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To use the following programs on Windows/Linux, Python 3.14 with tkinter is required.

1. XML Generator

1.1 Load the .xml ESI file from the manufacturer.

ESI → LinuxCNC

Load ESI

Rename HAL pins (PDO)

Reduce pdo to csp essential

Duplicate slave

Save XML

```
<masters>
<master idx="0" appTimePeriod="1000000" refClockSyncCycles="1">
  <slave idx="0" type="EK1100"/>
  <slave idx="1" type="generic" vid="00000766" pid="00000402" configPdcs="true">
    <dcConf assignActivate="300" sync0Cycle="*1" sync0Shift="0"/>
    <syncManager idx="2" dir="out">
      <pdo idx="1600">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="obj-60b8" halType="s32"/>
        <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="modes-of-operation" halType="s32"/>
        <pdoEntry idx="60FF" subIdx="00" bitLen="32" halPin="target-velocity" halType="s32"/>
      </pdo>
      <pdo idx="1701">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="obj-60b8" halType="s32"/>
        <pdoEntry idx="60FE" subIdx="01" bitLen="32" halPin="obj-60fe" halType="s32"/>
      </pdo>
      <pdo idx="1702">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="obj-60b8" halType="s32"/>
        <pdoEntry idx="6071" subIdx="00" bitLen="16" halPin="target-torque" halType="s32"/>
        <pdoEntry idx="607F" subIdx="00" bitLen="32" halPin="obj-607f" halType="s32"/>
        <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="modes-of-operation" halType="s32"/>
      </pdo>
      <pdo idx="1703">
```

1.2 Replace the names of the HAL pins (PDO).

It replaces the name modes of operation → opmode and a few others; all pin names can be found in the servodriver manual.

ESI → LinuxCNC

Load ESI

Rename HAL pins (PDO)

Reduce pdo to csp essential

Duplicate slave

Save XML

```
<masters>
<master idx="0" appTimePeriod="1000000" refClockSyncCycles="1">
  <slave idx="0" type="EK1100"/>
  <slave idx="1" type="generic" vid="00000766" pid="00000402" configPdcs="true">
    <dcConf assignActivate="300" sync0Cycle="*1" sync0Shift="0"/>
    <syncManager idx="2" dir="out">
      <pdo idx="1600">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="probe-cmd" halType="s32"/>
        <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="opmode" halType="s32"/>
        <pdoEntry idx="60FF" subIdx="00" bitLen="32" halPin="target-velocity" halType="s32"/>
      </pdo>
      <pdo idx="1701">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="probe-cmd" halType="s32"/>
        <pdoEntry idx="60FE" subIdx="01" bitLen="32" halPin="obj-60fe" halType="s32"/>
      </pdo>
      <pdo idx="1702">
        <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/>
        <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/>
        <pdoEntry idx="60B8" subIdx="00" bitLen="16" halPin="probe-cmd" halType="s32"/>
        <pdoEntry idx="6071" subIdx="00" bitLen="16" halPin="target-torque" halType="s32"/>
        <pdoEntry idx="607F" subIdx="00" bitLen="32" halPin="obj-607f" halType="s32"/>
        <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="opmode" halType="s32"/>
      </pdo>
      <pdo idx="1703">
```

1.3 Reduce PDOs to CSP essential.

Keeps the first output group and the first input PDO, keeps essential PDOs for CSP mode; if you want to use CSV mode, target velocity is kept instead of target position. The text can be edited manually.

ESI → LinuxCNC

Load ESI	<pre><masters> <master idx="0" appTimePeriod="1000000" refClockSyncCycles="1"> <slave idx="0" type="EK1100"/> <slave idx="1" type="generic" vid="00000766" pid="00000402" configPdcs="true"> <dcConf assignActivate="300" sync0Cycle="*1" sync0Shift="0"/> <syncManager idx="2" dir="out"> <pdo idx="1600"> <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/> <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/> <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="opmode" halType="s32"/> </pdo> </syncManager> <syncManager idx="3" dir="in"> <pdo idx="1A00"> <pdoEntry idx="6041" subIdx="00" bitLen="16" halPin="status-word" halType="u32"/> <pdoEntry idx="6064" subIdx="00" bitLen="32" halPin="actual-position" halType="s32"/> <pdoEntry idx="606C" subIdx="00" bitLen="32" halPin="actual-velocity" halType="s32"/> <pdoEntry idx="6061" subIdx="00" bitLen="8" halPin="opmode-display" halType="s32"/> </pdo> </syncManager> </slave> </master> </masters></pre>
Rename HAL pins (PDO)	
Reduce pdo to csp essential	
Duplicate slave	
Save XML	

