



Raspberry Pi Charging HAT

- DB2605 Kit

Setup Guide

1.0.0

Thank you for purchasing our product.
Please read this user manual carefully before use and keep it properly for future reference.

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Revision History

Revision	Date	Revised by	Descriptions
1.0.0	2024.4.24	SQ.Lai	Init.

1 OVERVIEW

The Raspberry Pi Charging HAT - DB2605 kit is a platform that allows evaluation, software development and integration of DB2605, the ISO 15118-2/20 AC charging solution.

For evaluation purposes, kit is configured to communicate over the UART interface between the DB2605 and Raspberry Pi. The kit is configured to communicate over pilot wire and the user can establish a charging session by connecting EV (Electric Vehicle) over pilot wire or by connecting to EVCC (Electric Vehicle Communication Controller) that are compliant to HPGP and ISO 15118.

The Kit also provides the product designer with several additional options to facilitate the development of the intended new product. It can be powered from either a USB Type-C power supply or Raspberry PI interface power supply. In addition, the board has several configuration jumpers, push buttons and LEDs to further customize DB2605 per the new system requirements.

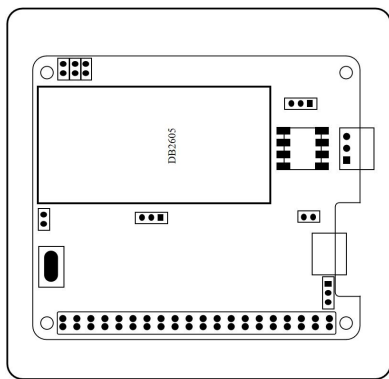
In summary, a wide range of applications are supported by the versatile and flexible configuration of the DB2605 based Raspberry Pi HAT.

2 ORDER INFORMATION

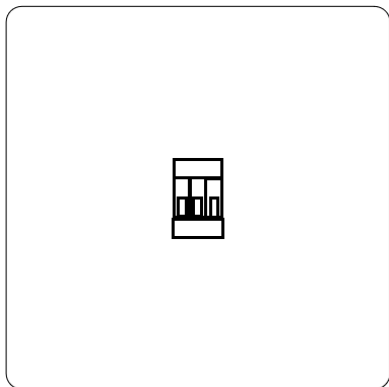
- Rasp-HAT-DB2605: Raspberry Pi Charging HAT - DB2605 Kit.

2.1 Packing List

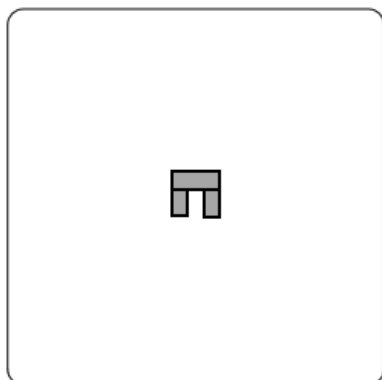
The following list diagram is for reference only. Please refer to the actual product inside the package for details.



1x
Raspberry Pi Charging HAT - DB2605 Kit



1x
Charging Connector (PP/PE/CP)



8x
Jumpers



3 **SUPPORT MATERIAL**

- Hardware Schematics
 - Raspberry Pi Charging HAT - DB2605 Kit PCB

- Software
 - DB2605 Firmware

- Documentation
 - Raspberry Pi Charging HAT - DB2605 Kit Setup Guide (This Document)
 - Raspberry Pi Charging HAT - DB2605 Kit Quick Start Guide
 - DB2605 Programming Guide
 - DB2605 Product Specification

4 RASPBERRY PI CHARGING HAT FEATURES

- ◆ DB2605, adding the core ISO 15118-2/20 functionalities to AC chargers.
- ◆ Raspberry Pi 4B/5 HAT
- ◆ Raspberry Pi side C code charger simulator
- ◆ Single PCB design includes constant-power and low-power circuits
- ◆ Software API



5 RASPBERRY PI CHARGING HAT - DB2605 KIT

Figure 5-1 depicts the Raspberry Pi Charging HAT- DB2605 kit and major sections.

