Beautiful wiring documentation with

WireViz

Daniel Rojas / formatc1702 - FOSDEM 2025 - 2025-02-02

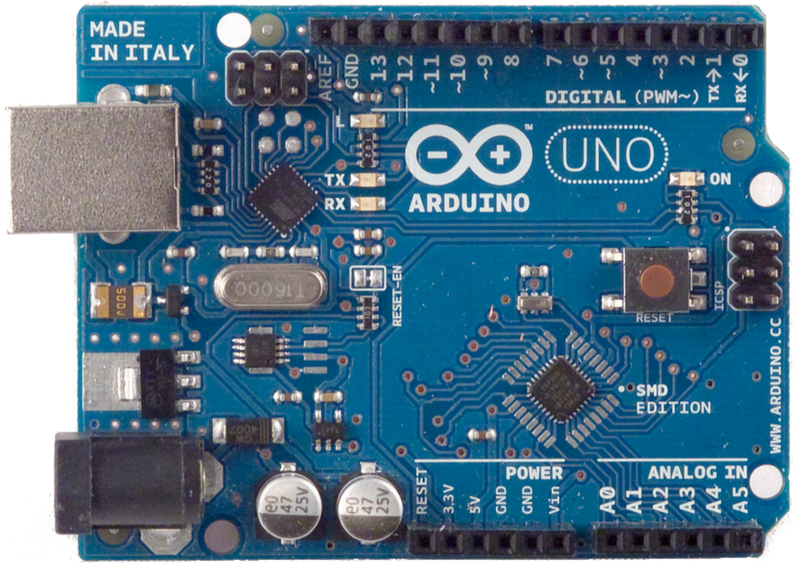
Electrical documentation

Electrical documentation

PCB level

Electrical documentation

PCB level



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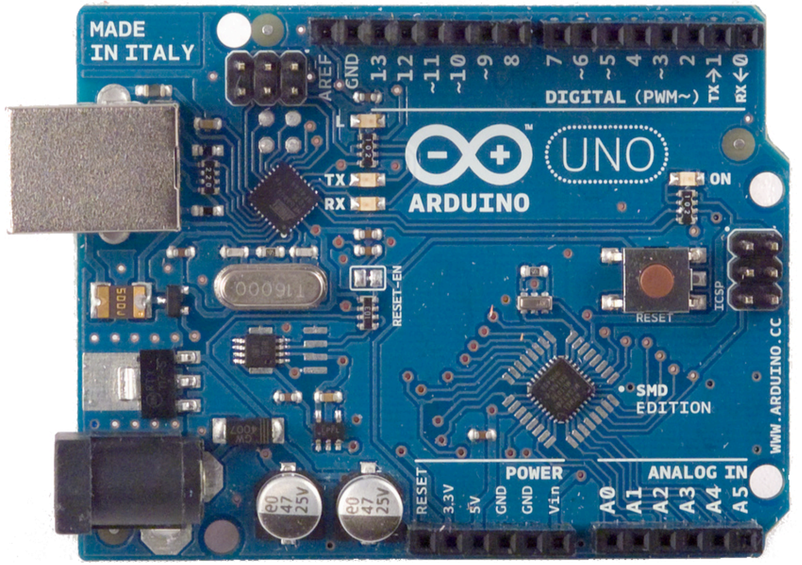
e.g. KiCad



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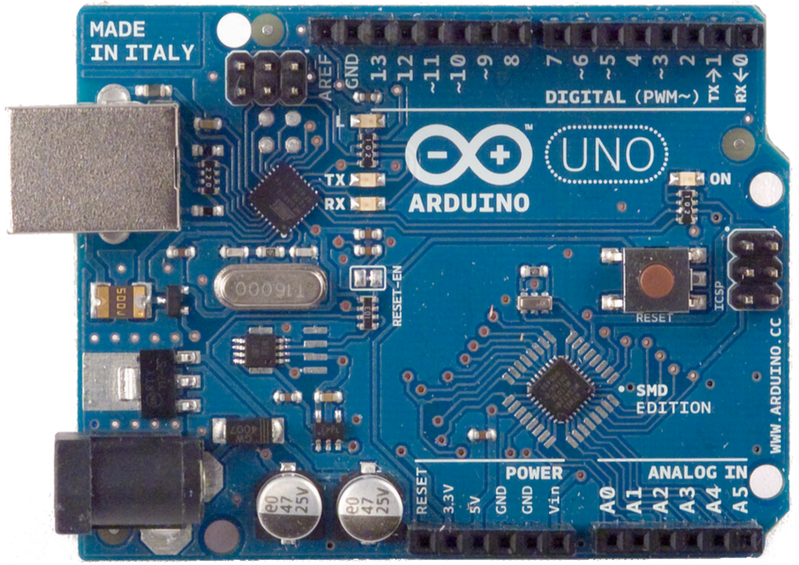

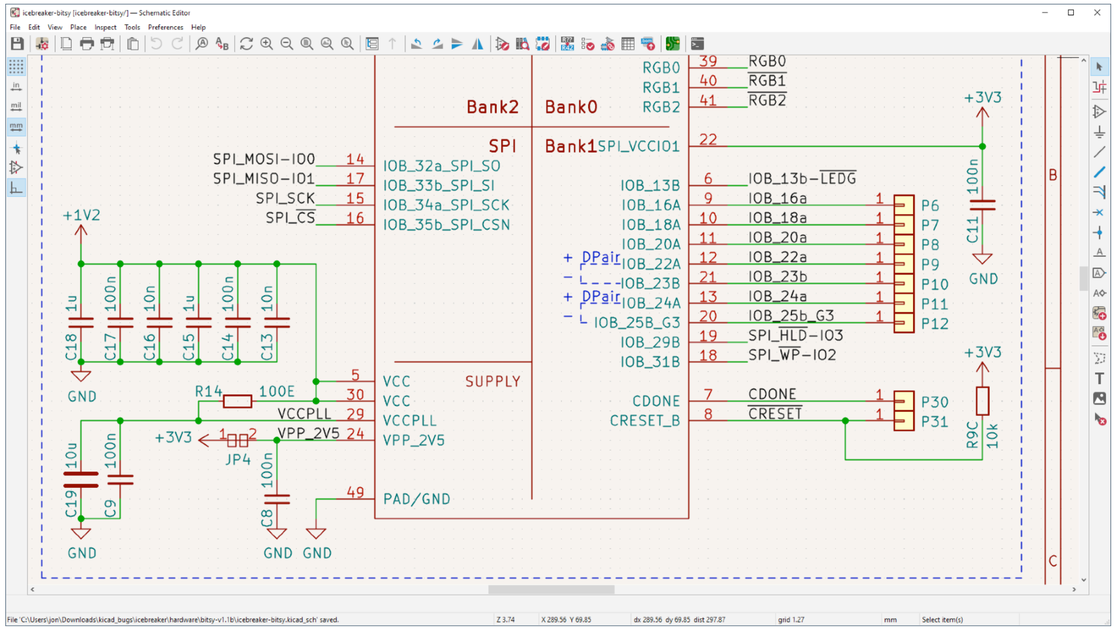

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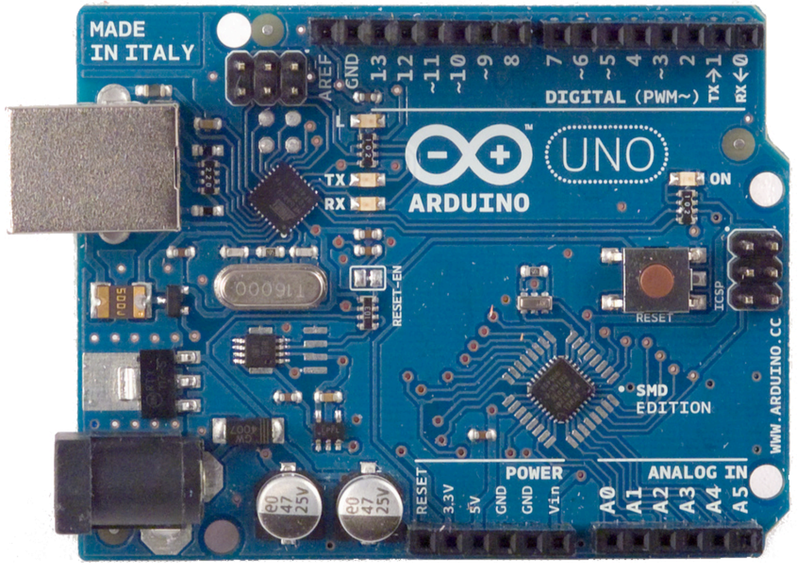