1.4 Duplicate the slave.

Each click duplicates the text `</slave... </slave>` and increments the slave index in numerical order.

ESI → LinuxCNC

Load ESI	<pre><masters> <master idx="0" appTimePeriod="1000000" refClockSyncCycles="1"> <slave idx="0" type="EK1100"/> <slave idx="1" type="generic" vid="00000766" pid="00000402" configPdcs="true"> <dcConf assignActivate="300" sync0Cycle="*1" sync0Shift="0"/> <syncManager idx="2" dir="out"> <pdo idx="1600"> <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/> <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/> <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="opmode" halType="s32"/> </pdo> </syncManager> <syncManager idx="3" dir="in"> <pdo idx="1A00"> <pdoEntry idx="6041" subIdx="00" bitLen="16" halPin="status-word" halType="u32"/> <pdoEntry idx="6064" subIdx="00" bitLen="32" halPin="actual-position" halType="s32"/> <pdoEntry idx="606C" subIdx="00" bitLen="32" halPin="actual-velocity" halType="s32"/> <pdoEntry idx="6061" subIdx="00" bitLen="8" halPin="opmode-display" halType="s32"/> </pdo> </syncManager> </slave> <slave idx="2" type="generic" vid="00000766" pid="00000402" configPdcs="true"> <dcConf assignActivate="300" sync0Cycle="*1" sync0Shift="0"/> <syncManager idx="2" dir="out"> <pdo idx="1600"> <pdoEntry idx="6040" subIdx="00" bitLen="16" halPin="control-word" halType="u32"/> <pdoEntry idx="607A" subIdx="00" bitLen="32" halPin="target-position" halType="s32"/> <pdoEntry idx="6060" subIdx="00" bitLen="8" halPin="opmode" halType="s32"/> </pdo> </syncManager> <syncManager idx="3" dir="in"> <pdo idx="1A00"> <pdoEntry idx="6041" subIdx="00" bitLen="16" halPin="status-word" halType="u32"/> <pdoEntry idx="6064" subIdx="00" bitLen="32" halPin="actual-position" halType="s32"/> <pdoEntry idx="606C" subIdx="00" bitLen="32" halPin="actual-velocity" halType="s32"/> <pdoEntry idx="6061" subIdx="00" bitLen="8" halPin="opmode-display" halType="s32"/> </pdo> </syncManager> </slave> </master> </masters></pre>
Rename HAL pins (PDO)	
Reduce pdo to csp essential	
Duplicate slave	
Save XML	

1.5 Save Xml

ethercat-conf
XML

2. HAL Generator

2.1 Load ethercat-conf.xml

After loading ethercat-conf.xml, all PDOs available in the selected file will appear, and in the HAL generation window on the right side, the configuration initialization section will appear.

LinuxCNC executes the configuration line by line, initializing modules, setting parameters, and preparing the system for motion control.

Among others, in this line: "loadusr -W lcec_conf ethercat-conf.xml", the PDOs from the file with the prefix lcec will be loaded into the HAL module running in LinuxCNC's internal memory in real time, where all signal connections between devices and the control system are created.

