qBox PI Pico DIY IOT Enclosure Kit

User Manual

Abstract

User Manual describing the qBox PI Pico DIY IOT Enclosure Kit. Kits features, content provided.

IBT-QBX-RPP-X-UM

www.iot-bots.com

Table of Contents

Revision History

№№	Version	Date	Author	Description
1	1.0	05.01.2021	Iotbotscom	Initial
2				
3				

Overview

Perfect for any Raspberry PI PIco DIY IOT project, qBox PI PIco Enclosure Kit is the part of the newest HW platform designed to help hobbyists, makers and all DIYers to build environmental ready IOT solutions.

Features

- Flanged IP65 waterproof enclosure: Sealed, made of high-quality ABS material suitable for indoor and outdoor DIY IOT projects;

- Incorporated PG7 cable glands: Two cable inputs securely allow bringing the power in and connecting sensors and actuators;

- Perfect fit PCB: High-quality double-sided PCB with 0.1" hole spacing for DIP integrated circuits, modules, and PI Pico controller board;

- Fixed placement for controller board: Well-designed PCB allows to carry a PI Pico MCU board;

- Dedicated Connectors positions: Terminal blocks, Grove and 0.1" DIP power and interface connectors could be easily soldered onto the PCB;

- Arduino UNO compatible board carrier capability: Arduino UNO compatible board could be mounted at the top of PCB;

- Prototyping connectors set included: All necessary connectors included, saving time and allows to build IOT device right away.
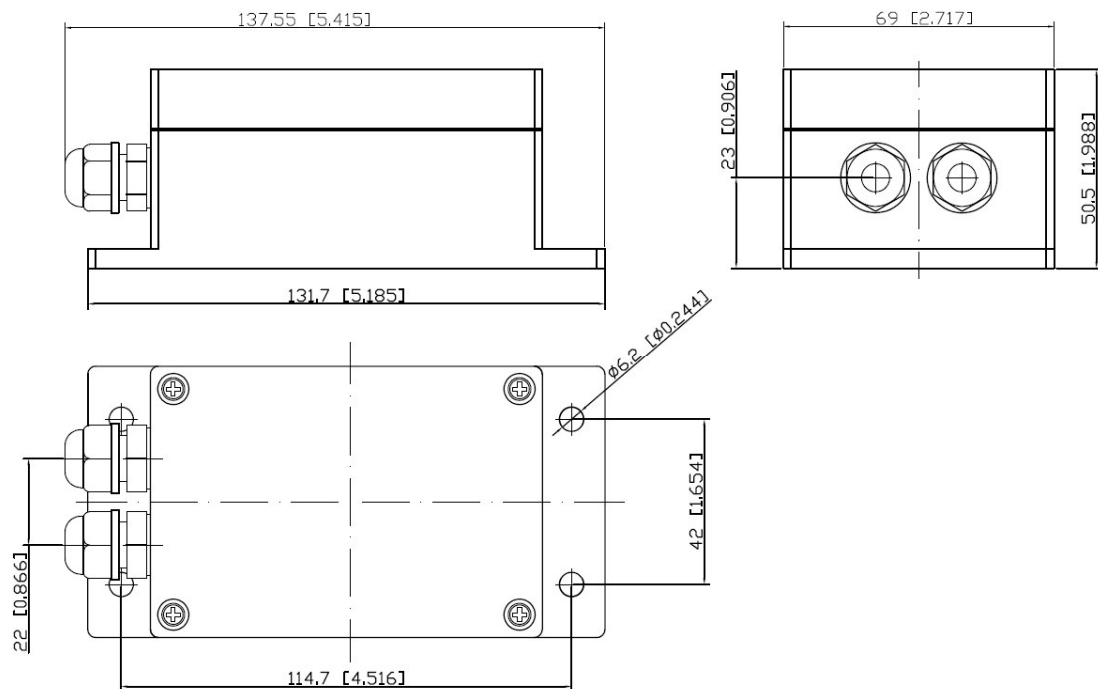
Description

Each qBox PI Pico Enclosure Kit consists of durable waterproof IP65 enclosure with installed PG7 glands, double sided PCB with dedicated placements for PI Pico controller board, connectors and connectors set.

