1 Introduction

This document is intended to provide some basic documentation for the use of electrontics.gle for drawing circuit diagrams. It is currently a bit basic, but will hopefully be added to at a later date.

2 Functions

The following is a list of all the functions available, along with their options. The meanings of the various options will (hopefully) become self-explanatory with the examples that follow in the next section.

@connection
@resistor_h rlabel$
@resistor_v rlabel$
@potentiometer_hb rlabel$
@potentiometer_vr rlabel$
@vresistor_h rlabel$
@vresistor_v rlabel$
@npn_bjt bjtlable$  
@pnp_bjt bjtlable$
@n_mosfet mlable$
@p_mosfet mlable$
@igbt igtlable$
@inductor_h core ilabel$
@inductor_v core ilabel$
@xformer core type
@xformer_dblsecondary type location
@p_capacitor polarity
3 Symbols

This section gives a list of the various symbols that can be produced with the provided functions. The symbol ‘s’ refers to the start point for drawing and ‘e’ refers to the end point.

```plaintext
@resistor_h "R_1"
```
amove 2 5
@resistor_v "R_1"

amove 1 3
@potentiometer_hb "R_1"

amove 2 5
@potentiometer_vr "R_1"

amove 1 2
@vresistor_h "R_1"

amove 2 5
@vresistor_v "R_1"
amove 1 2
@nnp_bjt "Q_1"

amove 1 2
@pnp_bjt "Q_1"

amove 1 2
@n_mosfet "Q_1"

amove 1 2
@p_mosfet "Q_1"

amove 1 2
@igbt "Q_1"

amove 1 2
@inductor_h 1 "L_1"
amove 2 5
@inductor_v 1 "L_1"

amove 1 2
@inductor_h 0 "L_1"

amove 2 5
@inductor_v 0 "L_1"

amove 1 5
@xformer 1 0 "20" "30"

amove 1 5
@xformer 1 1 "20" "30"
ameove 1 5
@xformer 1 2 "20" "30"

ameove 1 5
@xformer 0 0 "20" "30"

ameove 1 5
@xformer 0 1 "20" "30"

ameove 1 5
@xformer 0 2 "20" "30"
amove 1 8
@xformer_dblsecondary 0 0

amove 1 8
@xformer_dblsecondary 1 0
amove 1 8
@xformer_dblsecondary 2 0

amove 1 5
@xformer_dblsecondary 0 1
amove 1 5
@xformer_dblsecondary 1 1

amove 1 5
@xformer_dblsecondary 2 1
amove 1 11
@xformer_dblsecondary 2 2

amove 1 2
@p_capacitor.hl "C_1"

amove 1 2
@p_capacitor.hr "C_1"

amove 2 5
@p_capacitor_vt "C_1"
amove 2 5  
@p_capacitor_vb "C_1"

amove 1 2  
@capacitor_h "C_1"

amove 2 5  
@capacitor_v "C_1"

amove 1 2  
@vcapacitor_h "C_1"

amove 2 5  
@vcapacitor_v "C_1"
ameove 1 2
@diode_hr "D_1"

ameove 1 2
@diode_hl "D_1"

ameove 2 5
@diode_vd "D_1"

ameove 2 5
@diode_vu "D_1"

ameove 1 4
@bridge_rectifier "B_1"
amove 1 4
@opamp 1 "U_1"

amove 1 4
@opamp 0 "U_1"

amove 1 2
@ground

amove 1 2
@supply_h 0

amove 2 5
@supply_v 0

amove 1 2
@supply_h 1
amove 2 5
@supply_v 1

amove 1 2
@supply_h 2

amove 2 5
@supply_v 2

amove 1 2
@cell_h "E_1"

amove 2 5
@cell_v "E_1"
s,e

amove 1 4
@and

s,e

amove 1 4
@nand

s,e

amove 1 4
@or

s,e

amove 1 4
@nor

s,e

amove 1 4
@xor
4 Examples

This section gives a few examples of real circuits that have been drawn with this package.
! Example circuit with electronics.gle
size 20 7.5
include electronics.gle