LinuxCNC HAL Generator - FULL PDO Wizard

Load ethercat-conf.xml Load cia402.comp Save HAL

PDO / Pins

Slave 0

Slave 1

- ☒ 0x6040 control-word
- ☒ 0x607A target-position
- ☒ 0x6060 opmode
- ☒ 0x6041 status-word
- ☒ 0x6064 actual-position
- ☒ 0x606C actual-velocity
- ☒ 0x6061 opmode-display

Slave 2

- ☒ 0x6040 control-word
- ☒ 0x607A target-position
- ☒ 0x6060 opmode
- ☒ 0x6041 status-word
- ☒ 0x6064 actual-position
- ☒ 0x606C actual-velocity
- ☒ 0x6061 opmode-display

Slave 3

- ☒ 0x6040 control-word
- ☒ 0x607A target-position
- ☒ 0x6060 opmode
- ☒ 0x6041 status-word
- ☒ 0x6064 actual-position
- ☒ 0x606C actual-velocity
- ☒ 0x6061 opmode-display

Ciacomp Pins

General

Parameters

pos_scale 1677721.6

velo_scale

auto_fault_reset

csp_mode 1

Joints

☒ joint.0.motor-pos-cmd pos-cmd

☒ joint.0.motor-pos-fb pos-fb

☒ joint.0.amp-enable-out enable

☒ joint.0.amp-fault-in drv-fault

For CST mode

☐ joint.0.vel-cmd velocity-cmd

☐ joint.0.vel-fb velocity-fb

Homing

☒ joint.0.request-custom-homing home

☒ joint.0.is-custom-homing stat-homing

```
# =====
# AUTO GENERATED HAL - FULL PDO SUPPORT
# =====

loadrt [KINS]KINEMATICS
loadrt [EMCMOT]EMCMOT servo_period_nsec=[EMCMOT]SERVO_PERIOD num_joints=[KINS]JOINTS
loadusr -W lcec_conf ethercat-conf.xml
loadrt cia402 count=0
loadrt lcec

addf lcec.read-all servo-thread
addf motion-command-handler servo-thread
addf motion-controller servo-thread
addf lcec.write-all servo-thread

setp ioccontrol.0.emc-enable-in 1
```

2.2. load cia402.comp

The .comp file is parsed into pins and parameters; most of the suggested pins are automatically matched. The pos_scale value should be selected based on the encoder and the stroke per revolution

LinuxCNC HAL Generator - FULL PDO Wizard

Load ethercat-conf.xml Load cia402.comp Save HAL

PDO / Pins

Slave 0

Slave 1

- ☒ 0x6040 control-word controlword
- ☒ 0x607A target-position drv_target_position
- ☒ 0x6060 opmode opmode
- ☒ 0x6041 status-word statusword
- ☒ 0x6064 actual-position drv_actual_position
- ☒ 0x606C actual-velocity drv_actual_velocity
- ☒ 0x6061 opmode-display opmode_display

Slave 2

- ☒ 0x6040 control-word controlword
- ☒ 0x607A target-position drv_target_position
- ☒ 0x6060 opmode opmode
- ☒ 0x6041 status-word statusword
- ☒ 0x6064 actual-position drv_actual_position
- ☒ 0x606C actual-velocity drv_actual_velocity
- ☒ 0x6061 opmode-display opmode_display

Slave 3

- ☒ 0x6040 control-word controlword
- ☒ 0x607A target-position drv_target_position
- ☒ 0x6060 opmode opmode
- ☒ 0x6041 status-word statusword

Ciacomp Pins

General

Parameters

pos_scale 1677721.6

velo_scale

auto_fault_reset

csp_mode 1

Joints

☒ joint.0.motor-pos-cmd pos-cmd

☒ joint.0.motor-pos-fb pos-fb

☒ joint.0.amp-enable-out enable

☒ joint.0.amp-fault-in drv-fault

For CST mode

☐ joint.0.vel-cmd velocity-cmd

☐ joint.0.vel-fb velocity-fb

Homing

☒ joint.0.request-custom-homing home

☒ joint.0.is-custom-homing stat-homing

```
# =====
# AUTO GENERATED HAL - FULL PDO SUPPORT
# =====

loadrt [KINS]KINEMATICS
loadrt [EMCMOT]EMCMOT servo_period_nsec=[EMCMOT]SERVO_PERIOD num_joints=[KINS]JOINTS
loadusr -W lcec_conf ethercat-conf.xml
loadrt cia402 count=0
loadrt lcec

addf lcec.read-all servo-thread
addf motion-command-handler servo-thread
addf motion-controller servo-thread
addf lcec.write-all servo-thread

setp ioccontrol.0.emc-enable-in 1
```

2.3. Axis selection

During selection, a specific machine axis (X, Y, Y2, Z, etc.) is assigned to the selected EtherCAT slave, and parameters common to all axes are set. Based on this, the program automatically connects the selected axis to the appropriate control input.