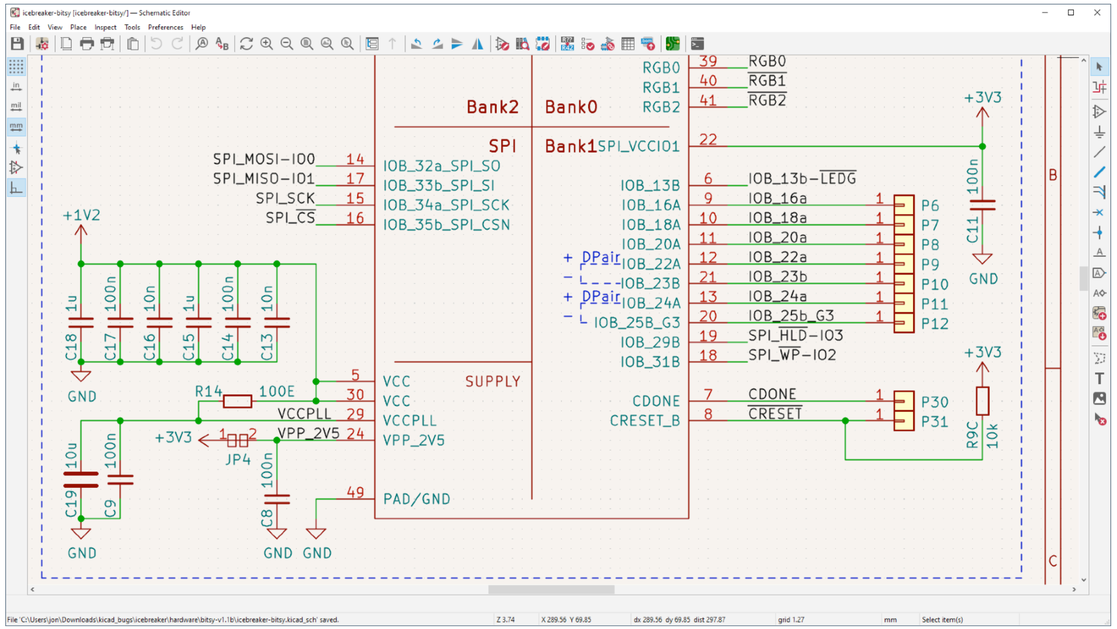

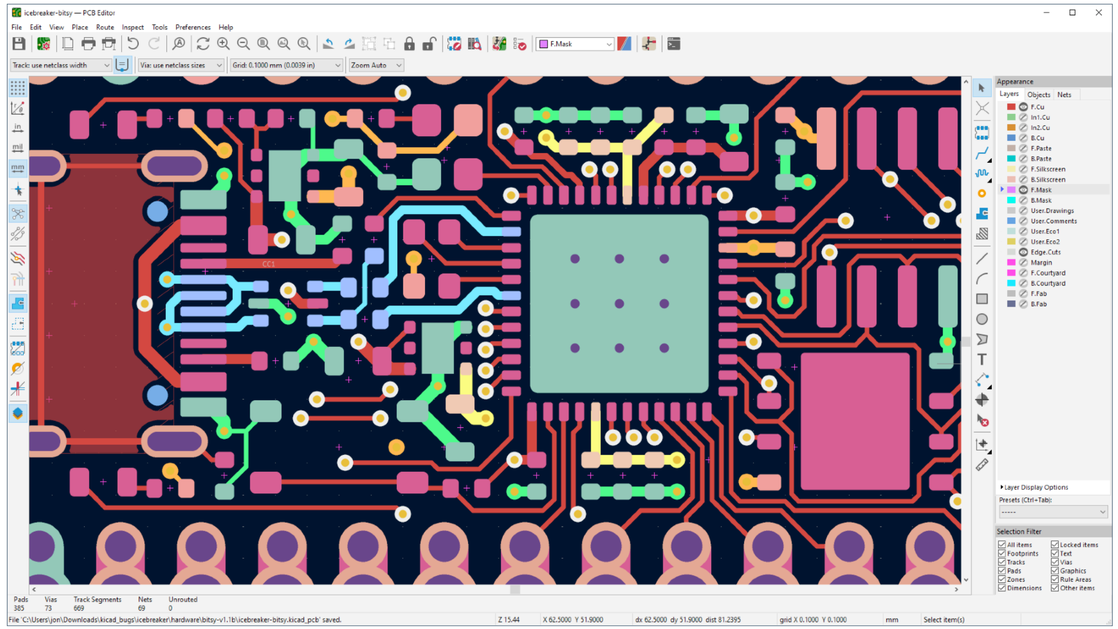

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e.g. KiCad

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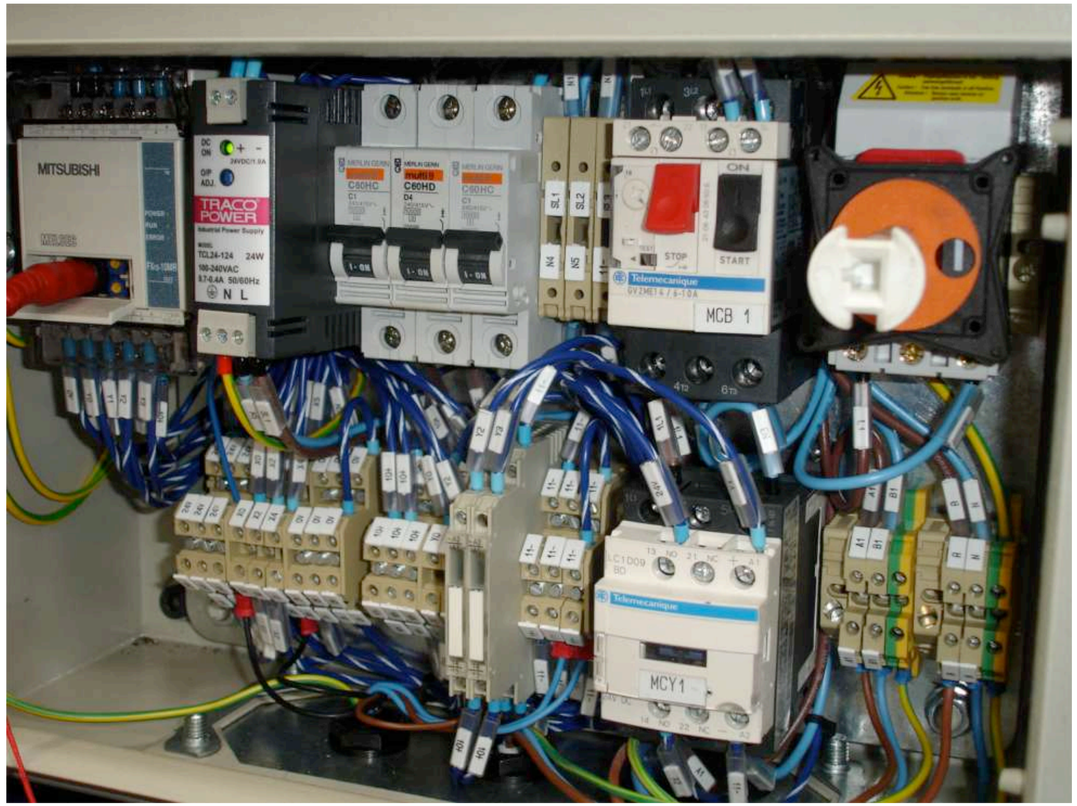

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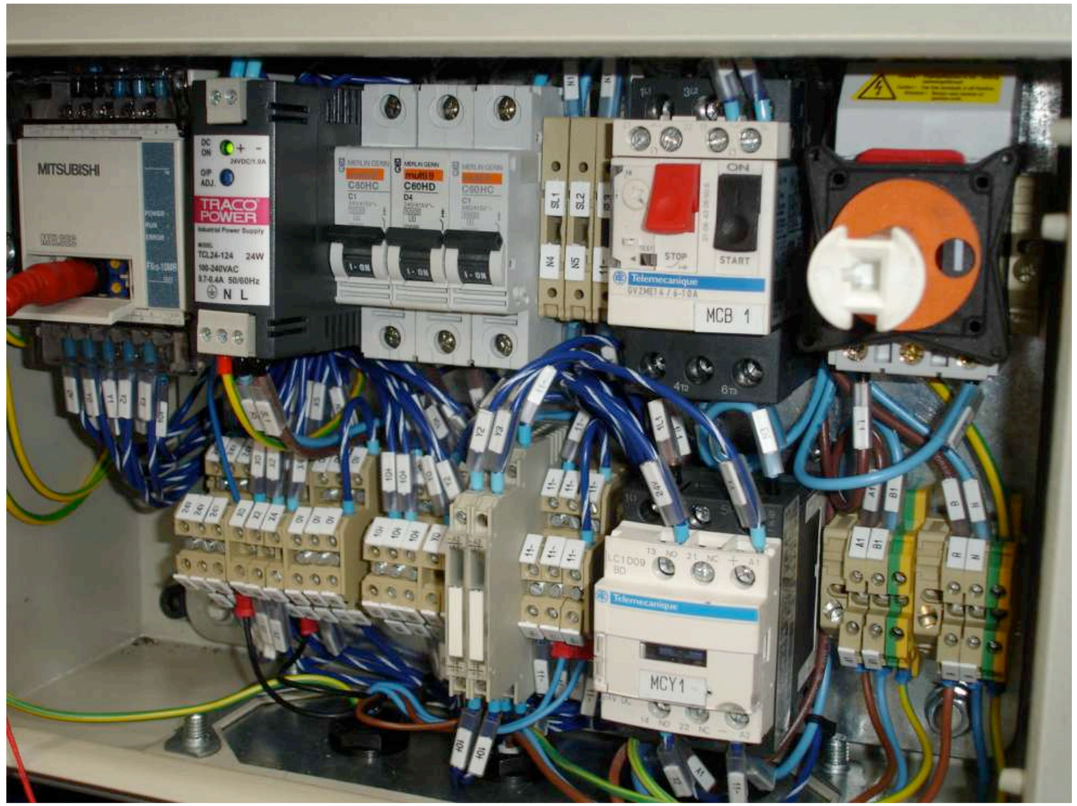
e.g. KiCad

e.g. QElectroTech



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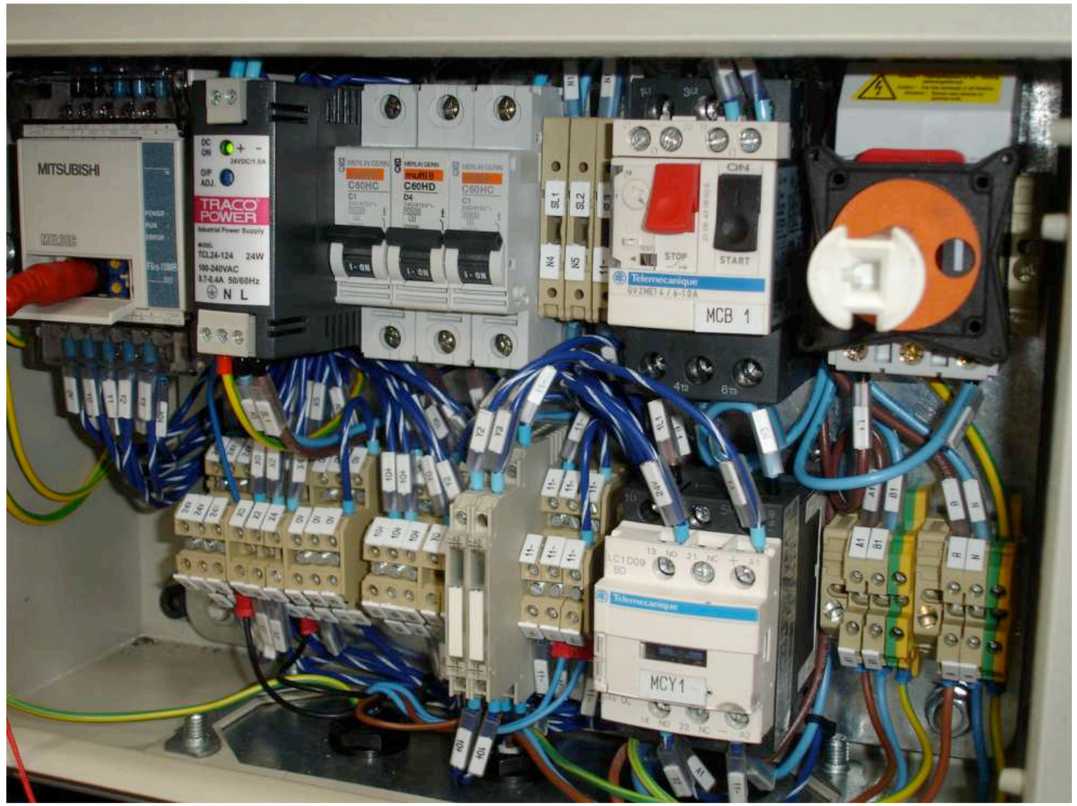

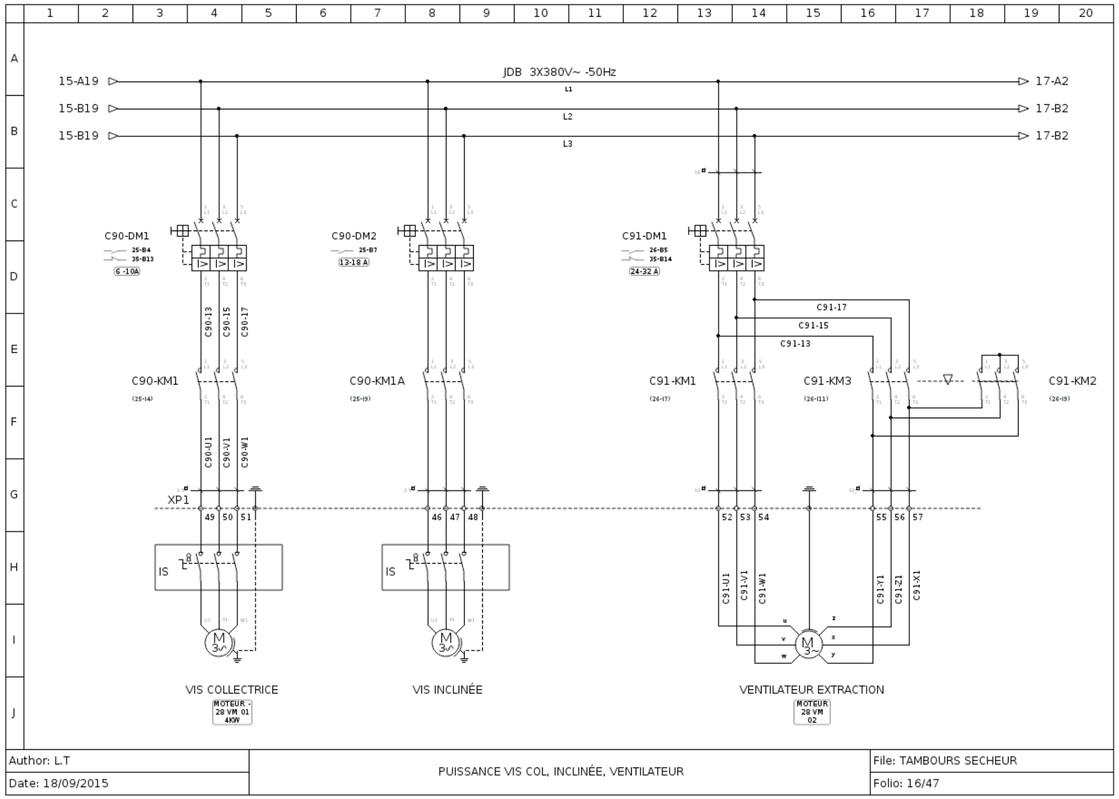

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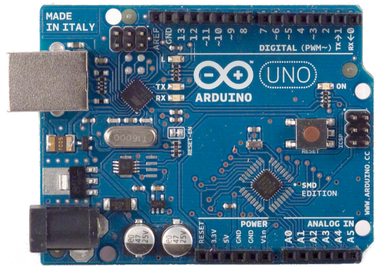
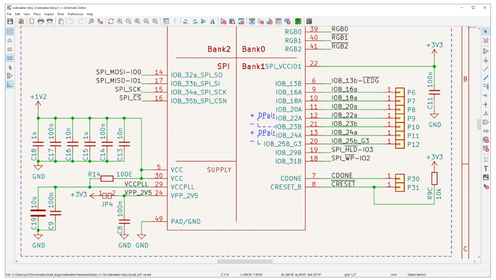
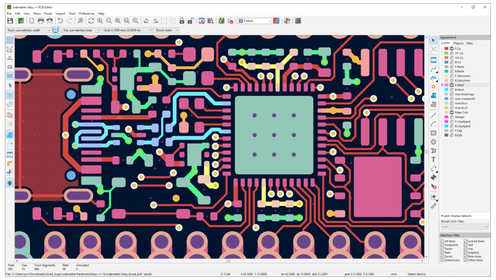
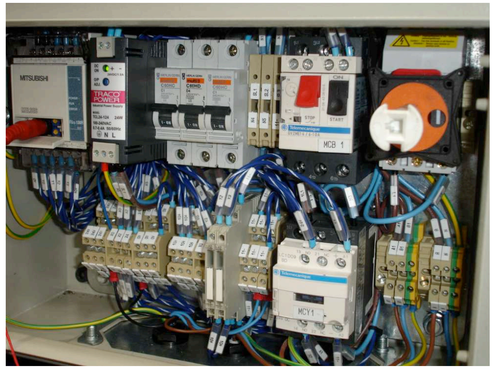
PCB level ⟷ Cable level ⟷ System level

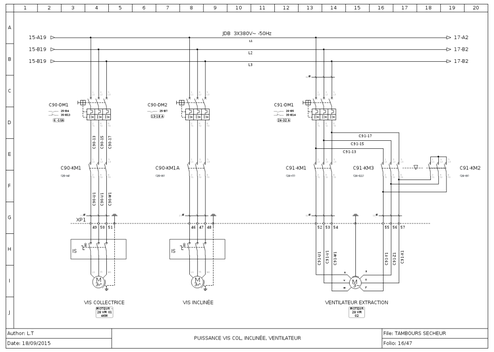
e.g. KiCad — e.g. QElectroTech











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e.g. KiCad — e.g. QElectroTech

