

HAL and XML File Explanation

Learn more about HAL in linuxcnc [here](#) and about HAL functions [here](#).

Learn more about xml files in Linuxcnc [here](#).

Learn more about adding slaves into xml file [here](#).

As a personal preference, I use Sublime Text application for editing and viewing the HAL and XML file.

It is important to note that the XML and the HAL file must be kept in the same folder.

In the XML file, the last PDO (as shown in the below picture) is a dummy PDO. This is because for these particular motors, the summation of bit lengths should be multiple of 16. This varies from product to product and the specifications can be found in the manual.

```
<pdoEntry idx="0000" subIdx="00" bitlen="8"/>
```

If you want to change the XML file in HAL file, change the file name here in the HAL file:

```
loadrt trivkins
loadrt threads name1=servo-thread period1=1000000
loadrt limit3 count=2
#loadusr -Wn pacmac_ui pyvcp -c pacmac_ui vcp.xml
#loadusr -W lcec_conf pacmac_ecat.xml
loadusr -W lcec_conf CSP2Motor.xml
loadrt lcec
```

For changing the values of pins, the command is:

setp lcec.master_number.slave_number.halpin_name-bit_number value

For example, consider the command:

```
setp lcec.0.0.opmode-3 1
setp lcec.0.1.opmode-3 1
```

The first command sets the value as 1 of 3rd bit of Halpin named opmode of 0th slave of 0th master.

Similarly, the second command sets the value as 1 of 3rd bit of Halpin named opmode of 1st slave of 0th master.

```
net drv_en_0    lcec.0.0.drivecontrol-0
net drv_en_0    lcec.0.0.drivecontrol-3

net drv_en_1    lcec.0.1.drivecontrol-0
net drv_en_1    lcec.0.1.drivecontrol-3
```

net command links the signal to a particular pin.

sets command the value of signal.

For example, in command terminal, I give the command:

`sets drv_en_0 1`

This command the make the value of pins lcec.0.0.drivecontrol-0 and lcec.0.0.drivecontrol-3 as 1.

Learn more about HAL functions [here](#).

Errors:

If you see the following error while executing the HAL file:

```
Note: Using POSIX realtime
automata@automata: ~/Desktop/Harsh/CSV$ halrun -I -f CSV.hal
Note: Using POSIX realtime
lcec_conf: ERROR: Parse error at line 15: mismatched tag
CSV.hal:6: waitpid failed lcec_conf lcec_conf
CSV.hal:6: lcec_conf exited without becoming ready
halcmd: █
```

This means there is a syntax error in HAL or XML file.

If you see the following after you type the command `ethercat slaves` in the terminal, that means the syntax of HAL and XML is fine but there is some internal error. The error is indicated by the letter E instead of + in the below picture.

In my scenario, I removed the dummy variable which caused the summation of bit lengths not be a multiple of 16 which caused this error.

```
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP + ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP E ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP E ZeroErr Driver
automata@automata:~$ ethercat slaves
0 0:0 PREOP E ZeroErr Driver
automata@automata:~$ █
```

Display Error: Sometimes when you connect the monitor, keyboard and mouse to the linux box, everything is fine until the login page. After that a black screen is displayed and you can see and use the cursor but do not see the desktop. This happens to the VGA cable. Remove it once and connect it once more. Try this 3-4 times. The error resolves itself.