_h3 output_pins=3,5,7,8,10,11,12,16,18,19

addf hal_gpio_h3.read-base-thread
addf stepgen.make-pulses base-thread
addf pwmgen.make-pulses base-thread
addf hal_gpio_h3.write-base-thread

addf stepgen.capture-position servo-thread
addf motion-command-handler servo-thread
addf motion-controller servo-thread
addf stepgen.update-freq servo-thread
addf pwmgen.update servo-thread

net spindle-cmd-rpm => pwmgen.0.value
net spindle-on <= motion.spindle-on => pwmgen.0.enable
net spindle-pwm <= pwmgen.0.pwm
setp pwmgen.0.pwm-freq 100.0
setp pwmgen.0.scale 13166.666667
  
```

```

net spindle-cmd-rpm-abs <= motion.spindle-speed-out-abs
net spindle-cmd-rps <= motion.spindle-speed-out-rps
net spindle-cmd-rps-abs <= motion.spindle-speed-out-rps-abs
net spindle-at-speed => motion.spindle-at-speed
net spindle-cw <= motion.spindle-forward

net estop-out => parport.0.pin-01-out
net xstep => parport.0.pin-02-out
net xdir => parport.0.pin-03-out
net ystep => parport.0.pin-04-out
net ydir => parport.0.pin-05-out
net zstep => parport.0.pin-06-out
net zdir => parport.0.pin-07-out
net spindle-cw => parport.0.pin-14-out
net spindle-pwm => parport.0.pin-16-out
net xenable => parport.0.pin-17-out

setp stepgen.0.position-scale [AXIS_0]SCALE
setp stepgen.0.steplen 1
setp stepgen.0.stepspace 0
setp stepgen.0.dirhold 35000
setp stepgen.0.dirsetup 35000
setp stepgen.0.maxaccel [AXIS_0]STEPGEN_MAXACCEL
net xpos-cmd axis.0.motor-pos-cmd => stepgen.0.position-cmd
net xpos-fb stepgen.0.position-fb => axis.0.motor-pos-fb
net xsten <= stepgen.0.steplen

# Generated by stepconf 1.1 at Sat Dec 16 00:04:20 2017
net spindle-cmd-rpm-abs <= motion.spindle-speed-out-abs
net spindle-cmd-rps <= motion.spindle-speed-out-rps
net spindle-cmd-rps-abs <= motion.spindle-speed-out-rps-abs
net spindle-at-speed => motion.spindle-at-speed
net spindle-cw <= motion.spindle-forward

net estop-out => hal_gpio_h3.pin-03-out
net xstep => hal_gpio_h3.pin-05-out
net xdir => hal_gpio_h3.pin-07-out
net ystep => hal_gpio_h3.pin-08-out
net ydir => hal_gpio_h3.pin-10-out
net zstep => hal_gpio_h3.pin-11-out
net zdir => hal_gpio_h3.pin-12-out
net spindle-cw => hal_gpio_h3.pin-16-out
net spindle-pwm => hal_gpio_h3.pin-18-out
net xenable => hal_gpio_h3.pin-19-out

setp stepgen.0.position-scale [AXIS_0]SCALE
setp stepgen.0.steplen 1
setp stepgen.0.stepspace 0
setp stepgen.0.dirhold 35000
setp stepgen.0.dirsetup 35000
setp stepgen.0.maxaccel [AXIS_0]STEPGEN_MAXACCEL
net xpos-cmd axis.0.motor-pos-cmd => stepgen.0.position-cmd
net xpos-fb stepgen.0.position-fb => axis.0.motor-pos-fb
net xsten <= stepgen.0.steplen
  
```

Orange Pi (H3 SoC) GPIO - pinout

MUX 3		MUX 2		1 2		MUX 2		MUX 3	
		+3.3V Power		+5V Power		+5V Power			
DI_RX	TWI0_SDA	PA12	3						
DI_TX	TWI0_SCK	PA11	5						
PWM1	SIM_PWREN	PA6	7		8	PA13		SPI1_CS	UART3_TX
		Ground			10	PA14		SPI1_CLK	UART3_RX
JTAG_CK	UART2_RX	PA1	11		12	PD14		RGMII_NULL	
JTAG_MS	UART2_TX	PA0	13			Ground		NCE0	
JTAG_DI	UART2_CTS	PA3	15		16	PC4		NRB1	
		+3.3V Power			18	PC7			
SPI0_MOSI	NAND_WE#	PC0	19			Ground		UART2_RTS	JTAG_DO
SPI0_MISO	NALE	PC1	21		22	PA2		NCE1	SPI0_CS
SPI0_CLK	NCLE	PC2	23		24	PC3		PCM0_DIN	SIM_VPPEN
		Ground			26	PA21		PCM0_SYNC	TWI1_SCK
TWI1_SDA	PCM0_CLK	PA19	27		28	PA18			
	SIM_CLK	PA7	29		32	PG8		UART1_RTS	
	SIM_DATA	PA8	31			Ground		UART1_CTS	
	SIM_RST	PA9	33		36	PG9		UART1_TX	
	SIM_DET	PA10	35		38	PG6		UART1_RX	
SIM_VPPEN	PCM0_DOUT	PA20	37		40	PG7			
		Ground							
					39 40				

NOTE: GPIO voltage levels are 3.3V.

Legend: JTAG (Blue), I2C (Light Blue), SPI (Purple), +5V (Red), GPIO (Green), UART (Yellow), +3.3V (Orange), Ground (Black), I2S/PCM (Pink)