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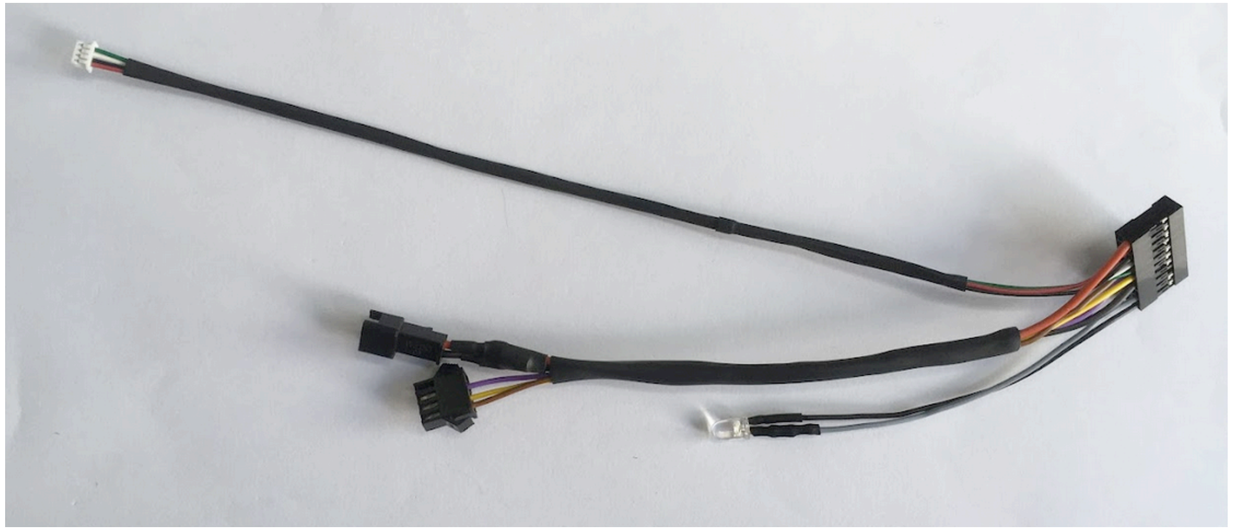

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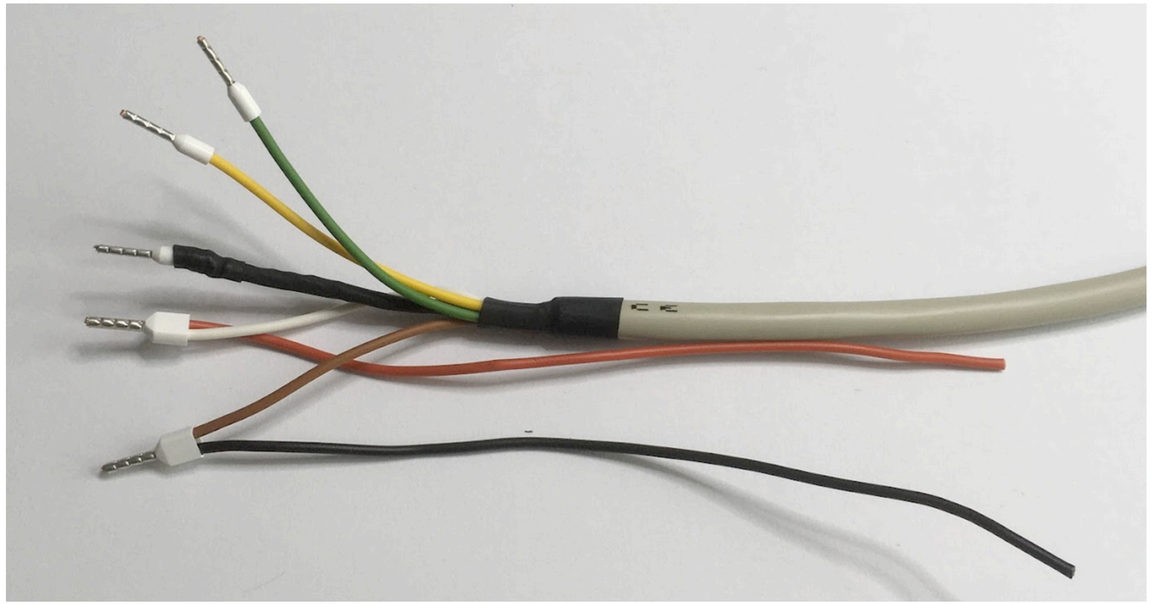

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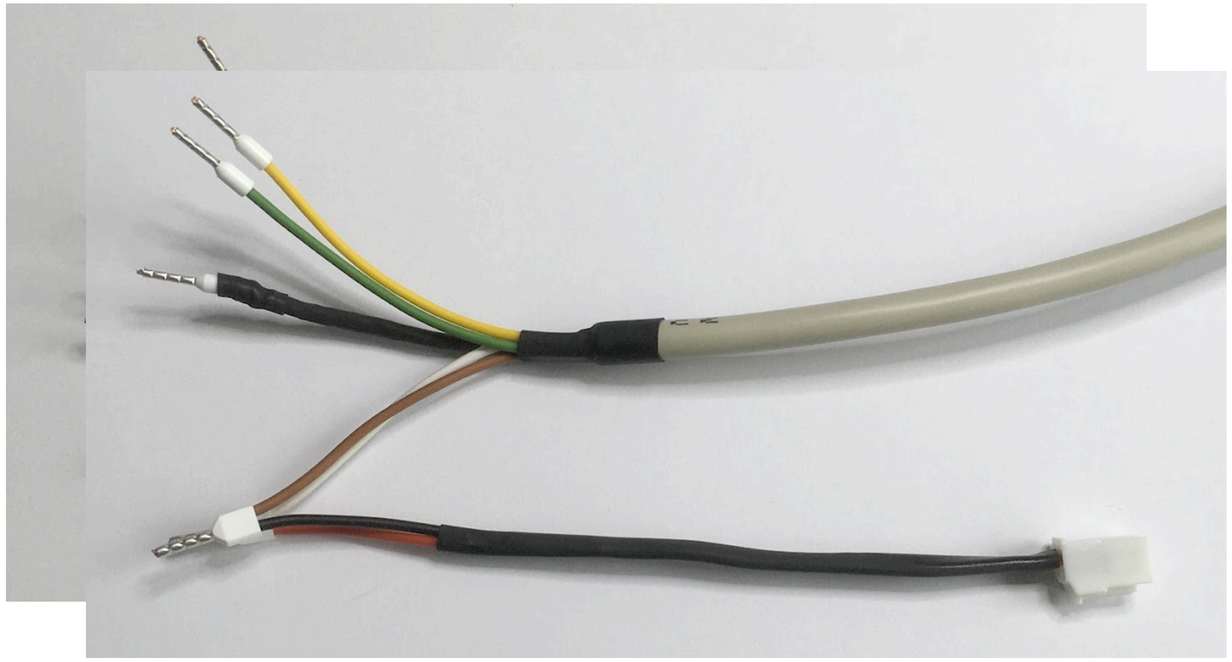

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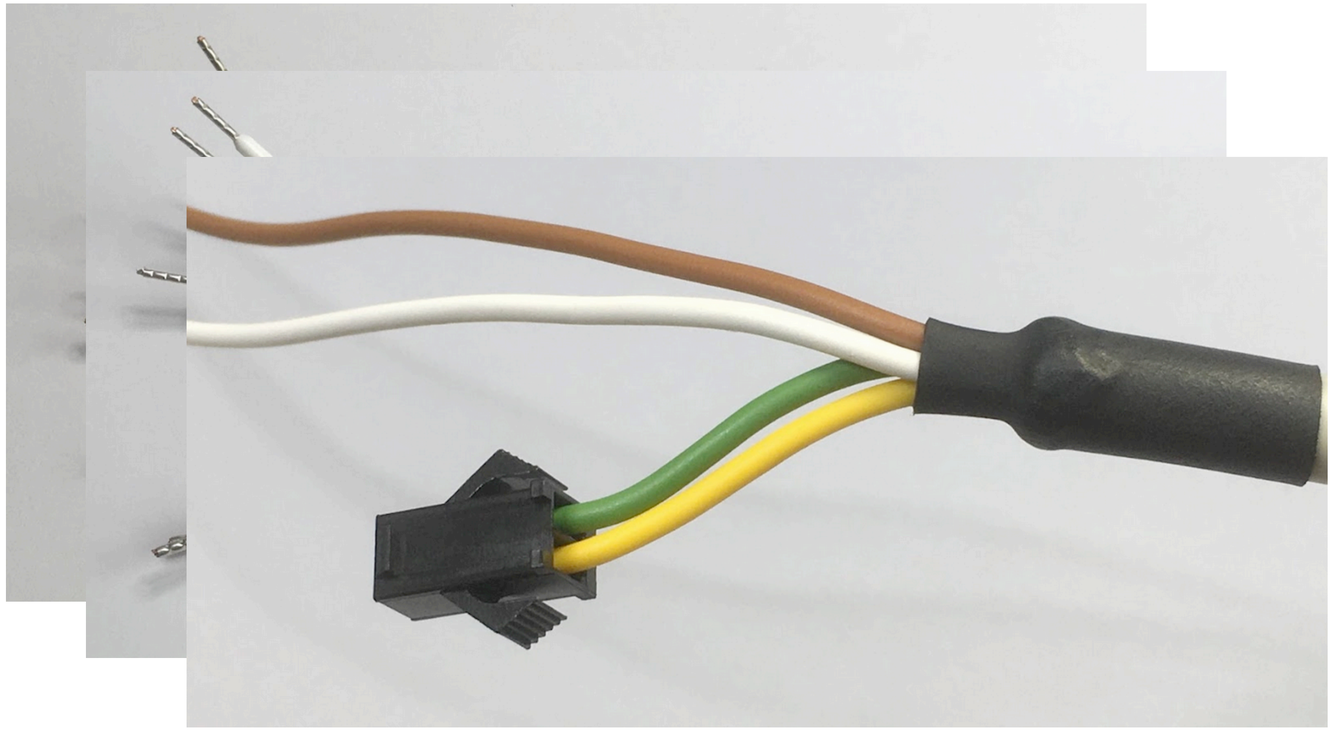

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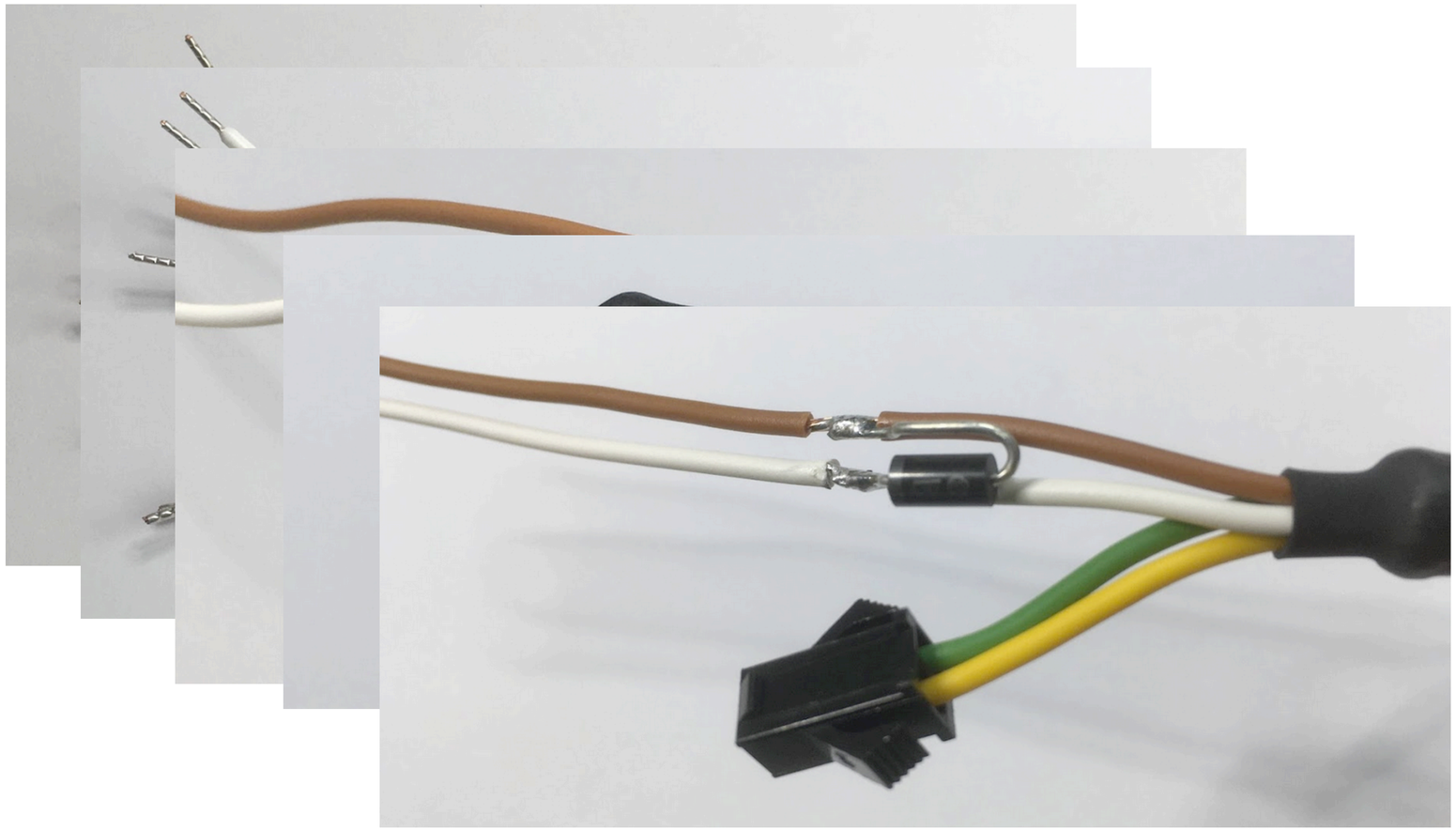

