

# GEMINI 2000

## CONTACTLESS EMV PAYMENTS



Fully certified contactless payment solution for unattended POS

Visa and Mastercard acceptance, including Google Pay and Apple Pay

Fast transaction processing, detailed reporting and easy refunds

Highly secure system certified to Payment Card Industry standards

Fast delivery, working directly with UK manufacturer

## TAP INTO CONTACTLESS

Tap into the potential of contactless with Gemini 2000, a specialist manufacturer based in the United Kingdom. For over 25 years, we've helped businesses large and small offer seamless contactless acceptance in their vending machines, electric vehicle chargers, public transit systems, and more.



### Contactless reader

The uCrypto contactless reader offers acceptance of Visa and Mastercard bank cards, as well as smartphones and wearables. The reader comes with a bright OLED display and choice of robust flush and surface mount casings, including a waterproof option.

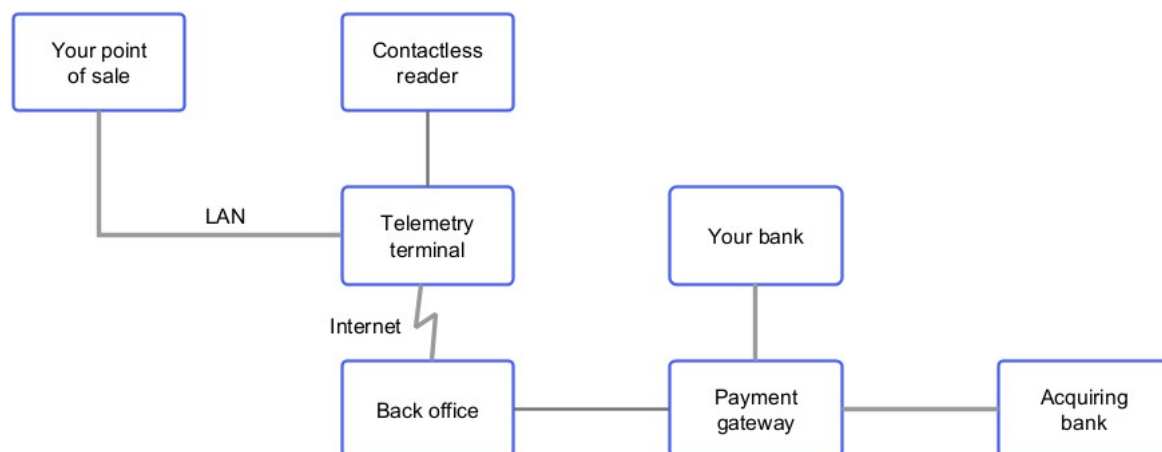
### Telemetry terminal

The telemetry terminal is an open Linux platform that hosts business logic and interfaces with your POS. It offers connectivity options such as Ethernet, WiFi or 4G. An optional MDB/Pulse module also is available for interfacing with vending machines.

This two-part system design – with separate reader and telemetry – allows you to position modules more conveniently inside the POS enclosure and reduces costs if replacements are ever needed. Both are designed and built in the UK and can be delivered fast to customers both locally and internationally.

## THE TRANSACTION JOURNEY

Your POS is typically the beginning of the transaction journey, instructing the Telemetry terminal to initiate a transaction on the contactless reader. Once the card data has been read and encrypted by the reader, it is passed to our back office. The back office redirects the transaction to the Payment Gateway, which performs financial checks with the acquiring bank and responds with an Accept or Decline.



## SOFTWARE INTEGRATION

### Command protocol over MQTT

The exchange between POS and payment terminal is based on MQTT messages over an Ethernet connection. The central point is the MQTT broker running as a server on the terminal and both the POS and terminal can send and receive messages asynchronously at any time. Find out more in our technical guide.

► See *G2K Terminal – Technical Reference*

### Open and closed loop support in one reader

The contactless reader can handle different types of card schemes, open and closed loop, or a mixture, independently of each other. Payment processing (open loop) in the reader is certified by the banking industry, while closed loop schemes, for example Mifare membership cards or transport schemes ITSO and Calypso, are executed separately by the telemetry terminal via the reader's Pass-through mode.