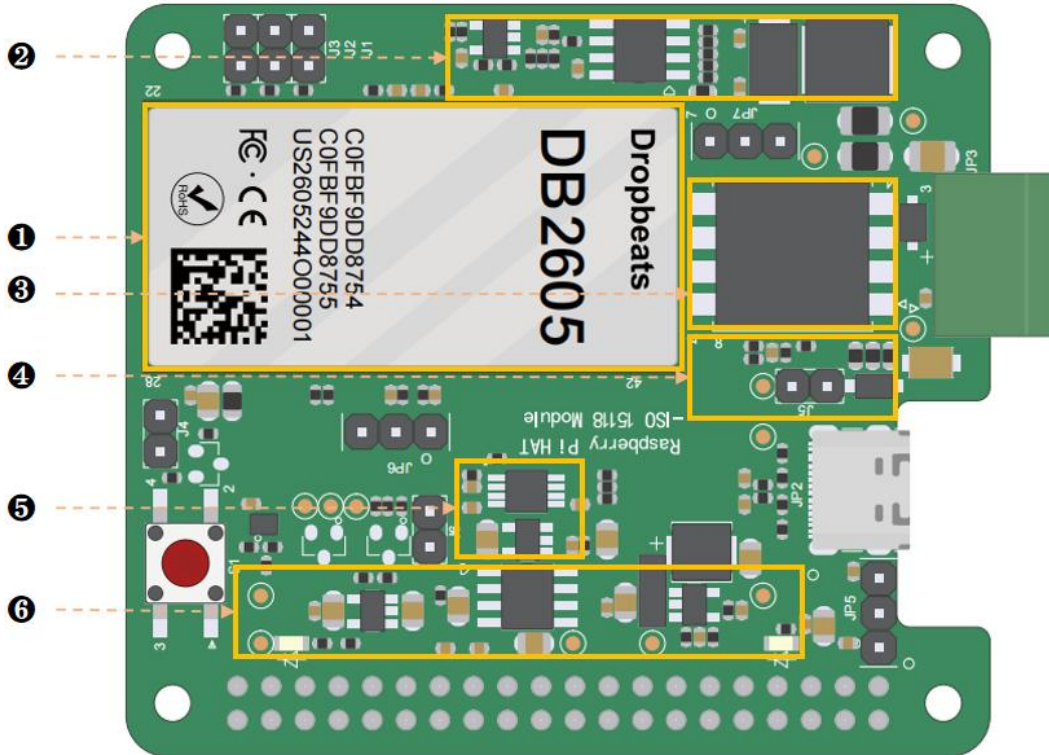


Figure 5-1: Raspberry Pi Charging HAT Main Sections

Table 1: Raspberry Pi Charging HAT Main Sections

Item Number	Description
1	DB2605 Module
2	Control Pilot Generation and Measurement
3	Powerline signal coupling transformer
4	Proximity Pilot Circuit and Measurement
5	Pilot ADC for Raspberry Pi
6	Internal Power, +12V, -12V, 3.3V



Figure 5-2 depicts Raspberry Pi Charging HAT’s connectors, interfaces, jumpers, push buttons and LEDs. See Table 2 for the details.