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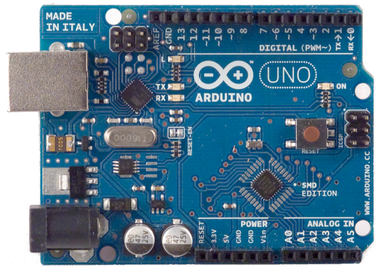

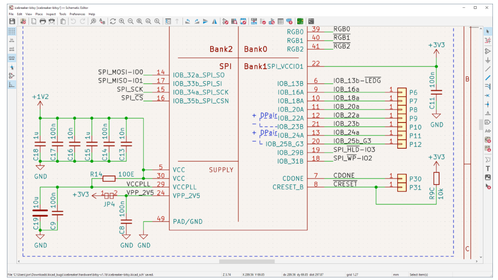

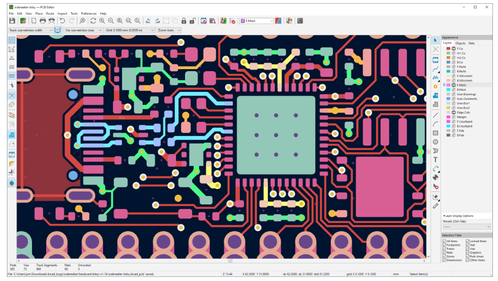

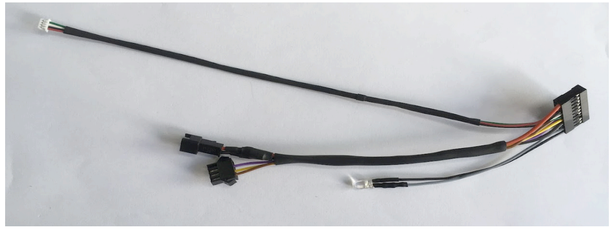

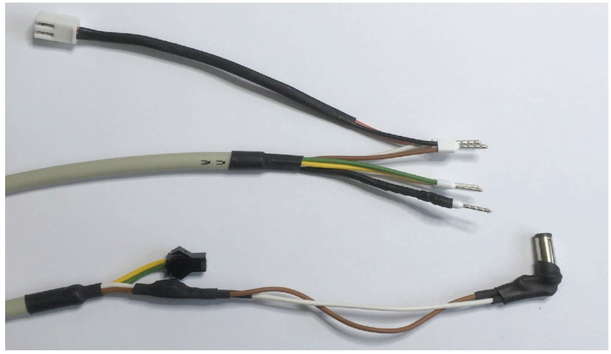

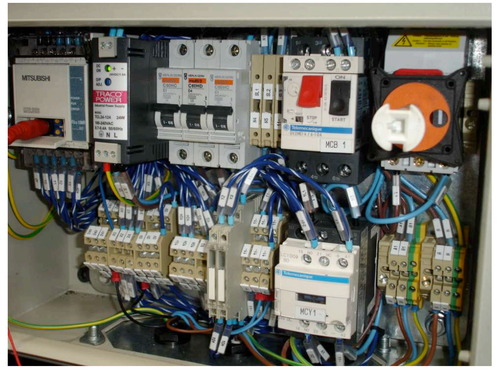

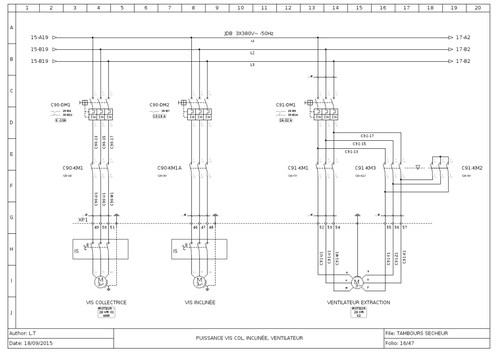

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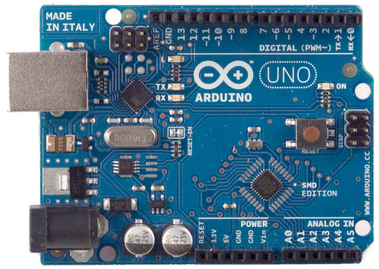
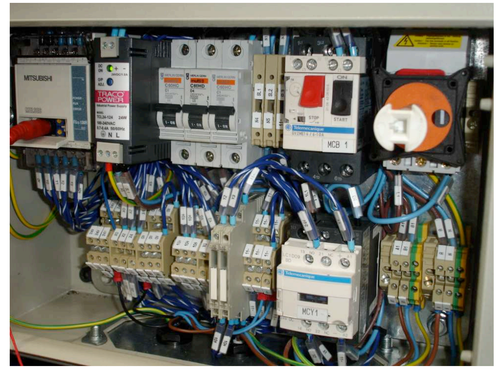
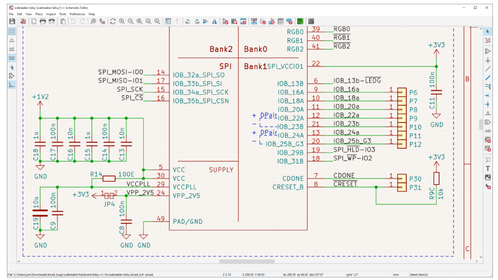
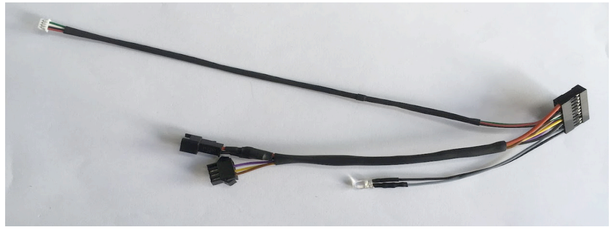
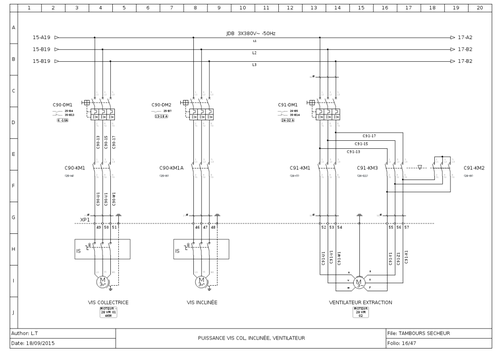
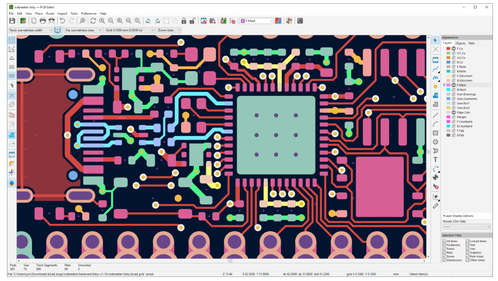