The HAL file preview is updated in real time, making it easy to understand which value is responsible for what and how the individual settings are related to each other while changing parameters.

LinuxCNC HAL Generator - FULL PDO Wizard

Load ethercat-conf.xml | Load cia402.comp | Save HAL

PDO / Pins	Ciacomp Pins	General Parameters
Slave 0		
Slave 1	X	
<input checked="" type="checkbox"/> 0x6040 control-word	controlword	pos_scale 1677721.6
<input checked="" type="checkbox"/> 0x607A target-position	drv_target_position	velo_scale
<input checked="" type="checkbox"/> 0x6060 opmode	opmode	auto_fault_reset
<input checked="" type="checkbox"/> 0x6041 status-word	statusword	csp_mode 1
<input checked="" type="checkbox"/> 0x6064 actual-position	drv_actual_position	Joints
<input checked="" type="checkbox"/> 0x606C actual-velocity	drv_actual_velocity	<input checked="" type="checkbox"/> joint.0.motor-pos-cmd pos-cmd
<input checked="" type="checkbox"/> 0x6061 opmode-display	opmode_display	<input checked="" type="checkbox"/> joint.0.motor-pos-fb pos-fb
Slave 2	Y	<input checked="" type="checkbox"/> joint.0.amp-enable-out enable
<input checked="" type="checkbox"/> 0x6040 control-word	controlword	<input checked="" type="checkbox"/> joint.0.amp-fault-in drv-fault
<input checked="" type="checkbox"/> 0x607A target-position	drv_target_position	
<input checked="" type="checkbox"/> 0x6060 opmode	opmode	For CST mode
<input checked="" type="checkbox"/> 0x6041 status-word	statusword	<input type="checkbox"/> joint.0.vel-cmd velocity-cmd
<input checked="" type="checkbox"/> 0x6064 actual-position	drv_actual_position	<input type="checkbox"/> joint.0.vel-fb velocity-fb
<input checked="" type="checkbox"/> 0x606C actual-velocity	drv_actual_velocity	
<input checked="" type="checkbox"/> 0x6061 opmode-display	opmode_display	Homing
Slave 3	Z	<input checked="" type="checkbox"/> joint.0.request-custom-homing home
<input checked="" type="checkbox"/> 0x6040 control-word	controlword	<input checked="" type="checkbox"/> joint.0.is-custom-homing stat-homing
<input checked="" type="checkbox"/> 0x607A target-position	drv_target_position	<input checked="" type="checkbox"/> joint.0.custom-homing-finished stat-homed
<input checked="" type="checkbox"/> 0x6060 opmode	opmode	
<input checked="" type="checkbox"/> 0x6041 status-word	statusword	
<input checked="" type="checkbox"/> 0x6064 actual-position	drv_actual_position	