# SECURITY

## Hardware security

The Crypto line of contactless readers is named after their key feature - the built-in cryptographic processor. This is a hardware component designed to encrypt cardholder data at source, ensuring data leaving the reader is rendered useless to third-parties.

Telemetry terminals also secure their communications with certificates for TLS connections with the payment service provider, adding another layer of security.

Our hardware and processes are subject to rigorous testing and certification: we hold *EMVCo Level 1* and *2* certificates, and our manufacturing facility is audited by TÜV SÜD and certified to the Mastercard *Terminal Quality Management* standard.

## Remote update

With ever-changing functional, regulatory and security requirements, over-the-air update is a must for any new payment solution. All Gemini hardware has capabilities for remote management and updates through a dedicated Terminal Management System.

Each individual reader is compatible with a unique firmware file only and is therefore protected from loading incorrect or unauthorised firmware.

Remote updates are carried out with minimal disruption to customers at agreed maintenance time slots.

## End-to-end encryption and DUKPT

Readers hold unique secret keys to encrypt cardholder data, which can be decrypted only by the scheme's payment service provider – this is known as *E2EE* (end-to-end encryption.) It secures all communications, preventing cardholder data from being read or modified while in transit.

Further, the solution employs *DUKPT* (derived unique key per transaction), again in agreement with the payment service provider. With this approach, each individual transaction is encrypted with a key that is then immediately discarded. If a derived

key is ever compromised, it only affects that single transaction and is not applicable to any other past or future transactions.

## **PCI DSS compliance**

Cardholder data sent to the payment service provider must be decrypted, processed and stored securely. Our payment service provider is *Payment Card Industry Data Security Standard* (PCI DSS) compliant, and certified as a *Level 1 Service Provider* (the highest level possible.)

## **PCI PTS options**

The features above meet and exceed industry standards for security. However, in some high-risk applications, additional protection may be required. In those cases, we offer the option to use *PCI PTS v5.1* certified variants of our Crypto line of readers. This adds active tamper protection and mechanical security, however introduces the need for an uninterrupted power supply from batteries and operational requirements for logistics and storage. Contact us to discuss if PTS is right for you.

# ONLINE PORTAL

## Reporting

Merchants have 24/7 access to real time reporting via the Switchio platform. Log in to create sales reports and drill down into individual transactions.

| UUID        | Terminal Date            | Terminal Acq/Iss      | Amount    | State         | RC   | issRC/AcqRC | Dst stan     | Variable symbol |
|-------------|--------------------------|-----------------------|-----------|---------------|------|-------------|--------------|-----------------|
|             |                          | Merchant Acq/Iss      |           | Approval code | Type | Processor   | RRN          | Masked PAN      |
| 2e729705... | 13. 10. 2021<br>12:38:04 | T TL920202 / HP649202 | 50.00 EUR | ACCEPTED      | 00   | 00 / 000    | 614773       | 1210779422      |
|             |                          | M SKYTOLL / 649202    |           | 719039        | @    | DANUBEPAY   | 128612614773 | 516927*****1933 |
| 480f269f... | 12. 10. 2021<br>10:10:53 | T DZ920202 / HP639202 | 10.00 EUR | ACCEPTED      | 00   | 00 / 000    | 613185       | 2112464654      |
|             |                          | M SKYTOLL / 639202    |           | 067632        | @    | DANUBEPAY   | 128510613185 | 476173*****0135 |
| 8142d1e2... | 12. 10. 2021<br>10:09:40 | T DZ920202 / HP639202 | 50.00 EUR | ACCEPTED      | 00   | 00 / 000    | 613182       | 2112464648      |
|             |                          | M SKYTOLL / 639202    |           | 052943        | @    | DANUBEPAY   | 128510613182 | 476173*****0135 |

## Receipts and refunds

Receipts are available in the reporting platform and available to the merchant as exportable PDFs. Refunds are fast and easy to issue too – email us or give us a call with the transaction reference.