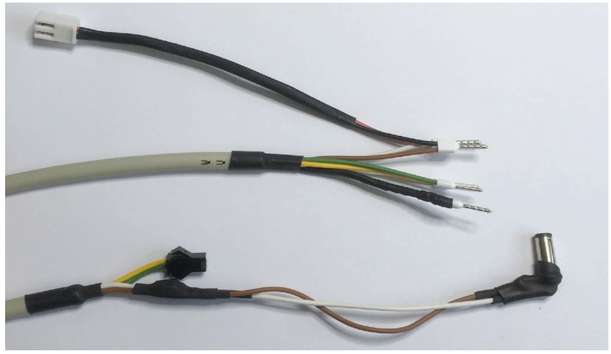










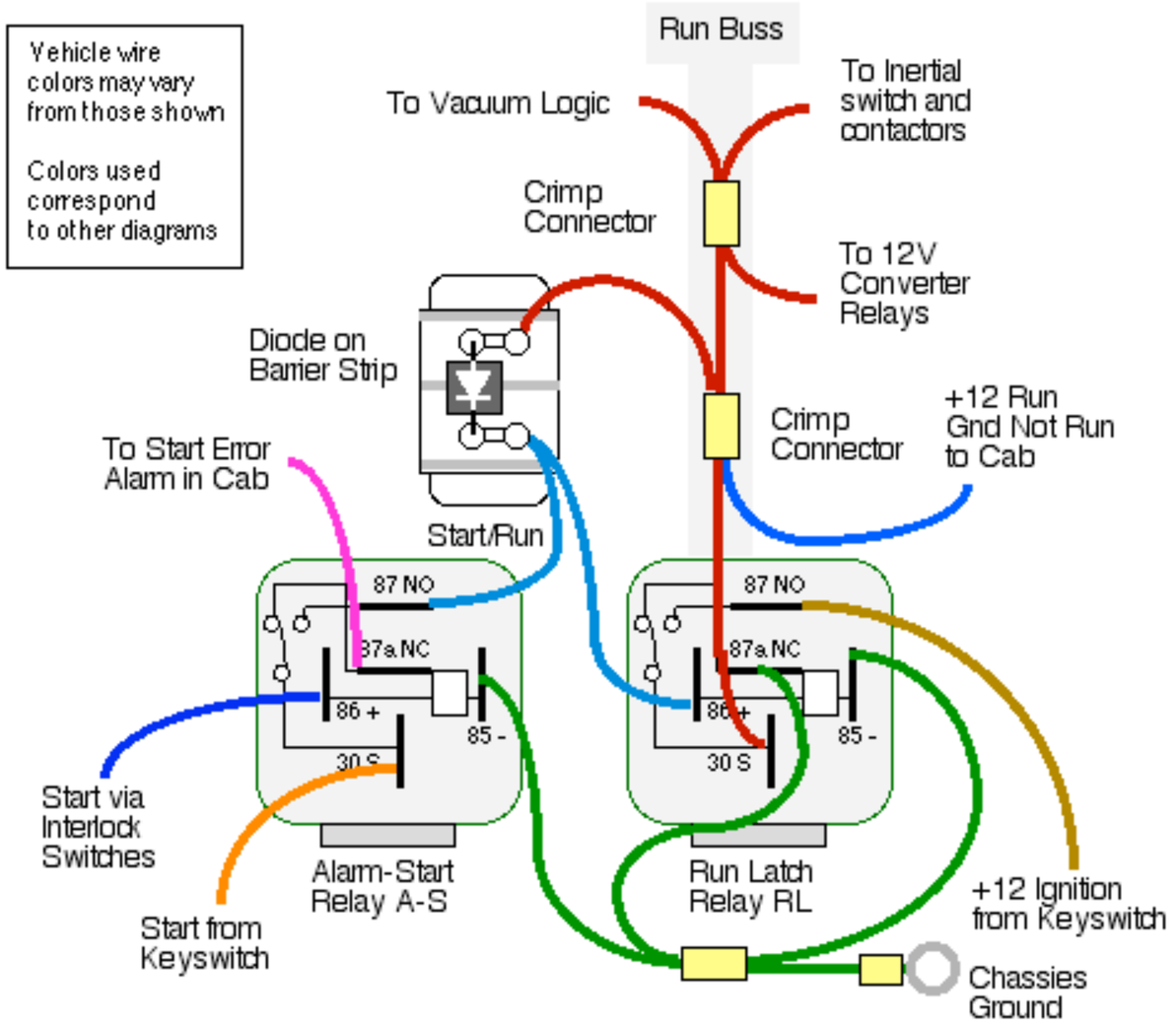


Previous approaches

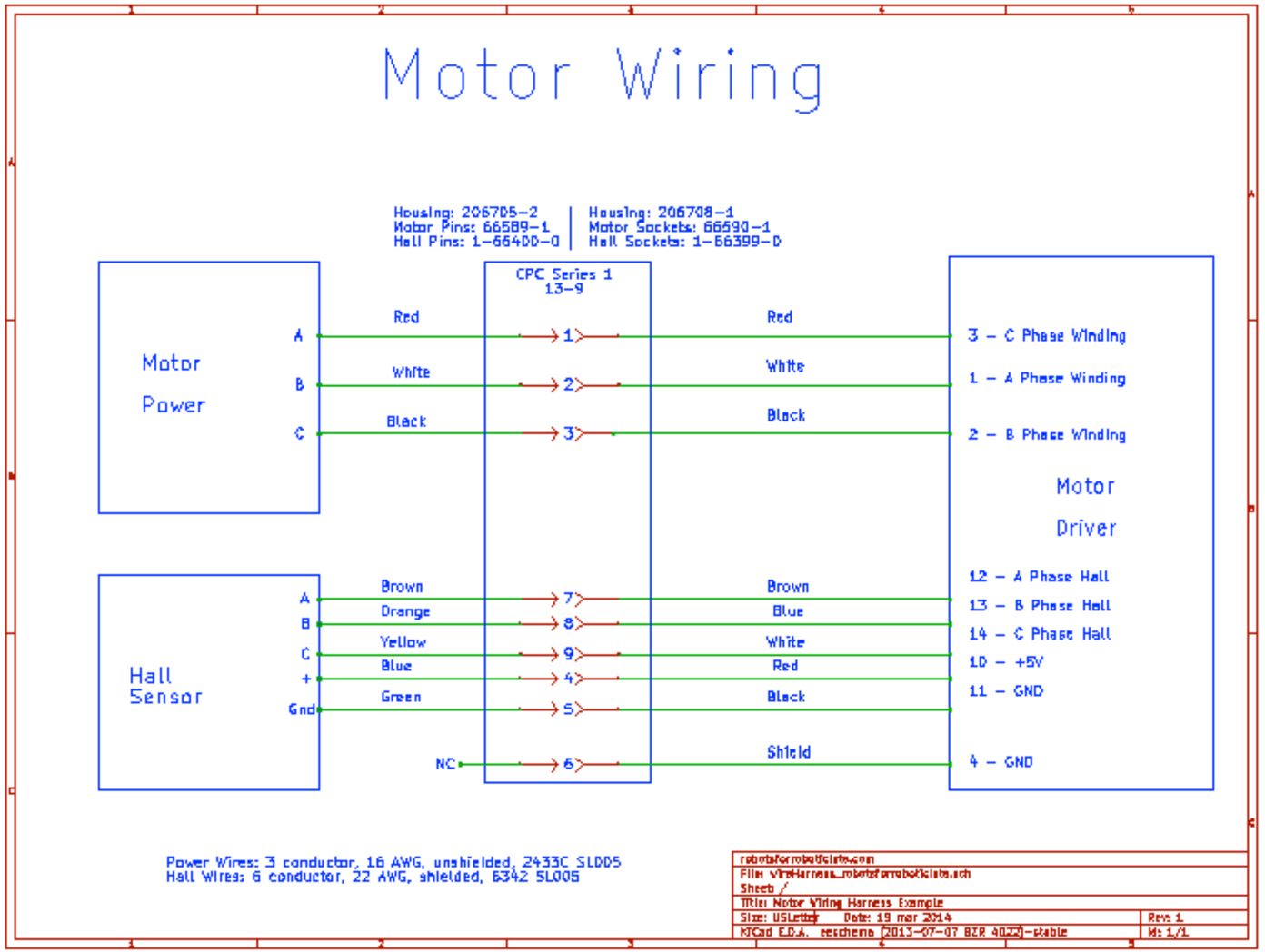
Previous approaches

	Server Side	Terminal Side		
Signal	**Console Port (DTE) RJ-45**	**Adapter DB-9 Pin**	**Adapter DB-25 Pin**	**Signal**
RTS	1	8	5	CTS
DTR	2	6	6	DSR
TxD	3	2	3	RxD
Ground	4	5	7	Ground
Ground	5	5	7	Ground
RxD	6	3	2	TxD
DSR	7	4	20	DTR
CTS	8	7	4	RTS

Previous approaches



Previous approaches

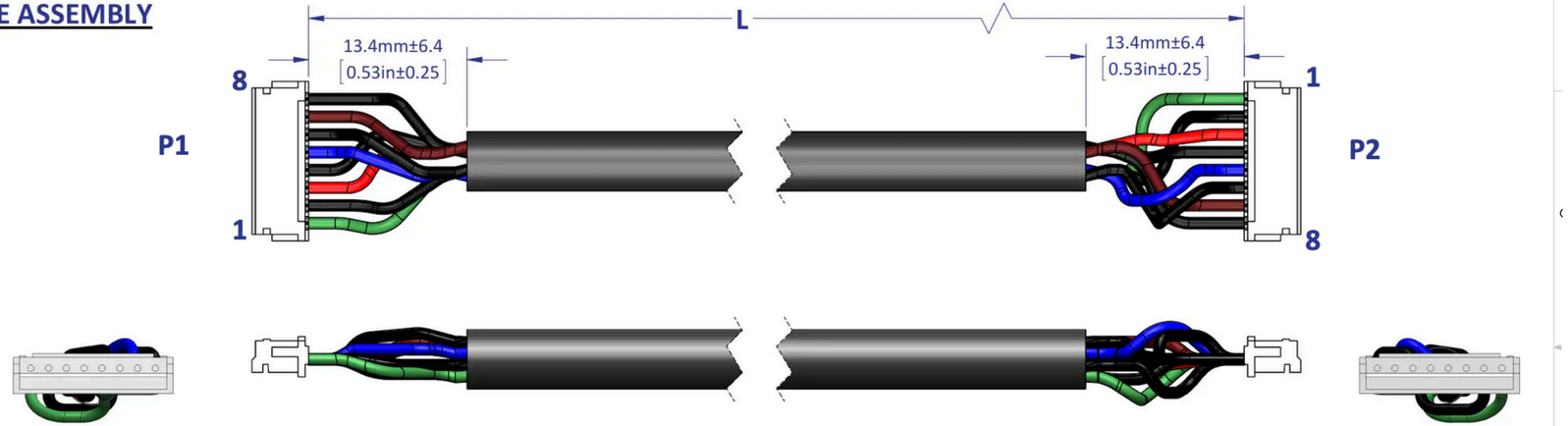


Previous approaches

ITEM NO.	PartNo	DESCRIPTION	QTY.
1	JST PN: ZHR-8	Conn Housing ZH 8Pos 1.5mm White	2
2	JST PN: SZH-002T-P0.5	Conn Term Crimp ZH 26-28 Awg	16
3	Custom (N/A)	Twisted Pair Cable	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
C	CHANGED CABLE ASSEMBLY TO HOOK-UP WIRE/SHRINK TUBING TYPE CONSTRUCTION. ADDED SHEET #4.	2/3/2015	WLI DAA
C1	1) UPDATED FILENAME. 2) CHANGED CABLE LENGTH TOLERANCE TO +0/-25.4mm.	4/1/2015	WLI DAA

CABLE ASSEMBLY



CABLE ASSEMBLY PART NUMBERS	
Part Number	**Cable Length "L" (tolerance: +0/-25.4mm[1.0in])**
1800-0003	304.8mm [12in]
1800-0004	457.2mm [18in]
1800-0005	609.6mm [24in]
1800-0006	762.0mm [30in]
1800-0007	914.4 mm [36in]

NOTES:
1. TOLERANCE BLOCK DOES NOT APPLY.
2. SEE SHEET #2 FOR CABLE ASSEMBLY SPECS.
3. SEE SHEET #3 FOR CONNECTOR SPECS.
4. SEE SHEET #4 FOR CABLE + CONNECTORS ASSEMBLY SPECS.

Wire Code		
P1		**P2**
1	Green	1
2	Black	2
3	Red	3
4	Black	4
5	Blue	5
6	Black	6
7	Brown	7
8	Black	8

WireViz

WireViz

Input: demo.yml

WireViz

Input: demo.yml

```
connectors:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
```

WireViz

Input: demo.yml

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connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
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    length: 0.2  # [m]
    gauge: 0.25 mm2
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    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
```

WireViz

Input: demo.yml

```yaml
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    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
    - X1: [  1]
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
    - X1: [  1]
    - C1: [  1]
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
    - X1: [  1]
    - C1: [  1]
    - X2: [GND]
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
    - X1: [  1, 2]
    - C1: [  1, 2]
    - X2: [GND,RX]
```

WireViz

Input: demo.yml

```yaml
connectors:
  X1:
    type: Molex KK254
    subtype: plug
    pincount: 3
  X2:
    type: JST PH
    subtype: plug
    pinlabels:
      - GND
      - TX
      - RX
```

```yaml
cables:
  C1:
    wirecount: 3
    length: 0.2  # [m]
    gauge: 0.25 mm2
    show_equiv: true
    color: GY
    color_code: DIN
    manufacturer: ACME
    mpn: 20230325
    show_name: false
```

```yaml
connections:
  -
    - X1: [  1, 2, 3]
    - C1: [  1, 2, 3]
    - X2: [GND,RX,TX]
```

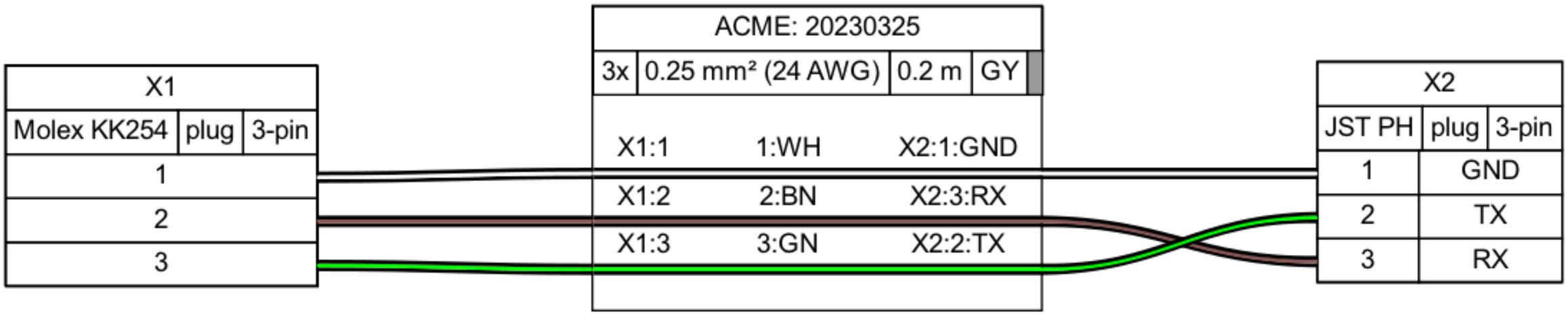
WireViz

