

# Toyota Prius Gen2 inverter controller

## Intro

The Prius inverter kit serves as a controller to the popular Prius Gen2 inverter/converter. It is meant to run the stronger MG2 inverter to run a motor and run the buck/boost stage in combination with the MG1 diode bridge as a 1-3 phase battery charger.

You may also choose to parallel MG1 and MG2 inverter by routing the PWM outputs to both inverters and also enabling both inverters with their respective control signals.

Provided is a waterproof automotive grade enclosure that lets you place this controller anywhere in your car. Also provided is the 32-pin connector that plugs into the Prius inverter and the 2 Molex connectors that plug into the enclosures integrated sockets.

The controller runs the well known openinverter software including resolver excitation. Depending on your motor type (asynchronous or synchronous) the software comes in “sine” and “FOC” flavour.

## Part List

#	Name	M/F Part #
1	Control Board	
2	Wifi module	Olimex MOD-WIFI-ESP8266
3	10-pole 90° pin header	61201021721
4	Cinch 12+20 header	5810132011
5	Cinch enclosure	5810130065
6	Molex 20-pin connector	0334722002
7	Molex 12-pin connector	0334721201
8	Molex pins (32)	0330122002
9	TE 32-pin connector	1318747-1
10	TE connector pins (20)	1123343-1

## Wifi Access

SSID: inverter

Password: inverter123

Link: <http://192.168.4.1>



## Pin Mapping

The smaller 12-pin socket is the interface to the inverter, the larger 20-pin socket is the interface to your car.

### Car Interface

### Inverter Interface

```
+-----+ +-----+
|  1  2  3  4  5  6  7  8  9 10 | | 21 22 23 24 25 26 |
| 11 12 13 14 15 16 17 18 19 20 | | 27 28 29 30 31 32 |
+-----+ +-----+
```

Pin	Name	Pin	Name	Pin	Name (# on inv)	Pin	Name (# on inv)
1	ENC_B/S3	9	START_IN	17	CANL	25	VH (12)
2	S1S4	10	BRAKE_IN	18	CANH	26	MIVT (26)
3	ENC_A/S2	11	FORWARD_IN	19	GND	27	MFIV (27)
4	R1	12	REVERSE_IN	20	12V	28	MUU (9)
5	R2	13	MTEMP-	21	GIVA (2)	29	MVU (10)
6	5V	14	MTEMP+	22	MIVA (7)	30	MWU (11)
7	THROTTLE1	15	DCSW_OUT	23	GIWA (18)	31	CPWM (13)
8	THROTTLE2	16	PREC_OUT	24	MIWA (23)	32	GINV/GCNV (16/32)

Connect MSDN pin #25 in inverter (not 25 of this controller) permanently to 12V to enable the MG2 inverter. Connect CPWM to 12V via a 470 Ohm resistor for charge mode.

Connect the 2-pole power connector to 12V and GND to power the inverter electronics.

## Parameters and Software

The board comes pre-programmed with the FOC software and appropriate inverter parameters for the Prius Gen2 inverter. All other parameters must be customized to your application.

When running an asynchronous motor you need to flash the stm32\_sine.bin binary using the web interface.

You can download the latest version here: <https://github.com/jsphuebner/stm32-sine/releases>