For now, qBox PI Pico Enclosure Kit family is represented just by one simplest device which does not have any SMA connectors / adapter cables integrated.

qBox PI Pico Enclosure Kit has no integrated SMA to u.FL adapter cable, but still able to keep wireless connectivity device with internal antennas.
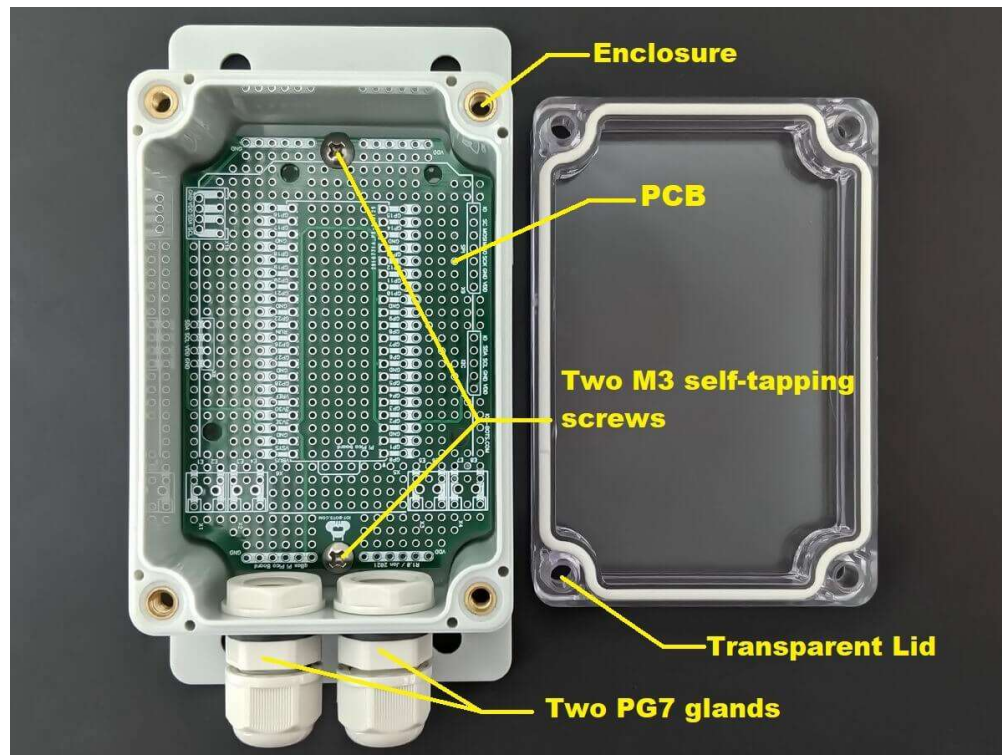

Pic.1. qBox PI Pico Enclosure Kit common view

Pic. 2. qBox PI Pico Enclosure Kit dimensions

qBox PI Pico Enclosure Kit parts

Each qBox PI Pico Enclosure Kit has got several parts built in.

Pic.3. qBox PI Pico Enclosure Kit parts

External DC voltage from power adapter or solar system could be brought by cable through the one gland inner and another gland gives opportunity to connect external sensors or actuators.

Two M3 self-tapping screws securely attach the PCB to the enclosure. Same time board could be easily removed.