<input checked="" type="checkbox"/> 0x606C actual-velocity	drv_actual_velocity	
<input checked="" type="checkbox"/> 0x6061 opmode-display	opmode_display	

```
# =====  
# AUTO GENERATED HAL - FULL PDO SUPPORT  
# =====  
  
loadrt [KINS]KINEMATICS  
loadrt [EMCMOT]EMCMOT servo_period_nsec=[EMCMOT]SERVO_PERIOD num_joints=[KINS]JOINTS  
loadusr -W lcec_conf ethercat-conf.xml  
loadrt cia402 count=3  
loadrt lcec  
  
addf lcec.read-all servo-thread  
addf cia402.0.read-all servo-thread  
addf cia402.1.read-all servo-thread  
addf cia402.2.read-all servo-thread  
addf motion-command-handler servo-thread  
addf motion-controller servo-thread  
addf cia402.0.write-all servo-thread  
addf cia402.1.write-all servo-thread  
addf cia402.2.write-all servo-thread  
addf lcec.write-all servo-thread  
  
setp iocontrol.0.emc-enable-in 1  
  
# ----- AXIS X / joint.0 / cia402.0 / slave.1 -----  
setp cia402.0.pos-scale 1677721.6  
setp cia402.0.csp-mode 1  
  
net X-pos-cmd joint.0.motor-pos-cmd => cia402.0.pos-cmd  
net X-pos-fb cia402.0.pos-fb => joint.0.motor-pos-fb  
net X-enable joint.0.amp-enable-out => cia402.0.enable  
net X-amp-fault cia402.0.drv-fault => joint.0.amp-fault-in  
net X-custom-home joint.0.request-custom-homing => cia402.0.home  
net X-is-custom-homing cia402.0.stat-homing => joint.0.is-custom-homing  
net X-custom-home-done cia402.0.stat-homed => joint.0.custom-homing-finished  
  
net X-control-word cia402.0.controlword => lcec.0.1.control-word  
net X-target-position cia402.0.drv-target-position => lcec.0.1.target-position  
net X-opmode cia402.0.opmode => lcec.0.1.opmode  
net X-actual-position cia402.0.drv-actual-position => lcec.0.1.actual-position  
net X-actual-velocity cia402.0.drv-actual-velocity => lcec.0.1.actual-velocity  
net X-opmode-display cia402.0.opmode-display => lcec.0.1.opmode-display  
net X-status-word lcec.0.1.status-word => cia402.0.statusword  
  
# ----- AXIS Y / joint.1 / cia402.1 / slave.2 -----  
setp cia402.1.pos-scale 1677721.6  
setp cia402.1.csp-mode 1  
  
net Y-pos-cmd joint.1.motor-pos-cmd => cia402.1.pos-cmd  
net Y-pos-fb cia402.1.pos-fb => joint.1.motor-pos-fb  
net Y-enable joint.1.amp-enable-out => cia402.1.enable  
net Y-amp-fault cia402.1.drv-fault => joint.1.amp-fault-in  
net Y-custom-home joint.1.request-custom-homing => cia402.1.home  
net Y-is-custom-homing cia402.1.stat-homing => joint.1.is-custom-homing  
net Y-custom-home-done cia402.1.stat-homed => joint.1.custom-homing-finished
```