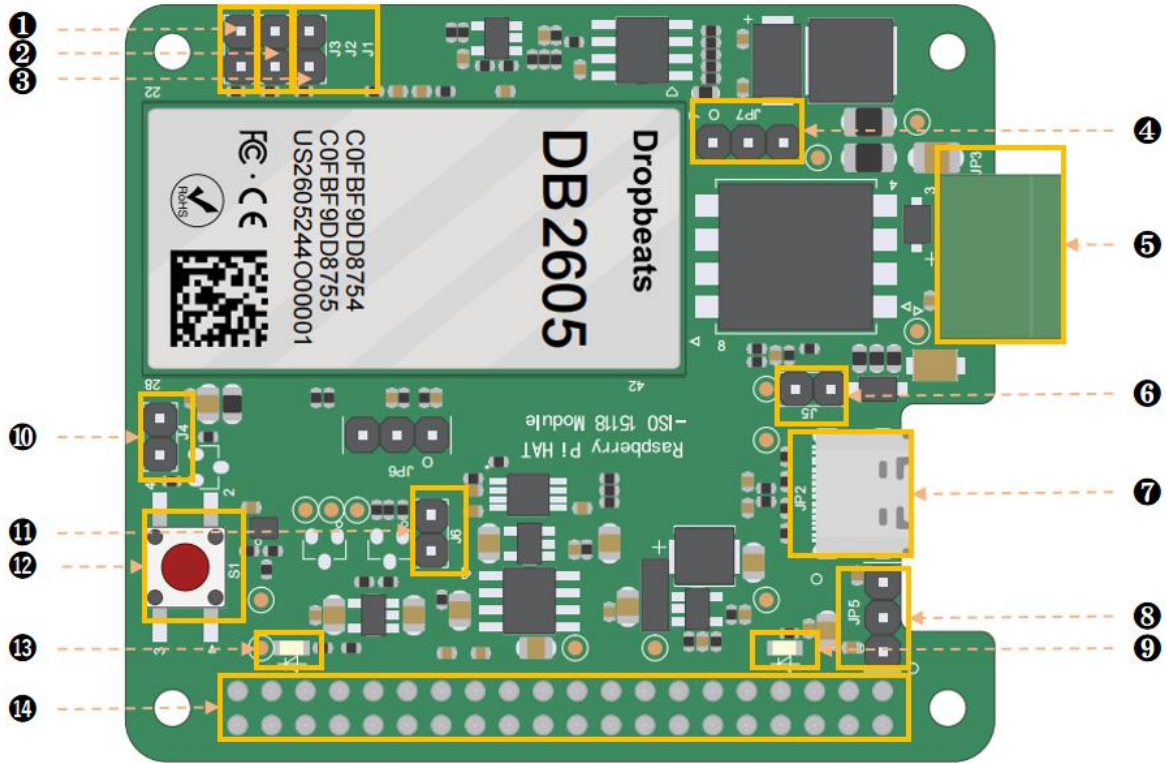


Figure 5-2: Raspberry Pi Charging HAT Connectors, Interfaces and Jumpers

Table 2: Raspberry Pi Charging HAT Connectors, Interfaces and Jumpers

Item Number	Schematics Reference	Description
1	J1	Reserved Jumper
2	J2	DB2605 PWM Signal Enable/Disable Jumper
3	J3	Reserved Jumper
4	JP7	Control Pilot PWM Signal Source Selection Jumper
5	JP3	Connector for Pilot wire (PP/PE/CP)
6	J5	Proximity Pilot Power enable/disable Jumper
7	JP2	USB Type-C connector for power supply
8	JP5	Power Source Selection Jumper
9	D4	5V power LED
10	J4	BOOT Configuration Jumper for DB2605 Firmware upgrading
11	J6	Power Mode Jumper



12	S1	Reset push button
13	D12	3V3 power LED
14	JP1	Raspberry Pi Interface

6 SETTING UP THE DB2605 KIT

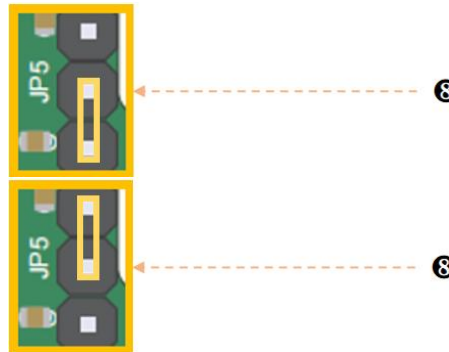
Before booting the DB2605 Kit, check that jumpers are set to the correct positions as explained below.

6.1 Power Source

Figure 5-2, Item 8, JP5 Jumper setting.

Power Sinks from Raspberry Pi HAT Interface

Power Sinks from USB Type-C socket



6.2 Power Mode

There are two power modes: constant-power and low-power modes. As default, the low-power mode is used.

Figure 5-3, Item 11, J6 Jumper setting.

low-power mode (**Recommended**)

Constant-power mode



Low-Power Mode (Recommended)

The J6 Jumper is not installed; the internal 3.3v power is power-off; the DB2605 is power-off. After EV connects, the 3.3V power will be waken up automatically, and then DB2605 will boot.

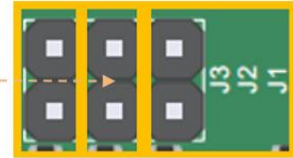


6.3 DB2605 PWM Signal Generation

The Control Pilot PWM (IEC 61851) Signal could be generated from DB2605.
Figure 5-2, Item 2, J2 Jumper setting.

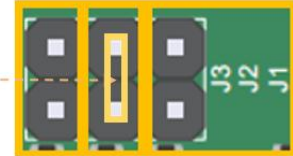
DB2605 PWM Signal Generation Disable

②



DB2605 PWM Signal Generation Enable

②



6.4 Control Pilot PWM Signal Source Selection

The Control Pilot PWM Signal could be selected by from Figure 5-2, Item 4, JP7 Jumper.

Control Pilot PWM Signal Source is DB2605



④

Control Pilot PWM Signal Source is Raspberry Pi



④

6.5 Proximity Pilot Power

Proximity Pilot Power could be enabled or disabled by Figure 5-2, Item 6, J5 Jumper.