Enclosure has enough room to keep with or without stacking header one PI Pico controller board, power supply (DC/DC), OLED display and sensor modules using plain grid proto holes.
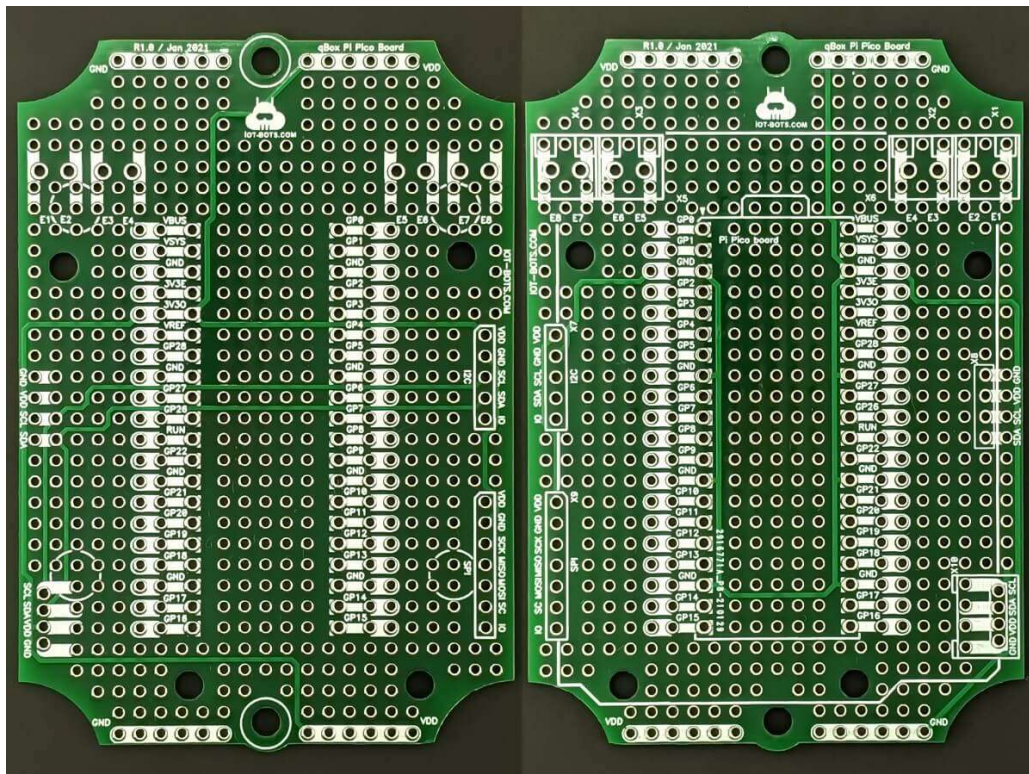
Pic.4. qBox PI Pico Enclosure Kit with PI Pico board installed

Pic.5. qBox PI Pico Enclosure Kit with PI Pico board installed

Up to four pluggable 3,5mm terminal blocks, one Grove and several DIP 0.1" I2C and SPI interface connectors could be populated. Two separate power traces for VDD and GND along short PCB sides allow bring the power to sensor boards.
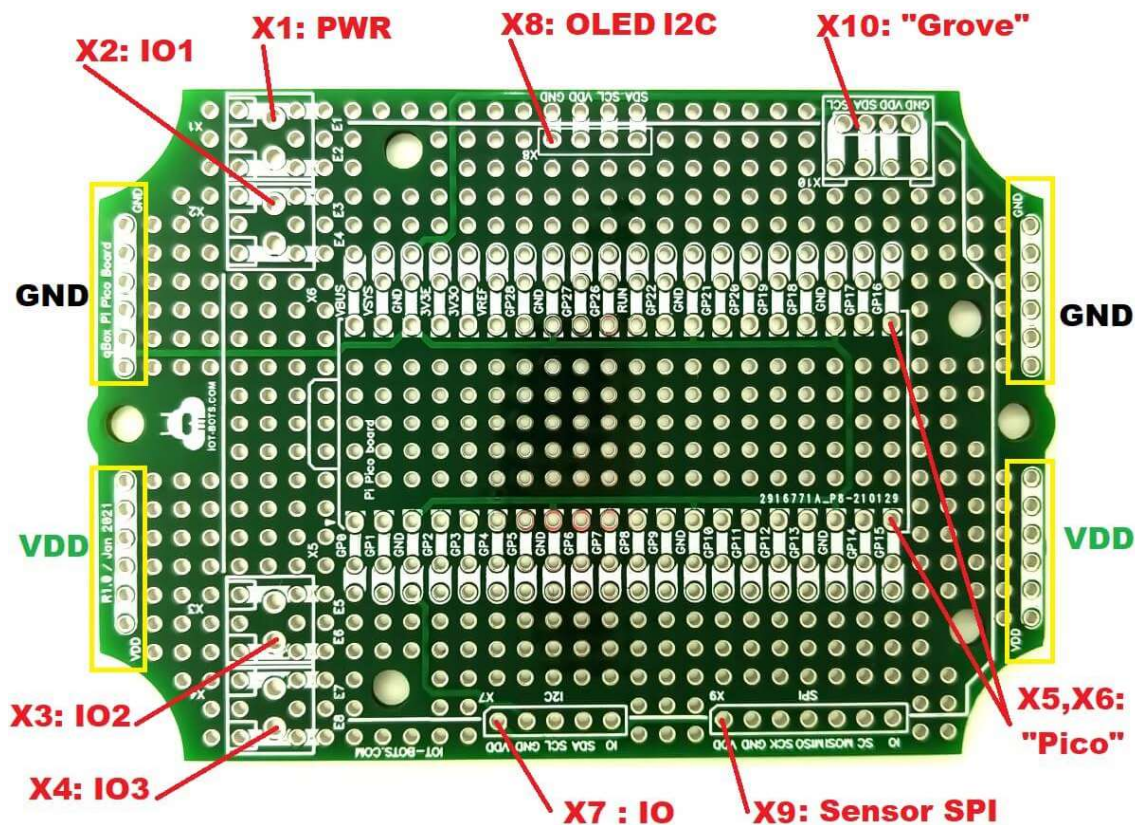