```
$ wireviz demo.yml
```

WireViz

Output: demo.png

```
$ wireviz demo.yml
```



WireViz

WireViz

- Text based → easy editing, easy version control

WireViz

- Text based → easy editing, easy version control
- Auto-generated and auto-layouted graphics

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- Understands color codes (EN/DE), AWG ↔ mm² conversion

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WireViz

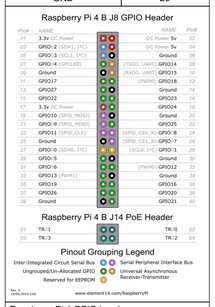
- Text based → easy editing, easy version control
- Auto-generated and auto-layouted graphics
- Understands color codes (EN/DE), AWG ↔ mm² conversion
- BOM generation
- Metadata & title blocks
- Reusable templates

WireViz

- Text based → easy editing, easy version control
- Auto-generated and auto-layouted graphics
- Understands color codes (EN/DE), AWG ↔ mm² conversion
- BOM generation
- Metadata & title blocks
- Reusable templates
- Open source (GPLv3)

Complex example

Pin header	male	40-pin
3.3V		1
5V		2
GPIO 2		3
5V		4
GPIO 3		5
GND		6
GPIO 4		7
TXD0		8
GND		9
RXD0		10
GPIO 17		11
GPIO 18		12
GPIO 27		13
GND		14
GPIO 22		15
GPIO 23		16
3.3V		17
GPIO 24		18
GPIO 10		19
GND		20



Raspberry Pi 4 GPIO header

For reference only; not part of cable assembly.

X1		
P/N: 609-2369-ND	Amphenol: 65043-027LF	
Mini-PV	female	20-pin
1	3.3V	1
2	5V IN	2
3	N/C	3
4	RFID 5V	4
5	N/C	5
6	RFID GND	6
7	N/C	7
8	RFID TXD0	8
9	QCL GND	9
10	RFID RXD0	10
11	QCL ON/OFF	11
12	QCL INTERLOCK	12
13	N/C	13
14	GND IN	14
15	N/C	15
16	N/C	16
17	N/C	17
18	LED LASER	18
19	N/C	19
20	GND	20

Additional components

11 x Crimp
P/N: 609-3614-1-ND, Amphenol: 47649-000LF

to Raspberry Pi GPIO header

attach to pins 1 through 20

W1			
LiYv	4x	0.14 mm² (26 AWG)	0.25 m
X1:4:RFID 5V	RD	X2:1:VCC	
X1:6:RFID GND	BK	X2:2:GND	
X1:8:RFID TXD0	WH	X2:3:RX IN	
X1:10:RFID RXD0	GN	X2:4:TX OUT	

Additional components

0.2 m x Heatshrink D3 (3:1)
Qualtek: Q2-F3X-1/8-01

W2			
LiYv	3x	0.25 mm² (24 AWG)	0.17 m
X1:9:QCL GND	BN	X3:1:GND	
X1:12:QCL INTERLOCK	YE	X3:2:INTERLOCK	
X1:11:QCL ON/OFF	VT	X3:3:ON/OFF	

Additional components

0.14 m x Heatshrink D6 (3:1)
Qualtek: Q2-F3X-1/4-01

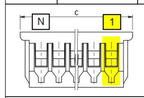
Heatshrink together with W3

W3			
LiYv	2x	0.5 mm² (21 AWG)	0.17 m
X1:2:5V IN	RD	X4:1	
X1:14:GND IN	BK	X4:2	

Heatshrink together with W2

W4			
LiYv	2x	0.25 mm² (24 AWG)	0.1 m
X1:18:LED LASER	GY	R1:1	
X1:20:GND	BK	LED1:C	

X2		
P/N: WM1722-ND	Molex: 0510210400	
PicoBlade		4-pin
1	VCC	1
2	GND	2
3	RX IN	3
4	TX OUT	4

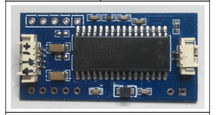


Additional components

4 x Crimp
P/N: WM1142CT-ND, Molex: 0500798000

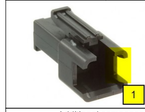
to RFID reader module

RFID Module	iDTRONIC: HF-M890-TTL
1	VCC
2	GND
3	RX
4	TX



For reference only; not part of cable assembly.

X4		
P/N: 455-2926-ND	JST: SMR-02V-B	
SM	male	2-pin
1		1
2		2

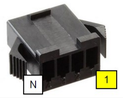


Additional components

2 x Crimp
P/N: 455-1909-1-ND, JST: SYM-001T-P0.6(N)

from 24V/5V Converter via 10009800 cable

X3		
P/N: 455-3248-ND	JST: SMP-04V-BC	
SM	female	4-pin
1	GND	
2	INTERLOCK	
3	ON/OFF	
4	N/C	

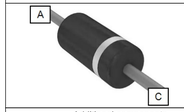


Additional components

3 x Crimp
P/N: 455-1121-1-ND, JST: SHF-001T-0.8BS

to QCL Driver Adaptor PCB via 10010000 cable

D1	
P/N: 497-12047-1-ND	STMicroelectronics: P6KE30A
Diode	TVS
C	
A	



Additional components

0.02 m x Heatshrink D3 (3:1)
Qualtek: Q2-F3X-1/8-01

0.03 m x Heatshrink D6 (3:1)
Qualtek: Q2-F3X-1/4-01

Solder to cable, near X4.

R1		
Resistor	THT, 1k, ±1%, 1/4W	
1		1
2		2

LED1	
P/N: 1516-QBL8IW15C-CW-ND	QT Brightek: QBL8IW15C-CW
LED	5mm, white, clear
A	
C	

Additional components

0.01 m x Heatshrink D1.5 (3:1)
Qualtek: Q2-F3X-1/16-01

0.02 m x Heatshrink D3 (3:1)
Qualtek: Q2-F3X-1/8-01

Laser warning LED

Id	Item	Qty	Unit	Designators	P/N	Manufacturer	MPN
25	Wire, LiYv, 0.5 mm², RD	0.17	m	W3			
24	Wire, LiYv, 0.5 mm², BK	0.17	m	W3			
23	Wire, LiYv, 0.25 mm², YE	0.17	m	W2			
22	Wire, LiYv, 0.25 mm², VT	0.17	m	W2			
21	Wire, LiYv, 0.25 mm², GY	0.1	m	W4			
20	Wire, LiYv, 0.25 mm², BN	0.17	m	W2			
19	Wire, LiYv, 0.25 mm², BK	0.1	m	W4			
18	Wire, LiYv, 0.14 mm², WH	0.25	m	W1			
17	Wire, LiYv, 0.14 mm², RD	0.25	m	W1			
16	Wire, LiYv, 0.14 mm², GN	0.25	m	W1			
15	Wire, LiYv, 0.14 mm², BK	0.25	m	W1			
14	Heatshrink D6 (3:1)	0.17	m	D1, W2		Qualtek	Q2-F3X-1/4-01
13	Heatshrink D3 (3:1)	0.24	m	D1, LED1, W1		Qualtek	Q2-F3X-1/8-01
12	Heatshrink D1.5 (3:1)	0.01	m	LED1		Qualtek	Q2-F3X-1/16-01
11	Crimp	2		X4	455-1909-1-ND	JST	SYM-001T-P0.6(N)
10	Crimp	3		X3	455-1121-1-ND	JST	SHF-001T-0.8BS
9	Crimp	4		X2	WM1142CT-ND	Molex	0500798000
8	Crimp	11		X1	609-3614-1-ND	Amphenol	47649-000LF
7	Connector, SM, male, 2 pins	1		X4	455-2926-ND	JST	SMR-02V-B
6	Connector, SM, female, 4 pins	1		X3	455-3248-ND	JST	SMP-04V-BC
5	Connector, Resistor, THT, 1k, ±1%, 1/4W	1		R1			
4	Connector, PicoBlade, 4 pins	1		X2	WM1722-ND	Molex	0510210400
3	Connector, Mini-PV, female, 20 pins	1		X1	609-2369-ND	Amphenol	65043-027LF
2	Connector, LED, 5mm, white, clear	1		LED1	1516-QBL8IW15C-CW-ND	QT Brightek	QBL8IW15C-CW
1	Connector, Diode, TVS	1		D1	497-12047-1-ND	STMicroelectronics	P6KE30A

Rev	Changelog	Date	Name
01	DCN-2021-06-28-09	2021-06-28	DARO

	Date	Name
Designed	2021-03-29	DARO
Approved	2021-07-21	YIMA

Cable, Computing Unit GPIO

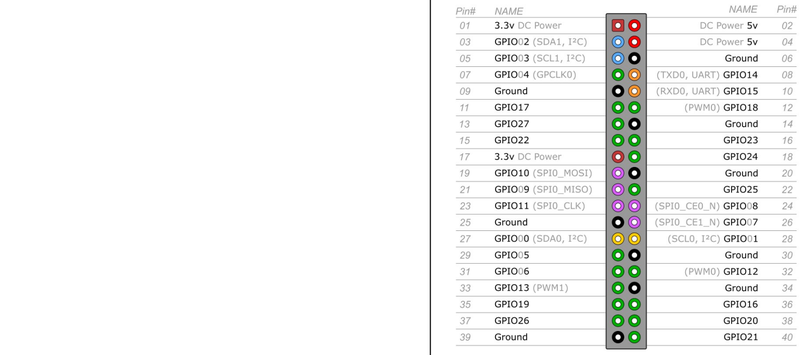
10010101

Sheet 1 of 1

Complex example

Pin header	male	40-pin
3.3V		1
5V		2
GPIO 2		3
5V		4
GPIO 3		5
GND		6
GPIO 4		7
TXD0		8
GND		9
RXD0		10
GPIO 17		11
GPIO 18		12
GPIO 27		13
GND		14
GPIO 22		15
GPIO 23		16
3.3V		17
GPIO 24		18
GPIO 10		19
GND		20

Raspberry Pi 4 B J8 GPIO Header



Raspberry Pi 4 B J14 PoE Header

Pinout Grouping Legend

Rev. 2
19/06/2019 CGS

www.element14.com/RaspberryPi

Raspberry Pi 4 GPIO header

For reference only; not part of cable assembly.

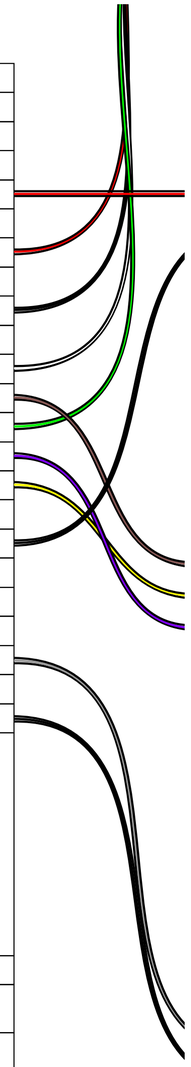
X1		
P/N: 609-2369-ND	Amphenol: 65043-027LF	
Mini-PV	female	20-pin
1	3.3V	1
2	5V IN	2
3	N/C	3
4	RFID 5V	4
5	N/C	5
6	RFID GND	6
7	N/C	7
8	RFID TXD0	8
9	QCL GND	9
10	RFID RXD0	10
11	QCL ON/OFF	11
12	QCL INTERLOCK	12
13	N/C	13
14	GND IN	14
15	N/C	15
16	N/C	16
17	N/C	17
18	LED LASER	18
19	N/C	19
20	GND	20

Additional components

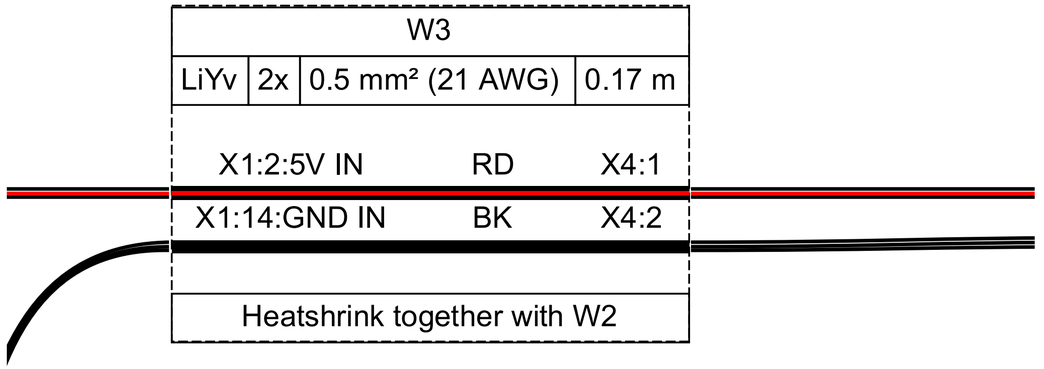
11 x Crimp
P/N: 609-3614-1-ND, Amphenol: 47649-000LF

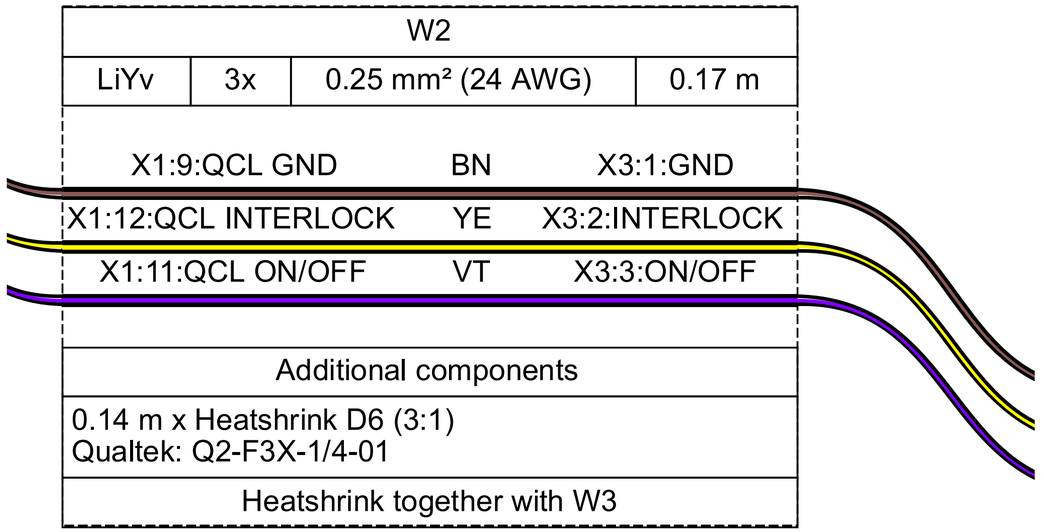
to Raspberry Pi GPIO header

attach to pins 1 through 20



Complex example





Complex example

LED1	
P/N: 1516-QBL8IW15C-CW-ND	QT Brightek: QBL8IW15C-CW
LED	5mm, white, clear
A	
C	

Additional components
0.01 m x Heatshrink D1.5 (3:1) Qualtek: Q2-F3X-1/16-01
0.02 m x Heatshrink D3 (3:1) Qualtek: Q2-F3X-1/8-01
Laser warning LED

					Date	Name
				Designed	2021-03-29	DARO
				Approved	2021-07-21	YIMA
01	DCN-2021-06-28-09	2021-06-28	DARO			
Rev	Changelog	Date	Name			

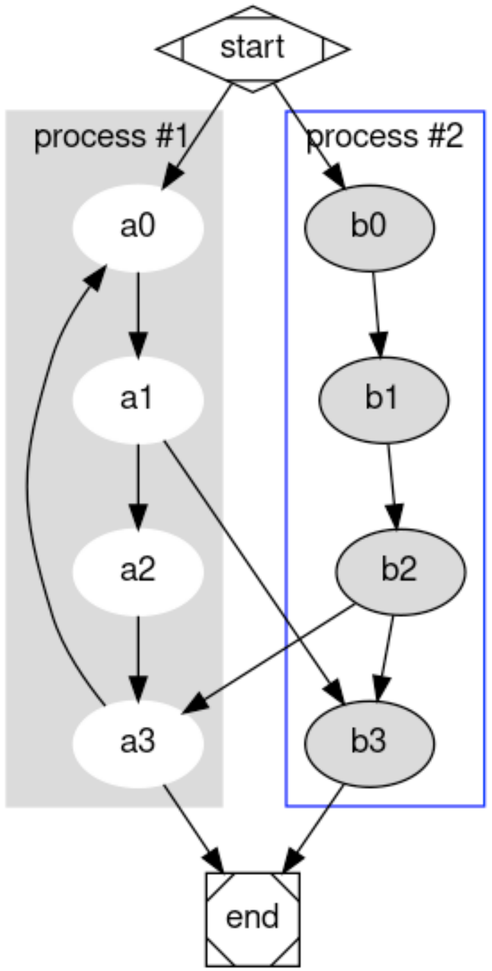
Cable, Computing Unit GPIO	
10010101	Sheet 1
	of 1

Complex example

Id	Item	Qty	Unit	Designators	P/N	Manufacturer	MPN
25	Wire, LiYv, 0.5 mm², RD	0.17	m	W3			
24	Wire, LiYv, 0.5 mm², BK	0.17	m	W3			
23	Wire, LiYv, 0.25 mm², YE	0.17	m	W2			
22	Wire, LiYv, 0.25 mm², VT	0.17	m	W2			
21	Wire, LiYv, 0.25 mm², GY	0.1	m	W4			
20	Wire, LiYv, 0.25 mm², BN	0.17	m	W2			
19	Wire, LiYv, 0.25 mm², BK	0.1	m	W4			
18	Wire, LiYv, 0.14 mm², WH	0.25	m	W1			
17	Wire, LiYv, 0.14 mm², RD	0.25	m	W1			
16	Wire, LiYv, 0.14 mm², GN	0.25	m	W1			
15	Wire, LiYv, 0.14 mm², BK	0.25	m	W1			
14	Heatshrink D6 (3:1)	0.17	m	D1, W2		Qualtek	Q2-F3X-1/4-01
13	Heatshrink D3 (3:1)	0.24	m	D1, LED1, W1		Qualtek	Q2-F3X-1/8-01
12	Heatshrink D1.5 (3:1)	0.01	m	LED1		Qualtek	Q2-F3X-1/16-01
11	Crimp	2		X4	455-1909-1-ND	JST	SYM-001T-P0.6(N)
10	Crimp	3		X3	455-1121-1-ND	JST	SHF-001T-0.8BS
9	Crimp	4		X2	WM1142CT-ND	Molex	0500798000
8	Crimp	11		X1	609-3614-1-ND	Amphenol	47649-000LF
7	Connector, SM, male, 2 pins	1		X4	455-2926-ND	JST	SMR-02V-B
6	Connector, SM, female, 4 pins	1		X3	455-3248-ND	JST	SMP-04V-BC
5	Connector, Resistor, THT, 1k, ±1%, 1/4W	1		R1			
4	Connector, PicoBlade, 4 pins	1		X2	WM1722-ND	Molex	0510210400
3	Connector, Mini-PV, female, 20 pins	1		X1	609-2369-ND	Amphenol	65043-027LF
2	Connector, LED, 5mm, white, clear	1		LED1	1516-QBL8IW15C-CW-ND	QT Brightek	QBL8IW15C-CW
1	Connector, Diode, TVS	1		D1	497-12047-1-ND	STMicroelectronics	P6KE30A

Under the hood: GraphViz

Under the hood: GraphViz



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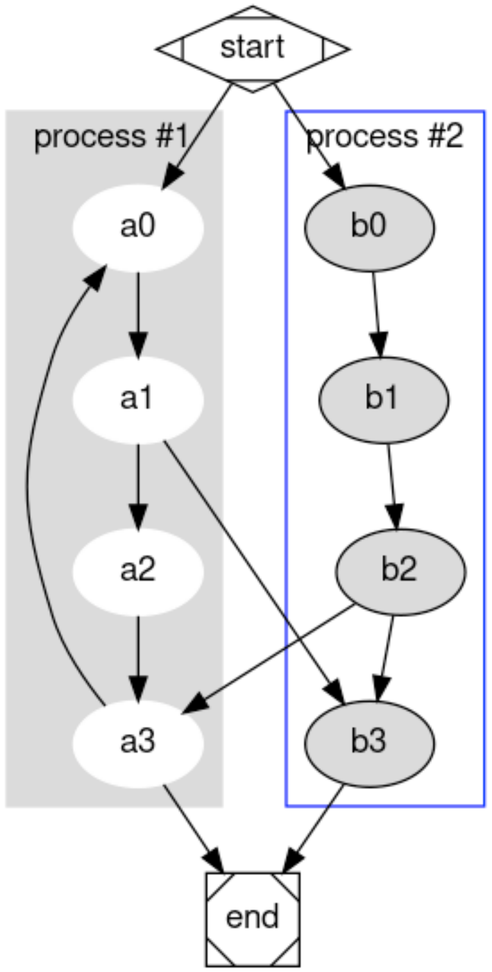