The screenshot shows the Switchio Admin Portal Web interface. The main content area displays transaction details for a specific transaction with the following information:

- Transaction ID:** 2D330CFB-03A8-452A-94BF-9B928DBD007E - 2022-01-10T22:06:36
- Buttons:** REVERSE, REMOVE FROM SETTLEMENT, REFUND
- Transaction detail:**
  - UUID: 2d330cfb-03a8-452a-94bf-9b928dbd007e
  - Terminal date: 10. 01. 2022 22:06:36
  - Server date: 10. 01. 2022 15:06:44
  - Type: @ PURCHASE\_ONLINE
  - State: ACCEPTED
  - Response code: 00 APPROVED
  - Issuer response code: (empty)
- Amount:**
  - Amount: 1
  - Currency: CZK / 203
- Identification:**
  - Approval code: 001052
  - Src stan: (empty)
  - Dst stan: 7039

## PRICING

### Competitive, straightforward pricing

All costs for the system are outlined below - hardware costs are one-off and payable upfront, and ongoing charges are due monthly after activation.

| Hardware cost      |         |
|--------------------|---------|
| Contactless reader | £129.00 |
| Telemetry terminal | £49.00  |
| WiFi module        | £19.00  |
| 4G module          | £39.00  |

| Ongoing fees            |                                    |
|-------------------------|------------------------------------|
| Terminal management fee | £6.99 per terminal per month       |
| Transaction fee         | 2% depending on sales volume       |
| Refund fee              | £0.45 per transaction              |
| 4G data                 | Direct contract with data provider |

### Test and development kit

Evaluate the solution with our £199 starter kit. This includes a reader, terminal, WiFi module, ICC test card and set up in our test environment. Contact us to order.

### Do you have your own gateway?

If you have payment processing software and can obtain your own a EMV Level 3 certificate, Gemini can act as a hardware-only supplier and provide Level 1 and 2 certified readers with no transaction fees.

### Get in touch

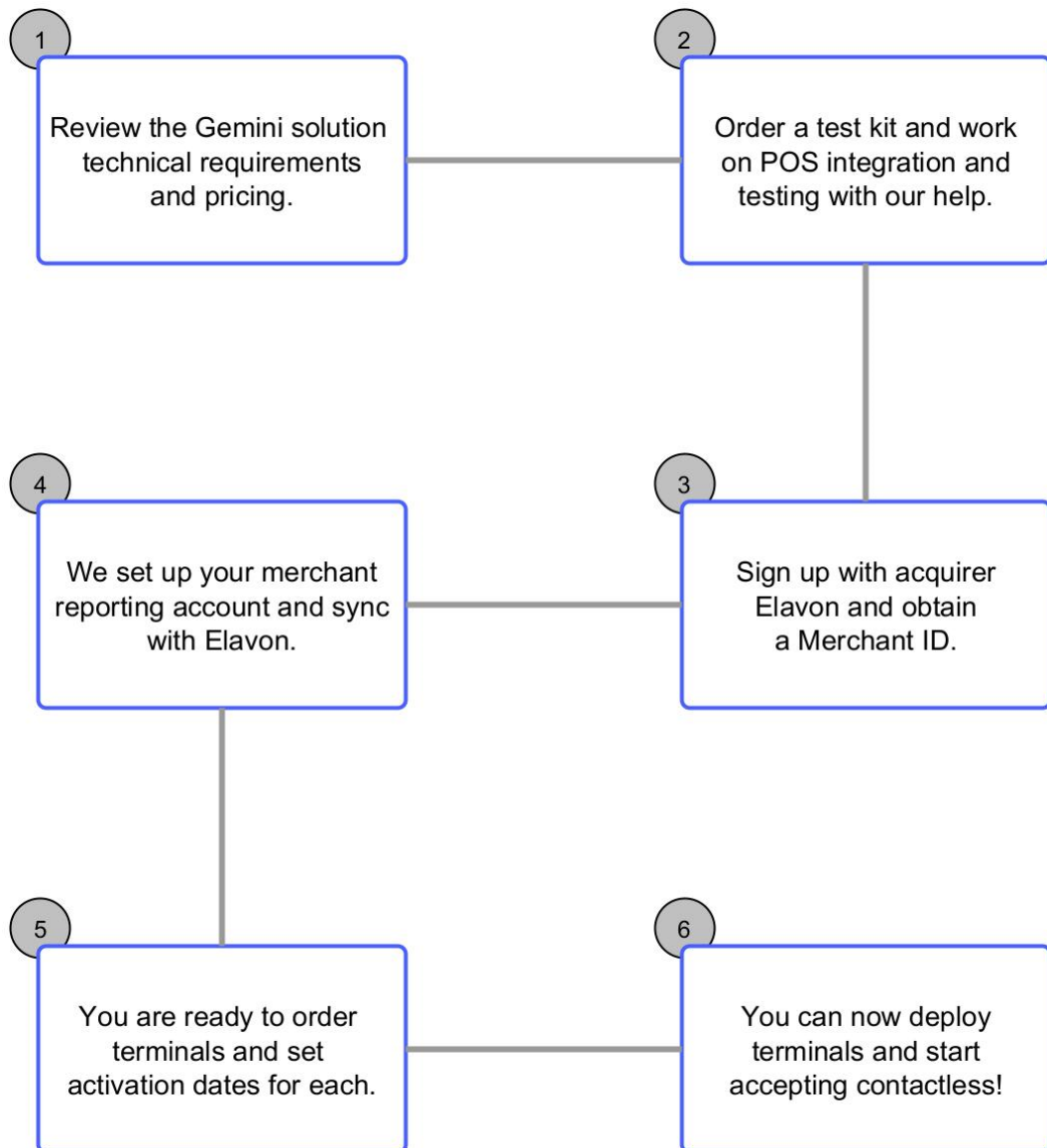
You can reach us on:

[info@gemini2k.com](mailto:info@gemini2k.com)

+44 (0)1202 666 700

## ROADMAP TO LAUNCH

Our consultative approach means that you can count on our assistance through every step of adopting contactless. Typically, this is a six-step process:





## Before you buy – your integration checklist

Will your POS device work with our hardware? This checklist outlines some important considerations:

- Size. Check mechanical fit. (See Appendices.)
- Radio interference. Ensure there are no metal objects within 2cm of the reader antenna. A plastic surround might be needed when integrating into solid metal enclosures.
- Thermals. No electronic parts should not be installed near excessive heat sources and kept within stated operating temperature range at all times.
- Power supply. The requirement is for 12V 1A.
- Waterproofing. If positioning the reader outdoors, remember to specify the IP65 option when ordering.

Terminal-specific requirements:

- Local area network. When using the terminal, messages from the POS are transmitted over an Ethernet connection via a CAT5 cable.
- MQTT agent. Messages are sent over MQTT and your POS needs to be capable of running a compliant agent.
- Internet connectivity. Order your terminal with a built-in 4G modem, or share your existing POS' Internet connection if available with the terminal through LAN or WiFi.

## APPENDICES

### Reader specification

#### Physical specifications

|                   |  |
|-------------------|--|
| Dimensions        | 65x75x28 mm (OEM module)                                 |
| Weight Approx.    | 40g (OEM module)   |
| Status Indicators | Beeper<br><br>4 LED indicators<br><br>1 health-check LED |

#### System

|                  |             |
|------------------|-------------|
| MCU              | Kinetis K81 |
| Operating System | FreeRTOS    |
| Clock rate       | 150MHz      |

#### Contactless interface

|                         |                                   |
|-------------------------|-----------------------------------|
| Operating Frequency     | 13.56 MHz                         |
| Chipset                 | PN5180                            |
| Communication Standards | ISO 14443 (Type A & B), ISO 18092 |
| Card Reading Distance   | Up to 70mm                        |
| Transmission Speed      | Up to 848Kbps                     |