Pic.6. qBox PI Pico Enclosure Kit PCB common view (Front and Back)

Each connector pin has got a trace with DIP contacts that wires from other modules could be easily soldering.
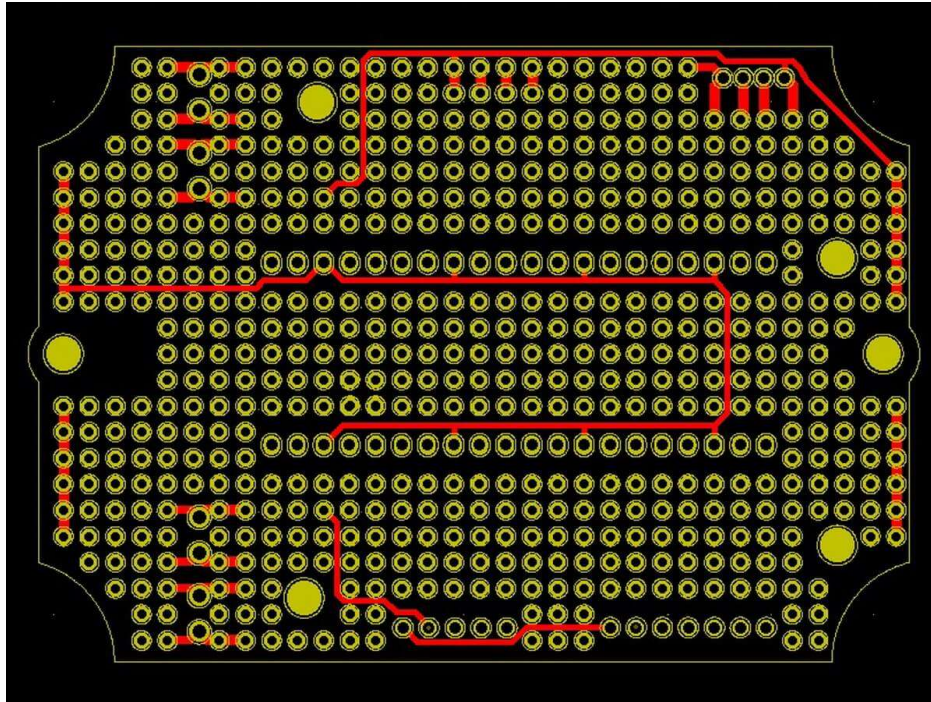
There is example of connectors proposal:

- X1: External power connection through pluggable 3,5mm terminal block;
- X2…X4: External Input / Output sensor / actuator connections through pluggable 3,5mm terminal blocks;
- X5, X6: PI Pico board connectors could be located (0,1" DIP);
- X7: I2C sensors connector placement (0,1" DIP) with pins: VDD, GND, SCL, SDA, IO;
- X8: OLED I2C connector placement (0,1" DIP) with pins: VDD, GND, SCL, SDA;
- X9: SPI sensors connector placement (0,1" DIP) with pins: VDD, GND, SCK, MISO, MOSI, CS, IO;
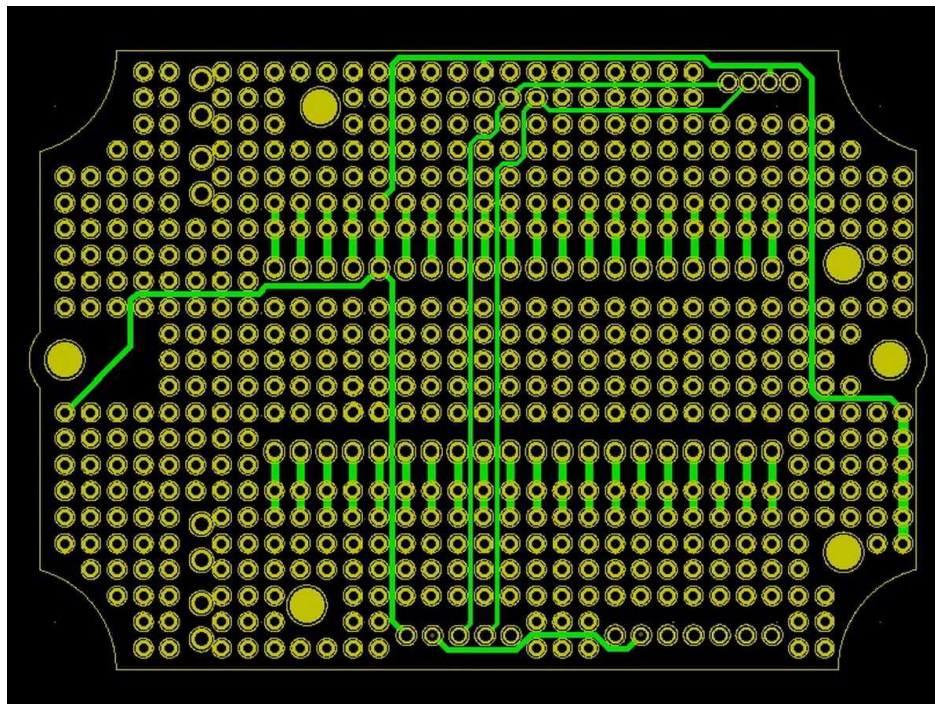- X10: "Grove" I2C connector placement (2,0 mm DIP) with pins: VDD, GND, SCL, SDA.