```
digraph G {

  subgraph cluster_0 {
    style=filled;
    color=lightgrey;
    node [style=filled,color=white];
    a0 → a1 → a2 → a3;
    label = "process #1";
  }

  subgraph cluster_1 {
    node [style=filled];
    b0 → b1 → b2 → b3;
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  }
  start → a0;
  start → b0;
  a1 → b3;
  b2 → a3;
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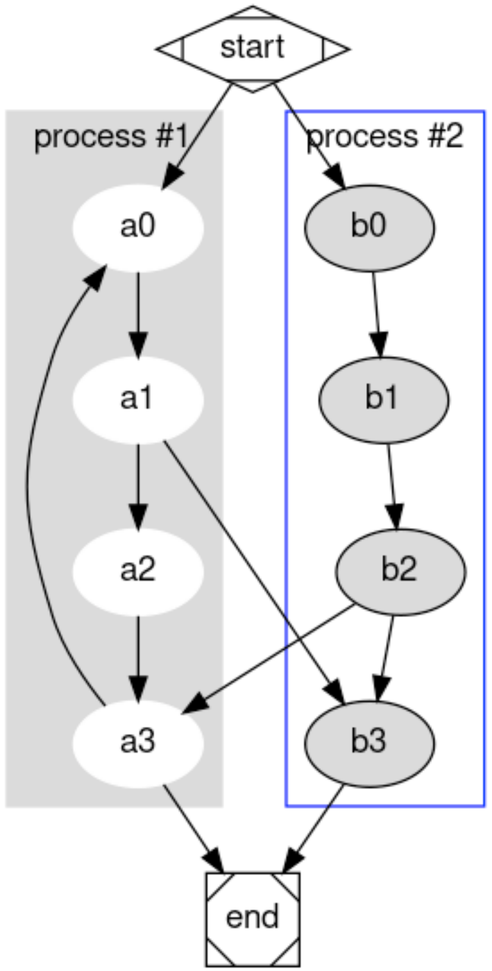
  b3 → end;