Proximity Pilot Power is OFF



⑥

Proximity Pilot Power is ON



⑥

Proximity Pilot Power

In case of Europe charge station with “Charge Mode 3”, the Jumper, JP7, may be installed.
In other case, DO NOT install.

6.6 **BOOT Configuration for DB2605 Firmware Upgrading**

As default, [Figure 5-2, Item 10](#), J4 Jumper is not as installed, and DB2605 boots from FLASH.

DB2605 boots from Flash



DB2605 boots from external UART0
Interface for firmware upgrading

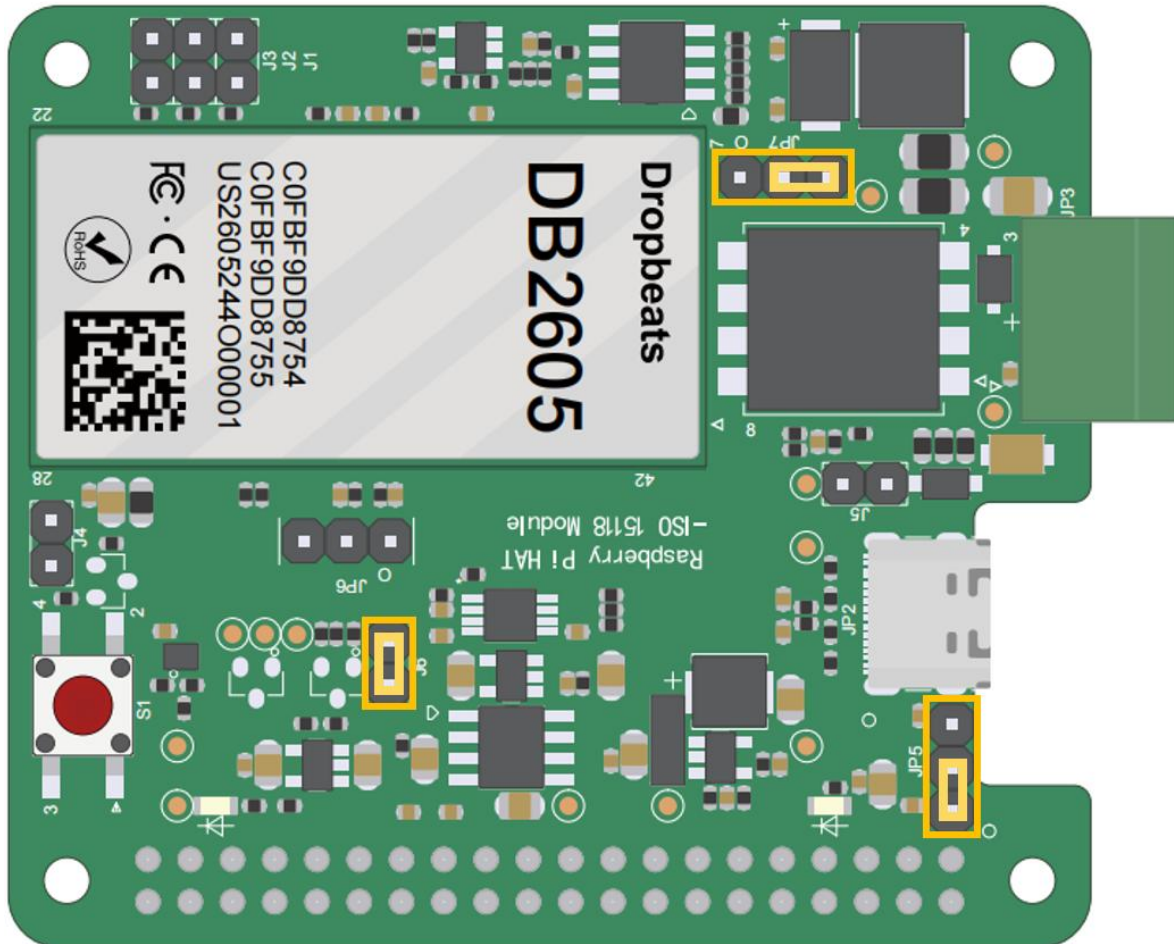


DB2605 Firmware Upgrading

Install J4 Jumper, then push reset button, [Figure 5-3, Item 12, S1](#).

