IoTa 2DL 12V | Quick installation guide

KISTERS

Package contents

1x IoTa 2DL 12V
4x stainless steel mounting feet and screws
1x USB-B to USB-A cable, 0.5 m
1x Quick Installation Guide

Specifications summary

Inputs:

≤ 8 SDI-12 devices; ≤ 500 mA@12 VDC

1 counter/pulse input, pull-to-GND

Data Transmission:

LTE CAT M1/LTE CAT NB2

Micro SIM

MQTTS 3.1 w/JSON payload

IT/Data Security:

TLS 1.3, supports client- and server-side certificates

Unique Client-Site certificate for communication to KISTERS datasphere included

Memory:

8 MB flash memory

Internal Parameters:

Temperature, Supply Voltage, RSSI

Power Supply:

Operating: 10 ... 16 V DC (12 V nominal)

Consumption: 40 mW (sleep) + 1000 mW peak communication

Operating Temperature:

-20 °C ... +70 °C (-4 °C ... 158 °C)

Housing:

IP20, polycarbonate

LxWxH 166 x 86.5 x 55 mm

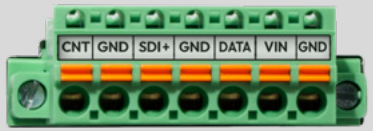
Compliance

CE, RoHS

IoTa 2DL 12V – Main Components

1. Power and Signal Spring Terminal
2. Synthetic Plug Cover of USB-B Port
3. Lid Retaining Screw (1 in each corner)
4. USB-A / USB-B cable, 0.5 m
5. Mounting feet

Power and Signal Connections (spring)



CNT:	GND:	SDI+:	GND:	DATA:	VIN:	GND:
Counter/ pulse input	Ground	sensor power output	Ground	SDI-12 data	IoTa 2DL supply voltage	Ground

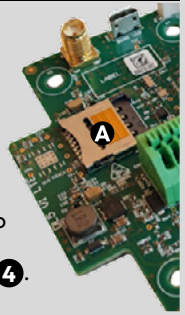
USB-B Connection (local configuration)

Vertical USB 2.0 B-type male connector on PCB. To access the USB-B port, unlock round the synthetic plug 2 on the device front.

USB-A to USB-B (female) cable:

Mounting Instructions

1. Prepare the Device



- Unpack the unit and place it on a stable surface.
- **Datasphere pre-configured – move to section 2 ↓**
- Loosen the four corner screws 3 and open the lid.
- Insert the micro SIM card into the micro SIM (3FF) Connector – Slide-Lock, Hinged Tray Type (A)
- Slide the tray lid slightly towards the soldered end to flip it open.
- Close the lid (Tighten securely by hand. Do not over-tighten.).
- Unscrew the slotted plug 2 using coin or a wide flat-blade screw driver to access the USB-B port.
- Connect the USB-B to your PC using the provided USB-A or USB-B cable 4.
- Start HyComm and follow on-screen instructions.

2. Powering and Configuration

- Connect 12 V to power up the device.
- Unscrew the slotted plug 2 using coin or a wide flat-blade screw driver to access the USB-B port.
- Connect the USB-B to your PC using the provided USB-A or USB-C cable 4
- Start **HyComm** and follow on-screen instructions.
- APN settings are required when using your own SIM card.
- Units purchased via a KISTERS datasphere account usually include a pre-configured SIM for direct cloud transmission.

3. Backplate or Wall Mounting

Note: The IoTa 2DL 12V is IP20 and must be installed in a **protective cabinet for outdoor use.**

- The IoTa 2DL 12V includes 4 mounting feet and screws.
- Attach the feet to the back of the enclosure. The slotted holes fit M5 screws (not included).
- Backplate: use self-tapping screws // Wall: use wood/general screws with wall plugs.

4. Alternative Installation – KISTERS iBOX

- KISTERS iBOX Compact is a small cabinet pre-cabled w/ IoTa 2DL, solar controller, 12V:7.2Ah SLA battery, external sensor and solar connectors. For the iBOX IoTa 2DL 12V, follow the instructions supplied with the iBOX.
- The iBOX supports wall-mount or pole-mount brackets (defined at order time).

⚠ Safety Instructions

- Read this Installation Guide (IG) including all operating instructions prior to installing and connecting the KISTERS IoTa 2DL 12V.
- For use by qualified personnel only! KISTERS IoTa 2DL 12V are intended to be used in professional IoT monitoring applications.
- Keep the IG on hand for later reference!
- If you encounter problems understanding the information in the IG (or part thereof), please consult the manufacturer or its appointed reseller for further support.
- Do not install and deploy the sensor in hazardous areas, especially not in areas with a danger of explosion!
- Electrical, technical and climatic specifications must be respected at all times.
- Changes or retrofits to the KISTERS IoTa 2DL 12V will void the warranty.
- Comply with electrical safety standards.
- Comply with Health, Safety and Environment regulations and directives.