2.4. Save HAL

HAL files

3. INI Generator

3.1 Load HAL

The HAL file is treated here as a description of logical connections. In LinuxCNC, an abstract logical model is created that corresponds to how LinuxCNC sees the machine.

Here it is similar, except that the file is only analyzed. The program checks whether the servos share common signals and whether the set of signals is consistent.

The machine moves within a closed space, and homing in this configuration is intended for absolute encoders, which most often use soft limits [MIN_LIMIT] [MAX_LIMIT] often without the use of physical limit switch inputs and I/O modules. For this reason, before using automatic configuration, proper installation of the CIA402 homing component is required.

(linuxcnc-dev, cia402_homecomp.comp, cia402_homecomp.h, basecomp.comp)

HAL -> INI Generator (EtherCAT Servo)

Load HAL Save INI

Element Detected

JOINTS

SERVOS

cia402.0

cia402.1

cia402.2

cia402.3

VALIDATION

Essential signals

Axis cohesion

EMC

Enable

MACHINE Generated_EtherCAT

DEBUG 0

VERSION 1.1

DISPLAY

Enable

DISPLAY axis

EDITOR gedit

POSITION_OFFSET RELATIVE

POSITION_FEEDBACK ACTUAL

ARCDIVISION 64

GRIDS 10mm 20mm 50mm 100mm

MAX_FEED_OVERRIDE 1.2

DEFAULT_LINEAR_VELOCITY 5

MAX_ANGULAR_VELOCITY 50

MIN_LINEAR_VELOCITY 0

MAX_LINEAR_VELOCITY 50

CYCLE_TIME 0.100

INTRO_GRAPHIC linuxcnc.gif

INTRO_TIME 1

INCREMENTS 5mm 1mm .5mm .1mm

KINS

Enable

JOINTS 4

KINEMATICS trivkins coordinates=XYZA

TASK

Enable

TASK milltask

CYCLE_TIME 0.010

EMCMOT

Enable

EMCMOT motmod

COMM_TIMEOUT 1.0

SERVO_PERIOD 1000000

HOMEMOD cia402_homecomp

HAL

Enable

HALFILE hahahal.hal

HALUI halui

TRAJ

Enable

COORDINATES X Y Z A

LINEAR_UNITS mm

ANGULAR_UNITS degree

DEFAULT_LINEAR_VELOCITY 5

MAX_LINEAR_VELOCITY 50

EMCIO

Enable

EMCIO io

CYCLE_TIME 0.100

RS274NGC

Enable

PARAMETER_FILE gcodeparam.var

AXIS

Enable

MAX_VELOCITY 50

MAX_ACCELERATION 100

MIN_LIMIT -1000

MAX_LIMIT 1000

JOINT

Enable

TYPE LINEAR

HOME 0

MIN_LIMIT -1000

MAX_LIMIT 1000

MAX_VELOCITY 50

MAX_ACCELERATION 100

FERROR 1000

MIN_FERROR 1000

HOME_ABSOLUTE_ENCODER 2

```
[EMC]
MACHINE = Generated_EtherCAT
DEBUG = 0
VERSION = 1.1

[DISPLAY]
DISPLAY = axis
EDITOR = gedit
POSITION_OFFSET = RELATIVE
POSITION_FEEDBACK = ACTUAL
ARCDIVISION = 64
GRIDS = 10mm 20mm 50mm 100mm
MAX_FEED_OVERRIDE = 1.2
DEFAULT_LINEAR_VELOCITY = 5
MAX_ANGULAR_VELOCITY = 50
MIN_LINEAR_VELOCITY = 0
MAX_LINEAR_VELOCITY = 50
CYCLE_TIME = 0.100
INTRO_GRAPHIC = linuxcnc.gif
INTRO_TIME = 1
INCREMENTS = 5mm 1mm .5mm .1mm

[KINS]
JOINTS = 4
KINEMATICS = trivkins coordinates=XYZA

[TASK]
TASK = milltask
CYCLE_TIME = 0.010

[EMCMOT]
EMCMOT = motmod
COMM_TIMEOUT = 1.0
SERVO_PERIOD = 1000000
HOMEMOD = cia402_homecomp

[TRAJ]
COORDINATES = X Y Z A
LINEAR_UNITS = mm
ANGULAR_UNITS = degree
DEFAULT_LINEAR_VELOCITY = 5
MAX_LINEAR_VELOCITY = 50

[HAL]
HALFILE = hahahal.hal
HALUI = halui

[EMCIO]
EMCIO = io
CYCLE_TIME = 0.100

[RS274NGC]
PARAMETER_FILE = gcodeparam.var

[AXIS_X]
MAX_VELOCITY = 50
MAX_ACCELERATION = 100
MIN_LIMIT = -1000
MAX_LIMIT = 1000

[JOINT_0]
```

3.2. Gantry mode

In other words, using two motors in one plane.

After switching to gantry mode, the following arrangement is created:

1 : 1	Gantry
Axis X → joint.0	Axis X → joint.0
Axis Y → joint.1	Axis Y → joint.1 , joint.2
Axis Z → joint.2	Axis Z → joint.3
Axis A → joint.3	

And the parameters in [KINS] and [TRAJ] change dynamically and later define the recognition of the mode by LinuxCNC during loading.