7 CHARGING CONFIGURATION EXAMPLES

7.1 Control Pilot Signal Managed by Raspberry Pi

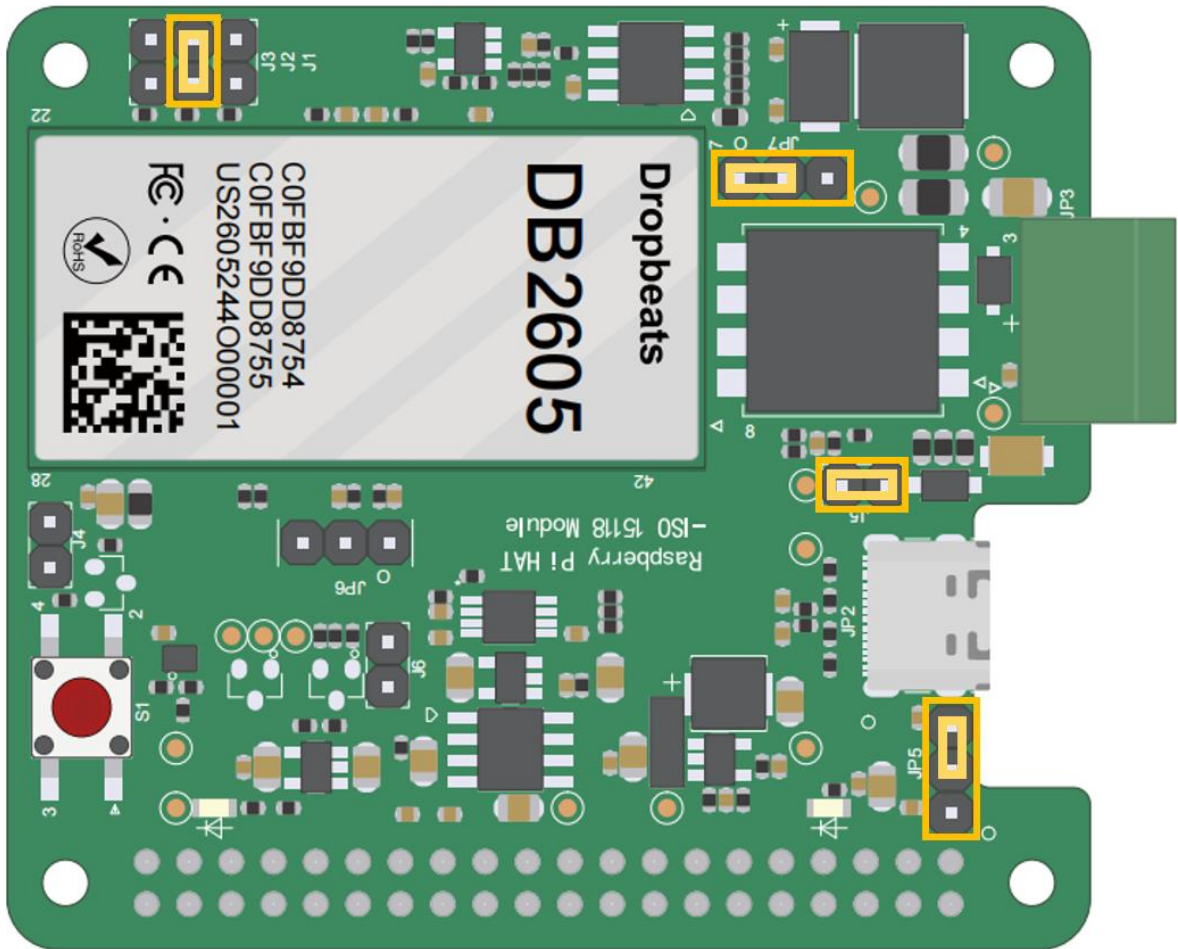


In this example,

- The power is provided by Raspberry Pi HAT interface
- The Control pilot PWM signal is generated and selected by Raspberry Pi.
- Constant-power is used.



7.2 Control Pilot Signal Managed by DB2605



In this example,

- The power is provided by USB Type-C
- The Control pilot PWM signal is generated and selected by DB2605
- Low power is enabled (J6 Jumper is not installed)
- Proximity Power is supplied to support Europe charge mode 3

8 SAFETY INSTRUCTIONS

To ensure safe use and avoid injury or property damage to yourself and others, please follow the safety instructions below.

- Avoid pressing or shaking the board hard during use to prevent loosening of internal connections and components.
- For malfunctions, stop use and seek professional repair.
- Before repairing or replacing any equipment components, make sure to turn off the power and disconnect from the device.