#### Contact interfaces

|            |   |
|------------|---|
| Card Slots | One spare SAM card slot<br><br>Expansion boards available |
|------------|---|

## Connectivity

|                |                             |
|----------------|-----------------------------|
| Host Interface | RS232, Serial UART, USB CDC |
|----------------|-----------------------------|

|                     |               |
|---------------------|---------------|
| Power Supply        | 5V DC         |
| Current Consumption | 350mA@5V peak |

## Security

|  |
|--|
| Cryptography: DES/3DES, AES, RSA, SHA-1, SHA-256 |
|--|

## EMV certification

|                                 |
|---------------------------------|
| EMV Level 1                     |
| EMV Level 2 Visa and Mastercard |
| TQM Label                       |

## Application interface

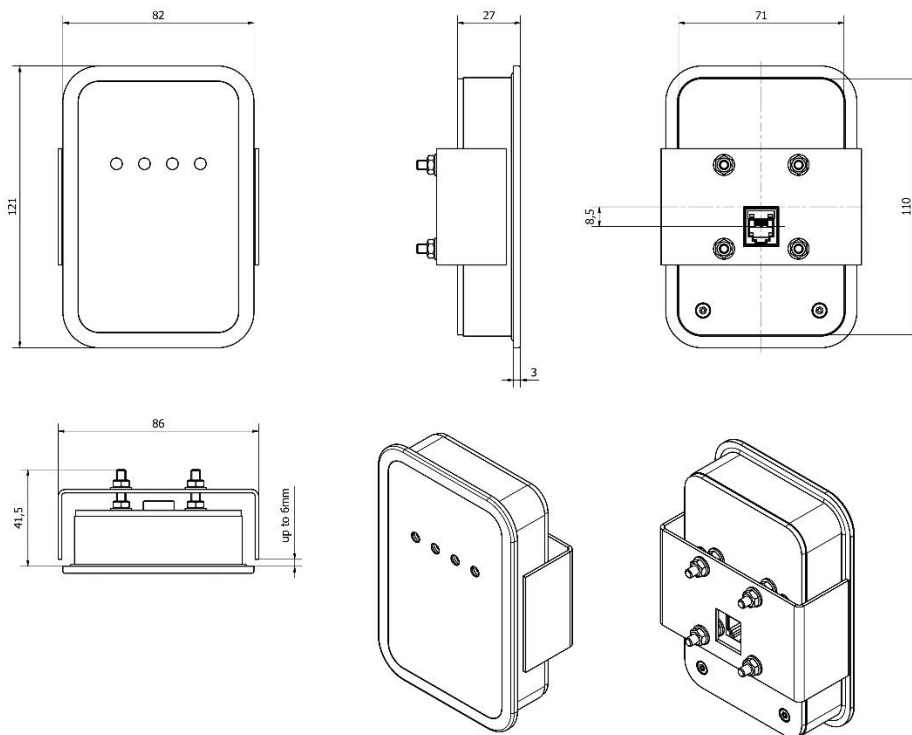
|                |                                     |
|----------------|-------------------------------------|
| Supported APIs | G2K API<br><br>Crypto Interface API |
|----------------|-------------------------------------|