HAL → INI Generator (EtherCAT Servo)

Load HAL

Save INI

☒ Gantry

Element	Detected
JOINTS	
SERVO	
cia402.0	joints=0 params=['pos-scale', 'csp-mode']
cia402.1	joints=1 params=['pos-scale', 'csp-mode']
cia402.2	joints=2 params=['pos-scale', 'csp-mode']
cia402.3	joints=3 params=['pos-scale', 'csp-mode']
VALIDATION	
Essential signals	
Axis cohesion	

EMC

☒ Enable

MACHINE

Generated_EtherCAT

DEBUG

0

VERSION

1.1

DISPLAY

☒ Enable

DISPLAY

axis

EDITOR

gedit

POSITION_OFFSET

RELATIVE

POSITION_FEEDBACK

ACTUAL

ARCDIVISION

64

GRIDS

10mm 20mm 50mm 100mm

MAX_FEED_OVERRIDE

1.2

DEFAULT_LINEAR_VELOCITY

5

MAX_ANGULAR_VELOCITY

50

MIN_LINEAR_VELOCITY

0

MAX_LINEAR_VELOCITY

50

CYCLE_TIME

0.100

INTRO_GRAPHIC

linuxcnc.gif

INTRO_TIME

1

INCREMENTS

5mm 1mm .5mm .1mm

KINS

☒ Enable

JOINTS

4

KINEMATICS

trivkins kinstype=both

TASK

☒ Enable

TASK

milltask

CYCLE_TIME

0.010

EMCMOT

☒ Enable

EMCMOT

motmod

COMM_TIMEOUT

1.0

SERVO_PERIOD

1000000

HOMEMOD

cia402_homecomp

HAL

☒ Enable

HALFILE

hahahal.hal

HALUI

halui

TRAJ

☒ Enable

COORDINATES

X Y Z

LINEAR_UNITS

mm

ANGULAR_UNITS

degree

DEFAULT_LINEAR_VELOCITY

5

MAX_LINEAR_VELOCITY

50

EMCIO

☒ Enable

EMCIO

io

CYCLE_TIME

0.100

RS274NGC

☒ Enable

PARAMETER_FILE

gcodeparam.var

AXIS

☒ Enable

MAX_VELOCITY

50

MAX_ACCELERATION

100

MIN_LIMIT

-1000

MAX_LIMIT

1000

JOINT

☒ Enable

TYPE

LINEAR

HOME

0

MIN_LIMIT

-1000

MAX_LIMIT

1000

MAX_VELOCITY

50

MAX_ACCELERATION

100

FERROR

1000

MIN_FERROR

1000

HOME_ABSOLUTE_ENCODER

2

[KINS]

JOINTS = 4

KINEMATICS = trivkins kinstype=both coordinates=XYZZ

[TASK]

TASK = milltask

CYCLE_TIME = 0.010

[EMCMOT]

EMCMOT = motmod

COMM_TIMEOUT = 1.0

SERVO_PERIOD = 1000000

HOMEMOD = cia402_homecomp

[TRAJ]

COORDINATES = X Y Z

LINEAR_UNITS = mm

ANGULAR_UNITS = degree

DEFAULT_LINEAR_VELOCITY = 5

MAX_LINEAR_VELOCITY = 50

[HAL]

HALFILE = hahahal.hal

HALUI = halui

[EMCIO]

EMCIO = io

CYCLE_TIME = 0.100

[RS274NGC]

PARAMETER_FILE = gcodeparam.var

[AXIS_X]

MAX_VELOCITY = 50

MAX_ACCELERATION = 100

MIN_LIMIT = -1000

MAX_LIMIT = 1000

[JOINT_0]

TYPE = LINEAR

HOME = 0

MIN_LIMIT = -1000

MAX_LIMIT = 1000

MAX_VELOCITY = 50

MAX_ACCELERATION = 100

FERROR = 1000

MIN_FERROR = 1000

HOME_ABSOLUTE_ENCODER = 2

[AXIS_Y]

MAX_VELOCITY = 50

MAX_ACCELERATION = 100

MIN_LIMIT = -1000

MAX_LIMIT = 1000

[JOINT_1]

TYPE = LINEAR

HOME = 0

MIN_LIMIT = -1000

MAX_LIMIT = 1000

MAX_VELOCITY = 50

3.3. Save INI

INI files

4. DosStyle → UTF-8 LF Converter

4.1 When files are saved in the programs presented above on Windows, DosStyle line endings are created. It is enough to enable the Converter, enter the given folder with the files, or load the files individually, or paste the file path, and press convert.



