WIZcube HMI Main Module
Raspberry Pico + WIZnet Ethernet HAT

COMMUNICATION COICES
1 – ETHERNET WIZNET PICO MODULE
2 – CANBUS
3 – RS485
4 – I2C

M10RASPI

1

PICO

2

CANBUS

3

File: canbus.kicad_sch

RS485

4

File: rs485.kicad_sch

According to OSHA https://www.oshwa.org/a-resolution-to-redefine-spi-signal-names/

New signal names:

SDO – Serial Data Out. An output signal on a device where data is sent out to another SPI device.
SDI – Serial Data In. An input signal on a device where data is received from another SPI device.
CS – Chip Select. Activated by the controller to initiate communication with a given peripheral.
PICO (peripheral in/controller out). For devices that can be either a controller or a peripheral; the signal on which the device sends output when acting as the controller, and receives input when acting as the peripheral.
POCI (peripheral out/controller in). For devices that can be either a controller or a peripheral; the signal on which the device receives input when acting as the controller, and sends output when acting as the peripheral.
SDIO – Serial Data In/Out. A bi-directional serial signal.

Deprecated signal names:

MOSI – Master Out Slave In
MISO – Master In Slave Out
SS – Slave Select
MOMI – Master Out Master In
SOSI – Slave Out Slave In

Signal names unchanged:

SCK – Serial Clock. The clock for the bus generated by the controller.

Raspberry Pico + WIZnet Ethernet HAT

HMI Main Module
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M10CUBE

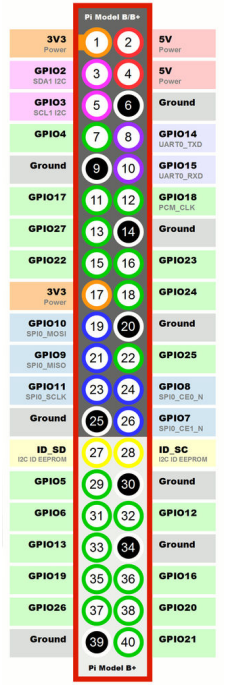
OSHW
GR000004

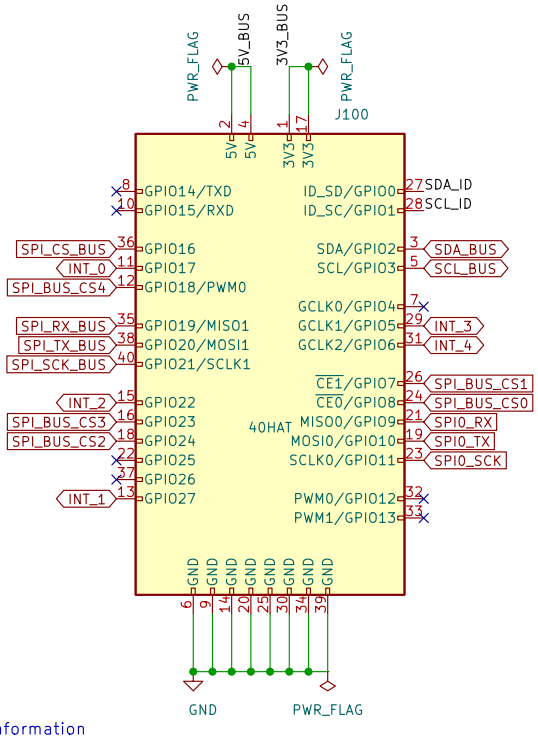
Sheet: /
File: M10HM01-20.kicad_sch

Title: WIZcube M10HM01

Size: A4	Date: 2022-02-18	**Rev: 20.1.1**
KiCad E.D.A. kicad 6.0.2-378541a8eb~116~ubuntu21.10.1		Id: 1/5

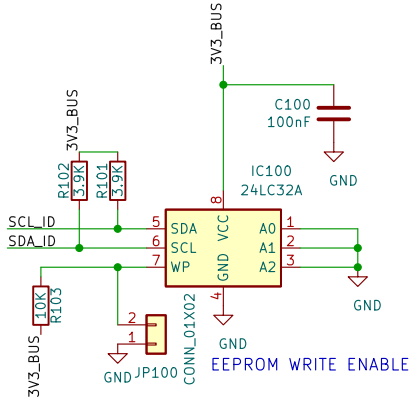
RASPBERRI PI HAT STAGE





HAT EEPROM

The HAT spec requires this EEPROM with system information to be in place in order to be called a HAT. It should be set up as write protected (WP pin held high), so it may be desirable to either put a jumper as shown to enable writing, or to hook up a spare IO pin to do so.