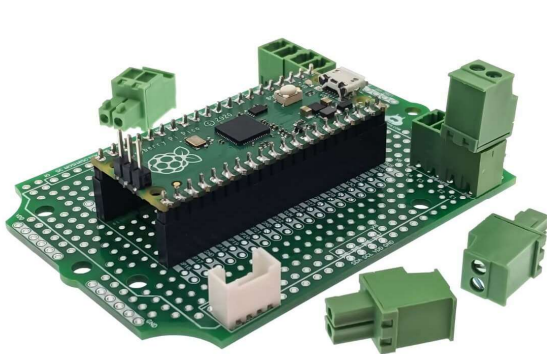Pic.7. Connectors placement proposal
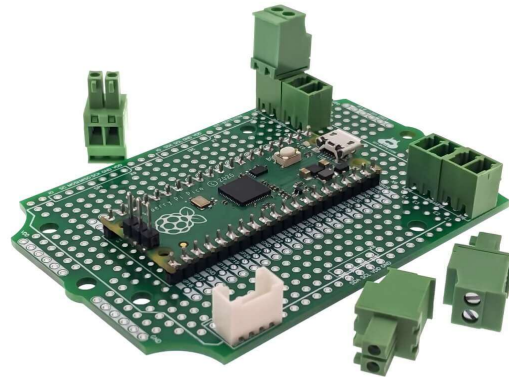
Pic.8. PCB Front Copper traces

Pic.9. PCB Back Copper traces

PI Pico board connector pins have names according to Raspberry PI Pico controller specification.
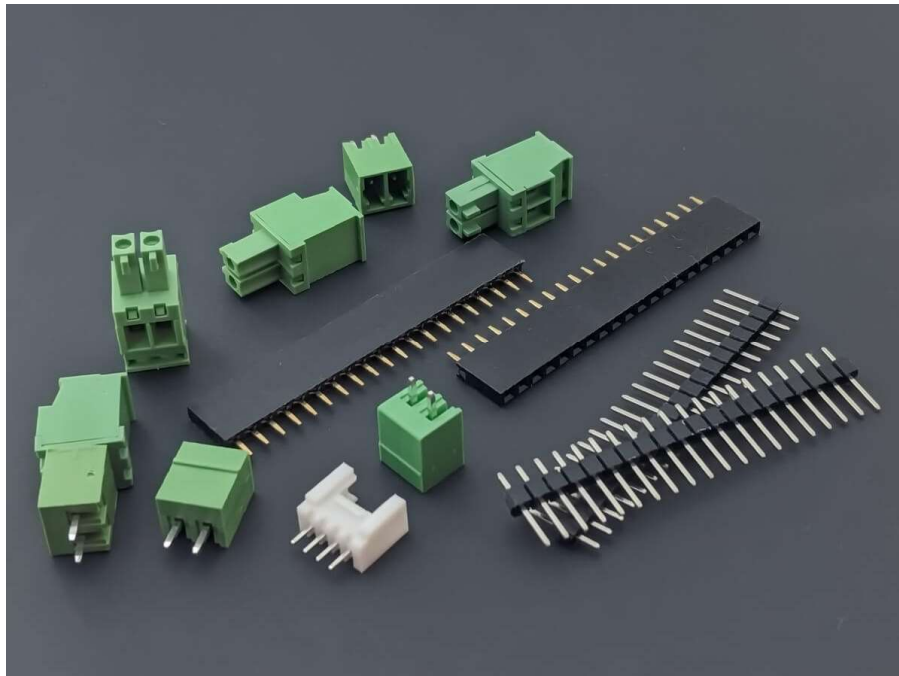