begin scale 0.5 0.5
  termrad = 0.25
  amove 1 3
  rmove -termrad 0
circle termrad
  rmove termrad 0
  rline 35 0
  rmove termrad 0
circle termrad
  amove 1 6
  rmove -termrad 0
circle termrad
  rmove termrad 0
  rline 1 0
  @resistor_h "R_1"
  @nnp_bjt "Q_1"
  rmove 2 -1
  rline 0 -2
  @connection
  rmove 0 4
  rline 0 1
  @connection
  rmove 0 5
  @connection
  rline 0 -1
  @resistor_v "R_2"
  rline 2 0
  @connection
  rline 0 2
  @nnp_bjt "Q_2"
  rmove 0 -2
  rline 0 -2
  @pnp_bjt "Q_3"
  rmove 2 -1
  rline 0 -2
  @connection
  rmove 0 4
  rline 0 2
  rmove 0 2
  rline 0 2
  @connection
  rmove 0 -5
  @connection
  @capacitor_h "C_1"
  rmove 0 5
  @connection
  rline 0 -1
  @resistor_v "R_3"
  @connection
  rline 1 0
  @connection
  resistor_v "R_4"
  rline 0 -1
  @connection
  rmove 0 5
! Three-phase inverter
size 13 10

include electronics.gle

begin scale 0.5 0.5

! Draw the DC Link
amove 1 19
rline 24 0

! Draw Ground
amove 1 11
rline 2 0
@connection
@ground
rline 22 0

! Transistors
for i = 0 to 16 step 8
    for j = 0 to 4 step 4
        amove 2 13
        rmove i j
        @ight ""
        rmove 2 1
        rline 0 1
        rmove 0 −3
        rline 0 −1
        rmove 2 4
        @diode_vu ""
    next j
next i
! Connection points
amove 4 11
for i = 0 to 16 step 8
  for j = 0 to 8 step 4
    amove 4 11
    rmove i j
    @connection
    rmove 2 0
    @connection
  next j
next i

! Machine windings
amove 12 15
rline 4 0
rline 0 −6
@inductor_v 0 ""
@connection
star_x = xpos()
star_y = ypos()
begi begin rotate −30
   @inductor_h 0 ""
end rotate
rmove 4*cos(torad(30)) −4*sin(torad(30))
ext_y = ypos()
line 24 end_y
line 24 15
rline −4 0
amove star_x star_y
begi begin rotate 210
   @inductor_h 0 ""
end rotate
rmove −4*cos(torad(30)) −4*sin(torad(30))
line 8 end_y
line 8 15
rline −4 0
end scale

! Example of logic gate use: SR Flip-Flop

size 19 14
include electronics.gle

! Radius of end terminals
termrad = 0.25

! Reset input
amove 4 2
rmove -termrad 0
circle termrad
rmove -2*termrad 0
set just RC
text RESET
rmove 3*termrad 0
rline 2 0

! Set input
amove 4 12
rmove -termrad 0
circle termrad
rmove -2*termrad 0
set just RC
text SET
rmove 3*termrad 0
rline 2 0

! Top NAND Gate
@nand
rmove 0 -2
rline 0 -2
rmove 0 -2
rline 0 -2
! Bottom NAND Gate
@nand

! Interconnections
rmove 6 -1
rline 1 0
@connection
rline 0 2
rline -7 3
rmove 0 -2
rline 7 3
rline 0 2
@connection
rline -1 0
rmove 1 0

! Top Output
rline 2 0
rmove termrad 0
circle termrad
rmove 2*termrad 0
set just LC
text Q

! Bottom Output
rmove 0 -8
text !Q
rmove -2*termrad 0
circle termrad
rmove -termrad 0
rline -2 0
! An H-Bridge

! Set the page size
size 21 10

! Import the electronics module
include electronics.gle

! Draw a grid if the line below is uncommented
! @drawgrid xscale

! Top left of diagram
amove 2 9
gsave

! Battery leg
rline 0 -2
@cell_v "E_1"
rline 0 -2

! Ground plane
rline 17 0

! Return to top left
grestore

! Power to cap leg
rline 4 0
@connection
rline 0 -2
@p_capacitor_vt "C_1"
rline 0 -2
@connection

! Back to power rail
rmove 0 8

! Power to First Leg
rline 5 0
@connection
rline 0 -1
rmove -2 -1
@n_mosfet "Q_1"
rmove 2 -1
rline 0 -1
@connection
@diode_vu "D_1"
@connection

! Back to Power rail
remove 0 8

! Power to second leg
rline 8 0
@diode_vu "D_2"
@connection
rline 0 -1
remove -2 -1
@n_mosfet "Q_2"
remove 2 -1
rline 0 -1

! Back to right hand side of load
remove 0 4

! Connections to load
rline -2 0
remove -4 0
rline -2 0
remove 2 -1

! Load
box 4 2
remove 2 1
set just CC
text LOAD