LOG1
OSHWGR

H1
H2
H3
H4

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Sheet: /M10RASPI/
File: m10raspi.kicad_sch

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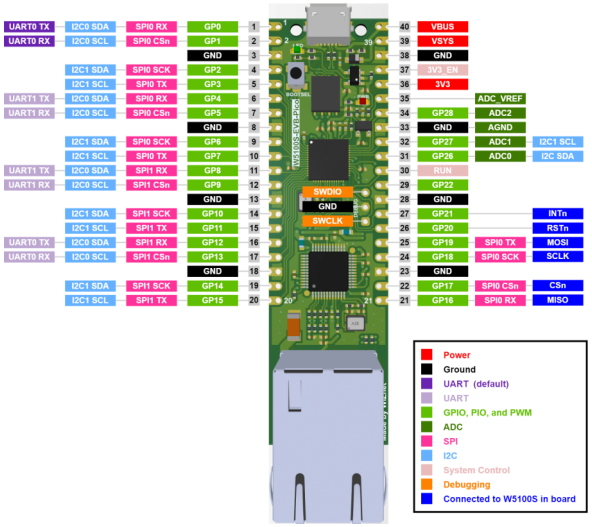
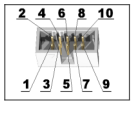
KiCad E.D.A. kicad 6.0.2-378541a8eb-116-ubuntu21.10.1		Id: 1/5

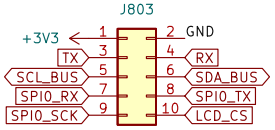
RASPBERRY PICO STAGE



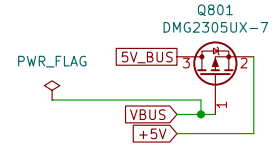
UEXT
I2C SPI UART

Pin #	Signal Name
1	3.3V
2	GND
3	TXD
4	RXD
5	SCL
6	SDA
7	MISO
8	MOSI
9	SCK
10	SSEL

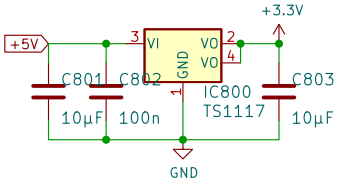




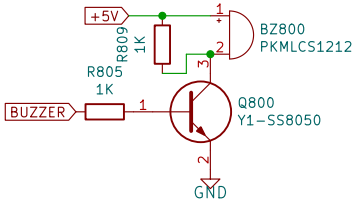
PMOSFET to allow powering PICO from external +5V while still connected via USB. Per Raspberry PI Pico datasheet.

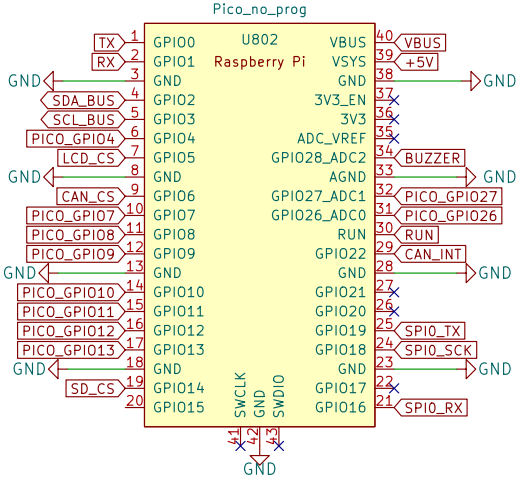


PSU

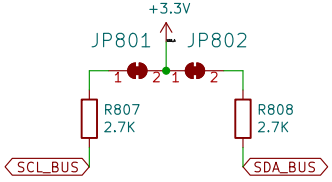


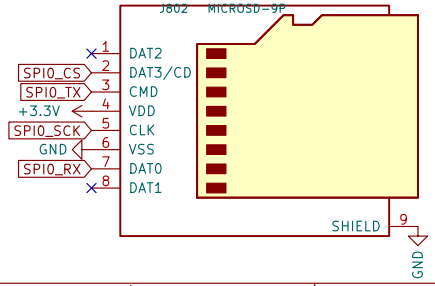
BUZZER



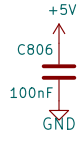


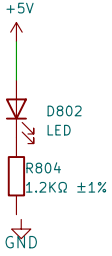
JP2 = I2C Pullups Closed by Default

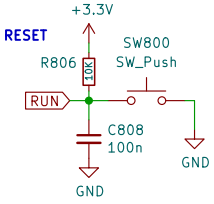




DISPICKING CLOSE TO CPU POWER







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M10CUBE

OSHW GR000004

Sheet: /PICO/

File: pico.kicad_sch

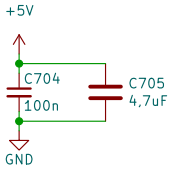
Title: WIZcube M10HM01

Size: A4	Date: 2022-02-18	**Rev: 20.1.1**
KiCad E.D.A.	kicad 6.0.2-378541a8eb~116~ubuntu21.10.1	Id: 2/5