  start [shape=Mdiamond];
  end [shape=Msquare];
}
```

Under the hood: GraphViz



- Describes a graph

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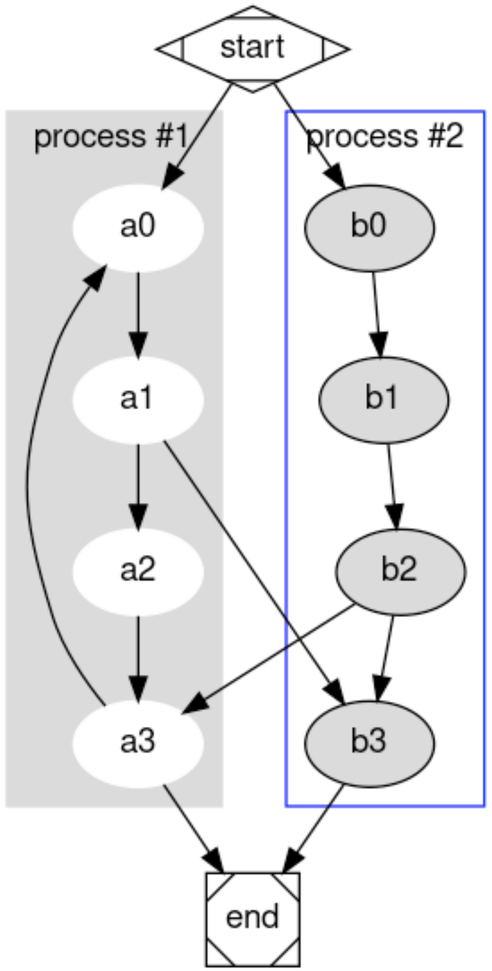
Under the hood: GraphViz



- Describes a graph
- Simple language

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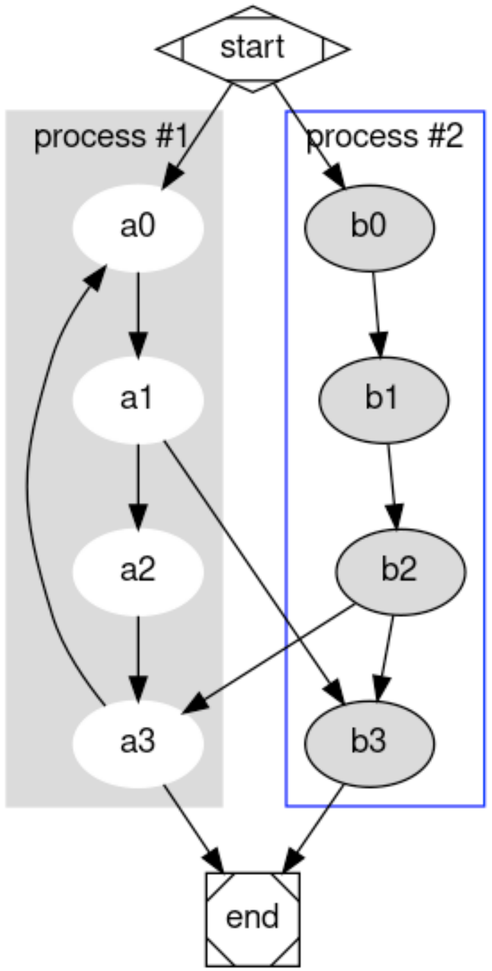
Under the hood: GraphViz



- Describes a graph
- Simple language
- Takes care of layout

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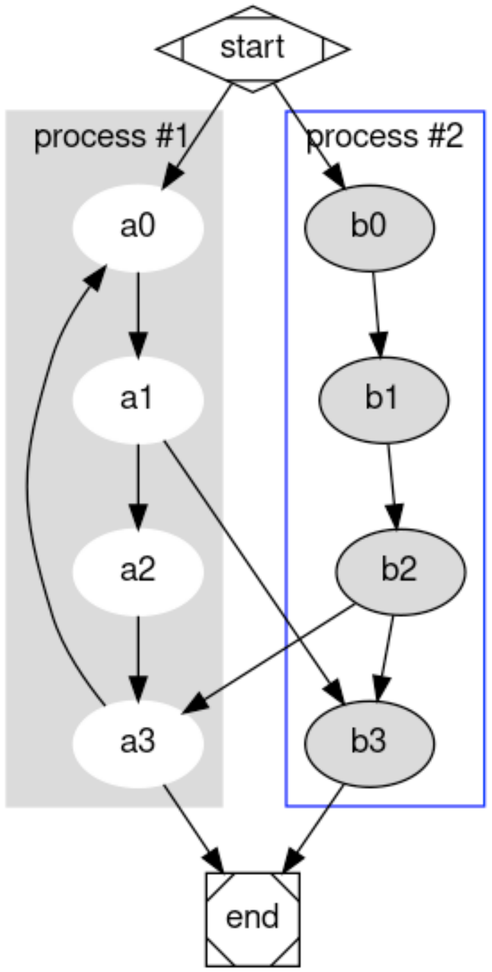

- Describes a graph
- Simple language
- Takes care of layout
- Output is

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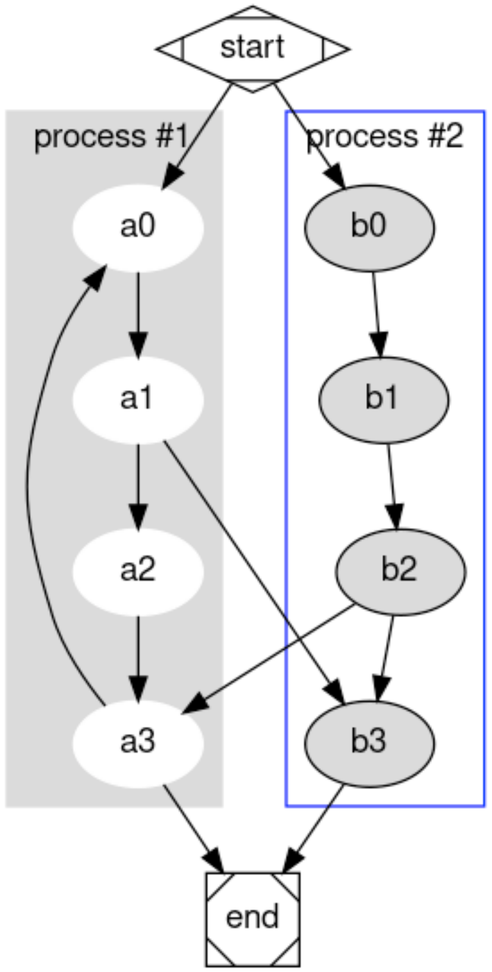

- Describes a graph
- Simple language
- Takes care of layout
- Output is
  - clean

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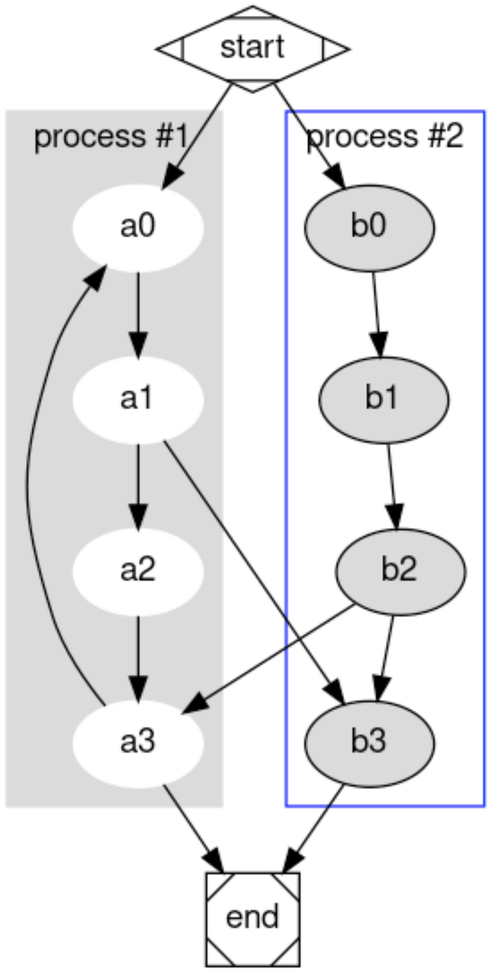

- Describes a graph
- Simple language
- Takes care of layout
- Output is
  - clean
  - boring (at first)

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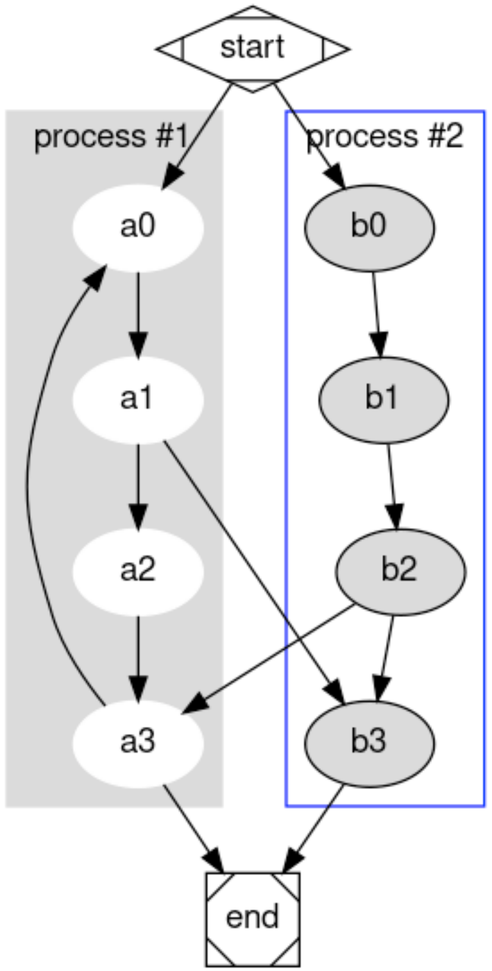

- Describes a graph
- Simple language
- Takes care of layout
- Output is
  - clean
  - boring (at first)
  - a bit unpredictable

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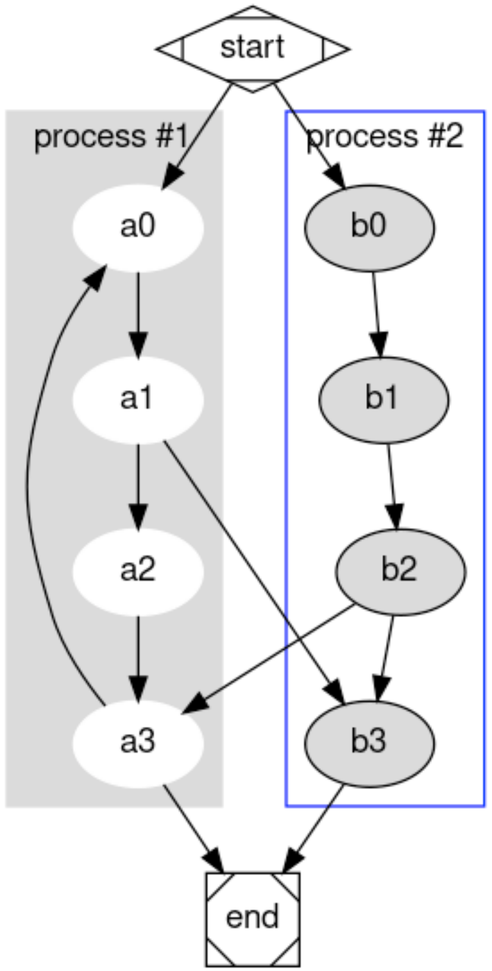
Under the hood: GraphViz



- Describes a graph
- Simple language
- Takes care of layout
- Output is
  - clean
  - boring (at first)
  - a bit unpredictable
  - customizable!

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digraph G {

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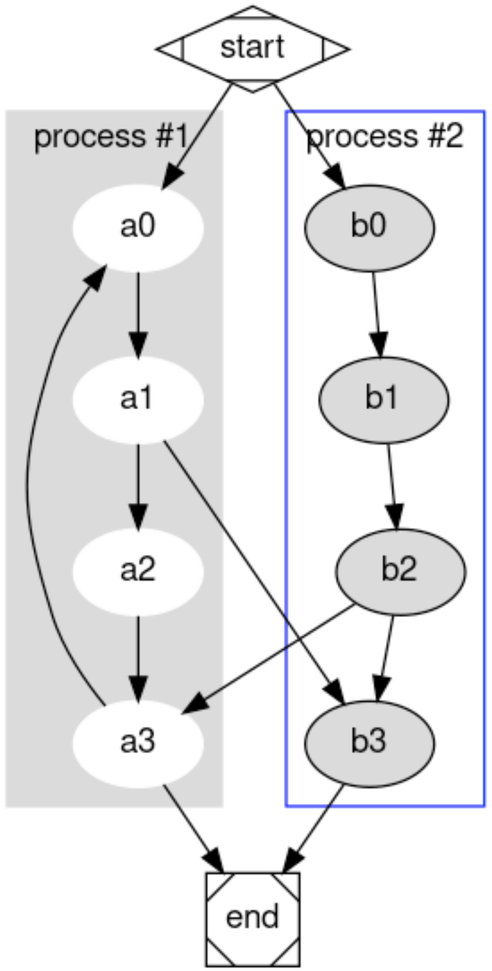

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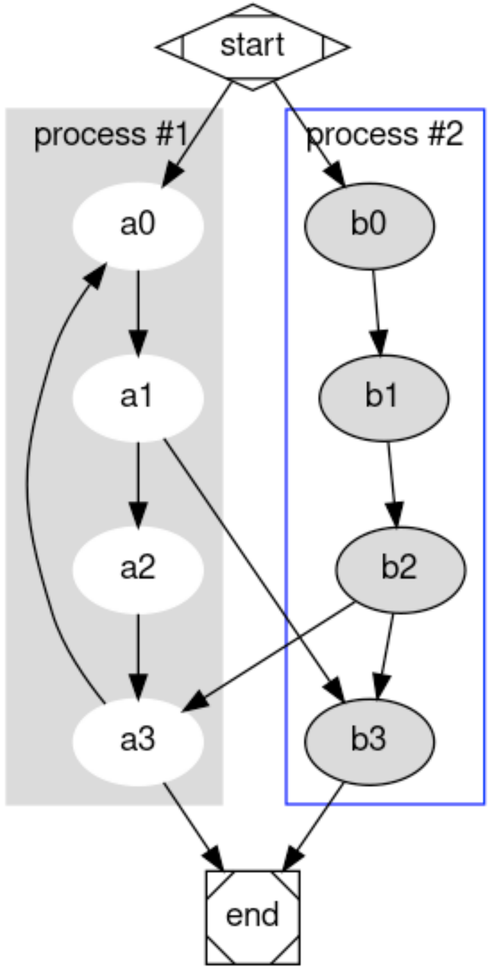

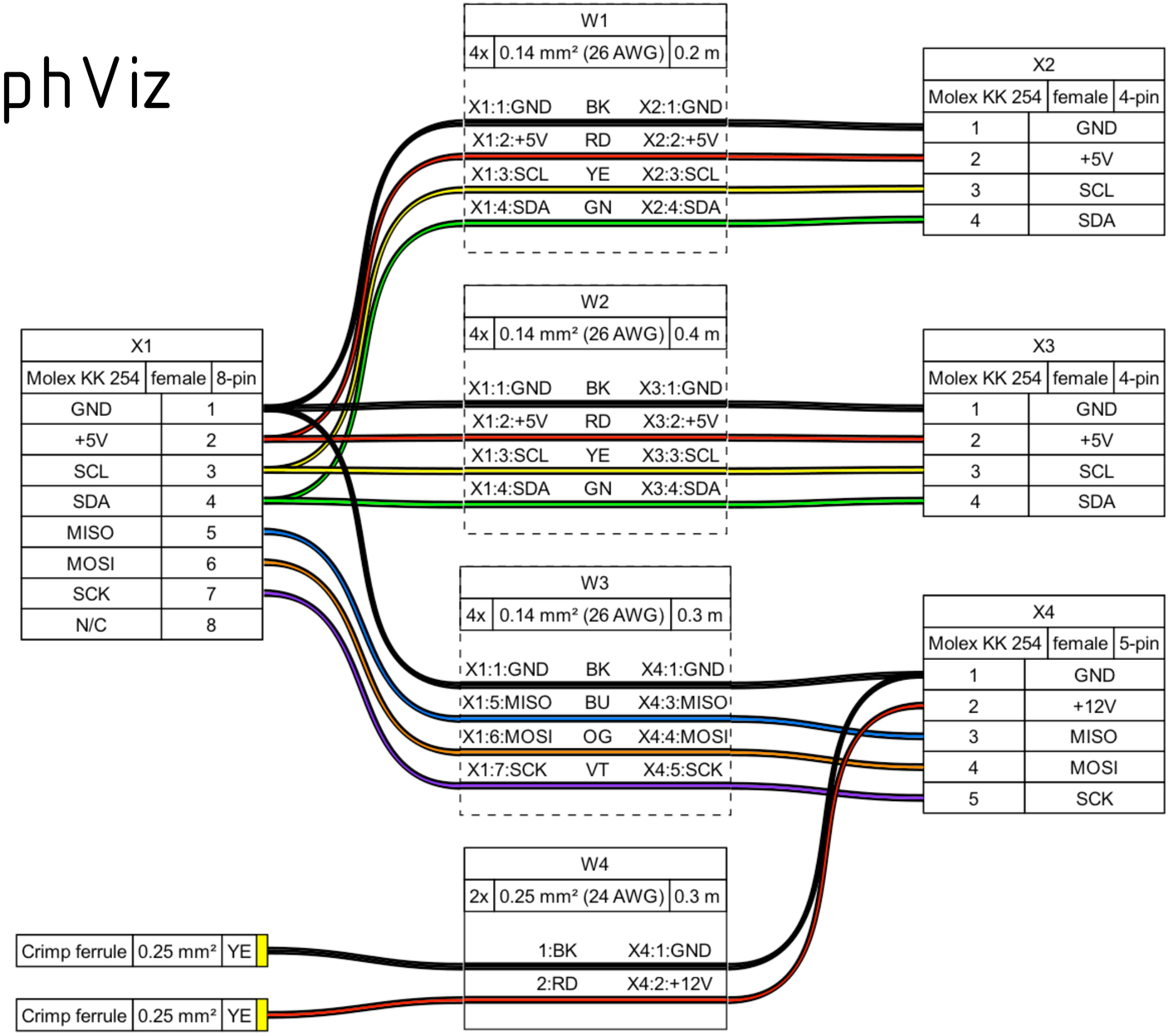

Under the hood: GraphViz

```
graph {
        graph [bgcolor="#FFFFFF" fontname=arial nodesep=0.33 rankdir=LR ranksep=2]
        node [fillcolor="#FFFFFF" fontname=arial height=0 margin=0 shape=none style=filled width=0]
        edge [fontname=arial style=bold]
```

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        X1 [label=<
<table border="0" cellspacing="0" cellpadding="0">
 <tr><td>
  <table border="0" cellspacing="0" cellpadding="3" cellborder="1"><tr>
   <td balign="left">X1</td>
  </tr></table>
 </td></tr>
 <tr><td>
  <table border="0" cellspacing="0" cellpadding="3" cellborder="1"><tr>
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  <table border="0" cellspacing="0" cellpadding="3" cellborder="1">
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    <td>DCD</td>
    <td port="p1r">1</td>
   </tr>
   <tr>
    <td>RX</td>
    <td port="p2r">2</td>
   </tr>
   <tr>
    <td>TX</td>
    <td port="p3r">3</td>
   </tr>
   <!-- repeat ad nauseam -->
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```

```
edge
[color="#000000:#FFFFFF:#000000"]
X1        -- W1
W1        -- X2
```

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```

```
edge
[color="#000000:#FFFFFF:#000000"]
X1:p5r    -- W1:w1
W1:w1     -- X2:p1l
```

Under the hood: GraphViz

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graph {
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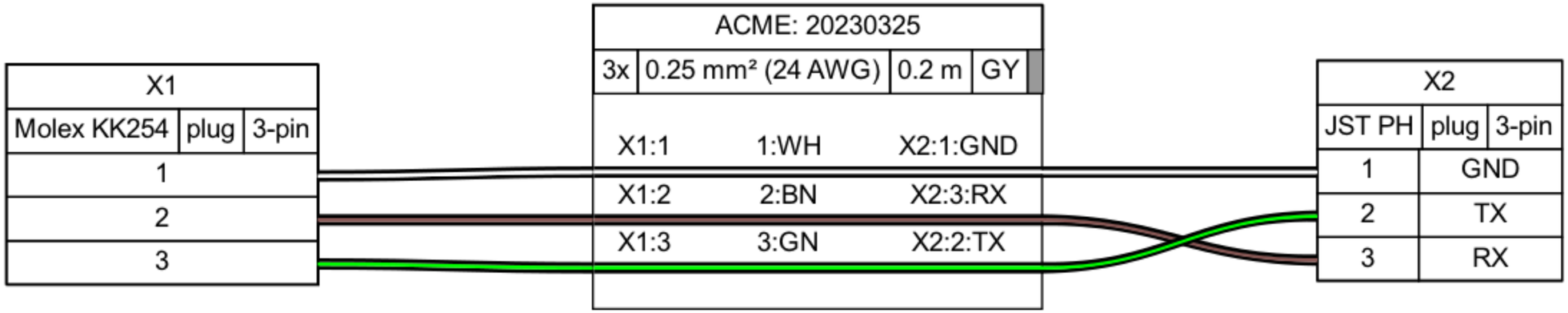
```

```
edge
[color="#000000:#FFFFFF:#000000"]
X1:p5r:e -- W1:w1:w
W1:w1:e -- X2:p1l:w
```

Thanks!



github.com / WireViz / WireViz

danielrojas.net

@formatc1702 > GitHub | Hackaday.io | Mastodon (@chaos.social)