HAL

HAL stands for Hardware Abstraction Layer. At the highest level, it is simply a way to allow a number of building blocks to be loaded and interconnected to assemble a complex system. This is designed to make it easier to configure LinuxCNC for hardware devices.

There are two components that may be modified more often: kinematics model and physical memory address. To load a kinematics model, type its file name on the first line

Loadrt 'name'

The control board uses parallel port, and its physical memory address has to be determined in order to enable the communication from the board. In Linux, this address can be determined by the following command in the terminal.

cat /proc/ioports | grep parport

Parameter

Many hardware components have adjustments that are not connected to any other components but still need to be accessed. For example, servo amps often have trim pots to allow for tuning adjustments, and test points where a meter or scope can be attached to view the tuning results. HAL components also can have such items, which are referred to as *parameters*. There are two types of parameters: Input parameters are equivalent to trim pots - they are values that can be adjusted by the user, and remain fixed once they are set. Output parameters cannot be adjusted by the user - they are equivalent to test points that allow internal signals to be monitored.

Pin

Hardware components have terminals which are used to interconnect them. The HAL equivalent is a *pin* or *HAL pin*. (*HAL pin* is used when needed to avoid confusion.) All HAL pins are named, and the pin names are used when interconnecting them. HAL pins are software entities that exist only inside the computer.

Physical_Pin

Many I/O devices have real physical pins or terminals that connect to external hardware, for example the pins of a parallel port connector. To avoid confusion, these are referred to as *physical pins*. These are the things that *stick out* into the real world.

Signal

In a physical machine, the terminals of real hardware components are interconnected by wires. The HAL equivalent of a wire is a *signal* or *HAL signal*. HAL signals connect HAL pins together as required by the machine builder. HAL signals can be disconnected and reconnected at will (even while the machine is running).

For additional information, please visit http://linuxcnc.org/docs/html/hal/intro.html

INI

The .ini file is the configuration file that sets specific parameters for each stepper motors. There are several section in this file, and the description for each section is listed below:

[EMC] general information

[DISPLAY] settings related to the graphical user interface

[FILTER] settings input filter programs

[RS274NGC] settings used by the g-code interpreter

[EMCMOT] settings used by the real time motion controller

[TASK] settings used by the task controller

[HAL] specifies .hal files

[HALUI] MDI commands used by HALUI

[APPLICATIONS] Other applications to be started by LinuxCNC

[TRAJ] additional settings used by the real time motion controller

[AXIS_n] individual axis variables

[EMCIO] settings used by the I/O Controller

For additional information regarding specific parameter, please visit
http://linuxcnc.org/docs/html/config/ini-config.html