Pic.10. qBox PI Pico Enclosure Kit PCB with board connectors installed
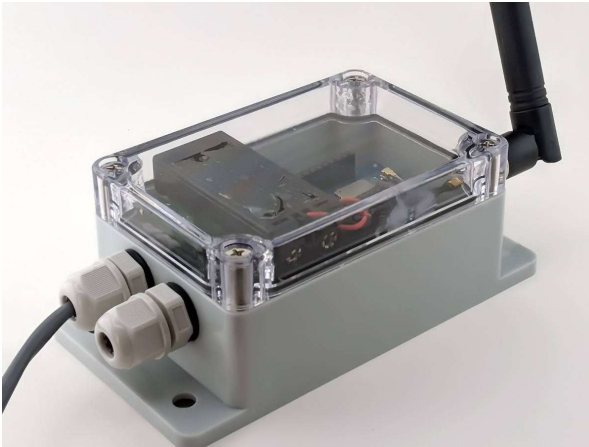
Pic.11. qBox PI Pico Enclosure Kit PCB with board installed directly to PCB

qBox PI Pico Enclosure Kits include connector set, that saves time and efforts for logistic and helps to build IOT device right out of the box.
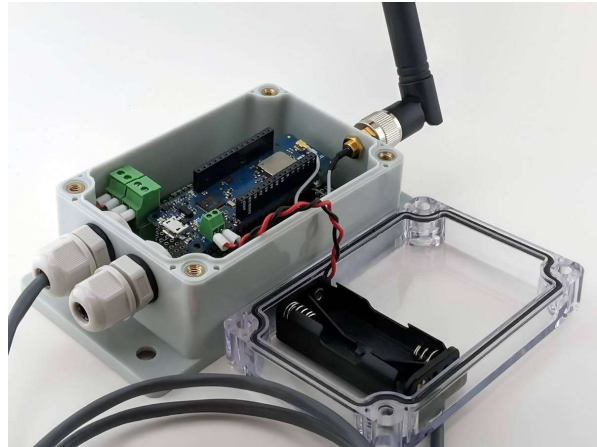

Pic.12. qBox PI Pico Enclosure Kit Connectors Set

Transparent lid allows to see internal parts, electronics, LEDs and even display and is able to hold LiPol battery or battery holder to be applied to the internal surface.

Pic. 13. 2xAAA battery holder apllied to a tranparent lid (qBox Enclosure Plus One SMA Kit)

Pic. 14. 2xAAA battery holder apllied to a tranparent lid (qBox Enclosure Plus One SMA Kit)

Specification

Housing Material: ABS

Water and Dust Proof: IP65

Enclosure Outer Size: 5.42"x2.72"x1.99" (L*W*H)

Enclosure Inner Size: 3.69"x2.42"x1.7" (L*W*H)

Gland model: PG7

Cables with diameters: 0.12-0.25"

PCB size: 3.46"x2.36"

Connectors set:

- PI Pico board female header set (two 0,1" pitch 1x20 pins connectors);
- PI Pico board male header set (two 0,1" pitch 1x20 pins connectors);
- Four 3,5mm 2 pins terminal blocks with plugs;
- Seeed Grove 2mm DIP connector.

qBox PI Pico Enclosure Kit content

- IP65 waterproof enclosure with two PG7 glands installed;
- High quality prototyping double sided PCB mounted with two M3 self-tapping screws;
- Connectors set (**connectors are NOT populated onto PCB**);
- Packaging bag and shipping box.

!!!Please note, Raspberry PI Pico board IS <u>NOT</u> included!!!

Abbreviations

№№	Abbreviation	Explanation
1		
2		

Trademark notice

All referenced brands, product names, service names, and trademarks are the property of their respective owners.

Ordering info

№№	Item	SKU
1	qBox PI Pico DIY IOT Enclosure Kit	IBT-QBX-RPP-0
2		
3		