MQTTS and Data Payload

MQTTS

MQTT is a lightweight, binary-coded, bi-directional messaging protocol over TCP/IP.

The IoTa 2DL 12V acts as an MQTT client and publishes to a configured broker..

Quick Configuration

— **IoTa 2DL 12V as a KISTERS datasphere client:**
  - pre-configured, no user action required.

— **User- or 3rd party-operated broker:**
  - MQTT Server Address: Broker host or IP
  - MQTT Server Port:
    - 1883 = MQTT
    - 8883 = MQTT over TLS
  - **Device ID:** fixed = device serial number (S/N)
  - **Authentication:**
    - **Variant 1:** Username and Password
    - **Variant 2:** Certificate-based (factory certificates included; user may replace them)
      - Option 1 – TLS without certificate validation
      - Option 2 – TLS with server certificate
      - Option 2 – TLS with client and server certificate
  - **Protocol Settings:**
    - Protocol Version: MQTT 3.1
    - Quality of Service (QoS): 1
    - Retain Flag: ON (broker keeps last message)
    - Connection Timeout: 120 seconds (factory default , max. time to wait for broker response

Payload in JSON Format

— time: timestamp,
  - format YYYY-MM-DD hh:mm:ss,
  - where
    - YYYY=4-digit year, MM=2-digit month, DD=2-digit day,
    - hh=2-digit hour, mm=2-digit minute, ss=2-digit second

Temperature: internal temperature on the electronics board, unit °C
Supply Voltage: supply voltage, last character “V” for unit Volt
Precipitation: counter/pulse input, dimensionless number of counts
SDI12A_0 ... SDI12A_7: readings of the up to 8 connected devices or channels
  - SDI12A_n, where ‘n’ is the sensor address between 0 and 7
  - For each SDI-12 sensor: { one or several user-specified parameter key(s) }
    - “<param_name>”: “<reading><u>”, where
      - <param_name>: is the name of the measured parameter as specified by the user in HyComm
      - <reading>: is a raw or aggregated reading from the sensor channel
      - <u>: is the physical unit assigned to readings of <param_name>

```
{
    "time": "2025-11-24 09:41:00",
    "Temperature": "9.55",
    "Supply_Voltage": "12.53V",
    "Precipitation": "0.0",
    "SDI12A_0": {
        "Level": "5.03m",
        "Temperature": "9.55C"
    }
}
```

Sensor Connection

Configuration is done using KISTERS HyComm (free software; see HyComm User Manual)..

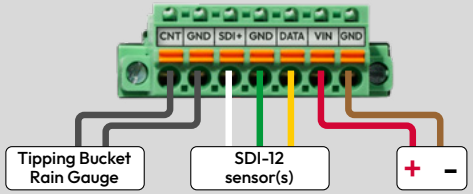
SDI-12 Sensors:

— 3-wire connection:
  - Power, Ground, Data

— Follow the sensor’s wiring instructions.

— KISTERS standard SDI-12 color code
  - White = SDI-12 Power
  - Green = Ground
  - Yellow = SDI-12 Data

— CAUTION: Each SDI-12 sensor must use a unique address (0–7).



Tipping Bucket Rain Gauges (TBRG):

Reed-switch output: 2-wire, no polarity.

Open-collector output: observe polarity (connect signal return to GND).

The IoTa 2DL 12V counts pulses over a user-defined interval (via HyComm).

— Caution: Only one pulse-output TBRG can be connected.

Accessories

datasphere: KISTERS datasphere is a cloud-based platform for sensor data visualization, alarming, and integration—ideal for applications ranging from sensor networks to environmental monitoring, infrastructure, smart cities, and data-driven business models.

datasphere.online

Tipping Bucket Rain Gauges: KISTERS offers wide selection of high-quality, accurate tipping bucket rain gauges for hydrometeorological, environmental, agrometeorological or urban monitoring. The IoTa 2DL 12V counter input supports traditional pulse-output gauges.

SDI-12 Sensors: KISTERS provides SDI-12 sensors such as shaft encoders, soil-moisture probes, vented hydrostatic pressure sensors, radar level/velocity sensors, bubblers, weighing rain gauges, etc. The IoTa 2DL 12V supports SDI-12 1.3 compliant sensor.

HyComm software: User-friendly, free, and available for Windows and Android. Supports configuration and local data download.

KISTERS Downloads

IoTa 2DL 12V User Manual

HyComm Software (free)