HIGH SPEED CAN FD
Flexible Data Rate up to 5 Mbps

DISPICKING
CLOSE TO
MCP2517FD POWER

DISPICKING
CLOSE TO
MCP2562FD POWER



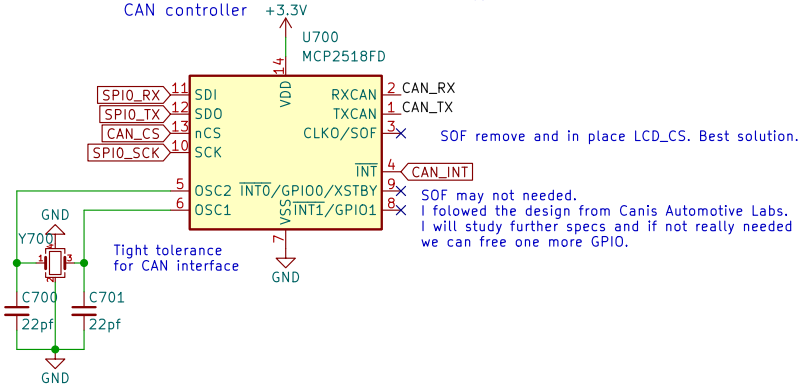
Test point connector removed. Not needed.

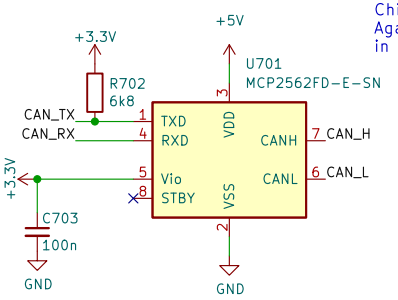
Yes you have right.
KiCad has no library for 2518 so that was a fast decition.
I will make one copy with name 2518 later tomorow

Again R802 was on Canis.
I will have a look on specs too.
May be becouse he needed to make
experiments without the 2518 chip

CAN transceiver
Chip MCP2562FD contains Protection
Against High-Voltage Transients
in Automotive Environments

CAN controller

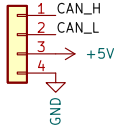




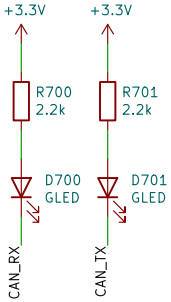
A simplified version is placed wit this JST-PH 2mm connector.
In any case if we need to inject +24V power it can be done
in combination with PWR2 connector
Theese two compined will bring all signals to an external RJ45 or M12 connector
acording to Libresollar (RJ45) or CANOPEN (M12) standard.
Have in mind that two connectors may axis to daizy chain.
But in most cases the T aproach is used. That way the communication
will not brake when a node is removed.
We can do both by havig the obove aproach and we see.
There is always a revision in future time

OPTOPNAL CANBUS TERMINATION

J700



CAN indicator LEDs



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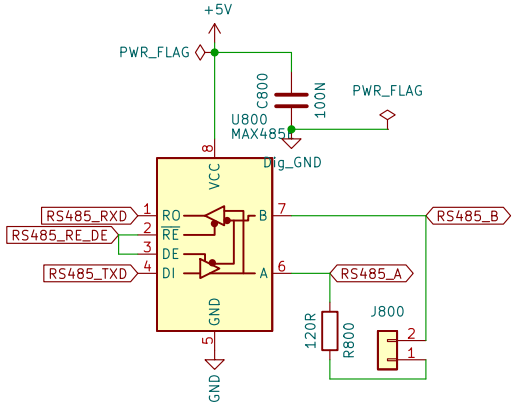
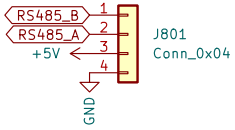
RS485

FOR BETTER IMUNITY INFINEON
ISL3159E CAN BE USED INSTED OF MAX485
WITH ±15kV IEC61000 ESD on RS-485
up to 40Mbps required by high speed PROFIBUS applications

For remote control communication with other industrial euipment (eg VFD)
isolation may needed. Use VOM452 chip (as in spindle controller)
or better PS9821-2 (smart metering)



RS485 + POWER TO REMOTE PICO CNC



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KiCad E.D.A. kicad 6.0.2-378541a8eb~116~ubuntu21.10.1		Id: 8/5