## Operating conditions

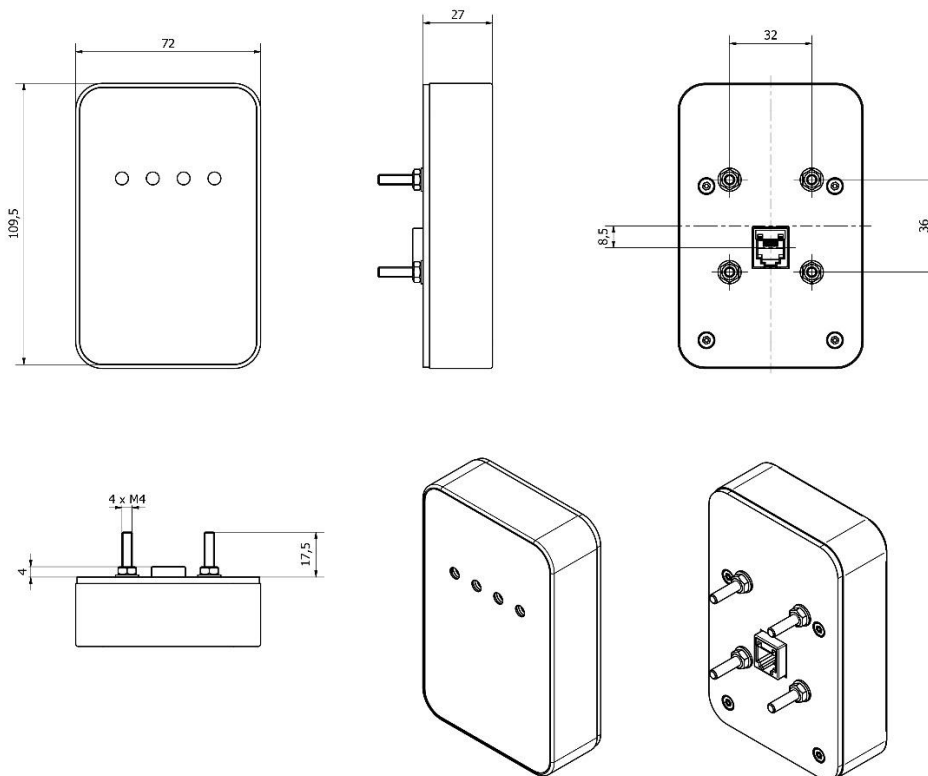
|                           |                      |
|---------------------------|----------------------|
| Operating Temperature     | -25 to +80 °C        |
| Non-Operating Temperature | -40 to +85 °C        |
| Operating Humidity        | 0-95% non-condensing |
| MTBF                      | 500,000 hours        |

## Reader casings

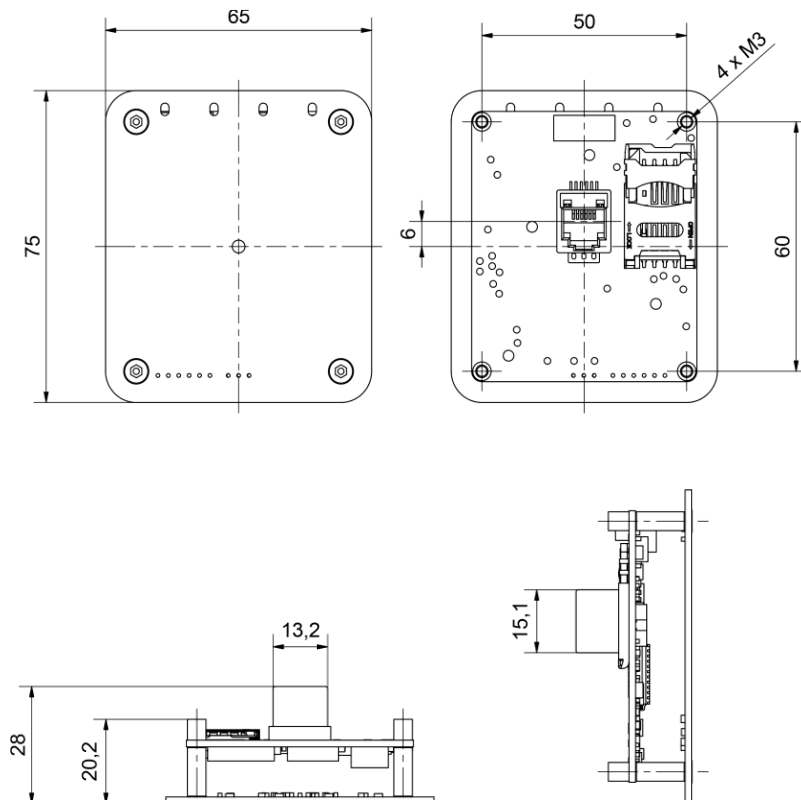
Flush mount – shown with a U-shaped holder bracket.



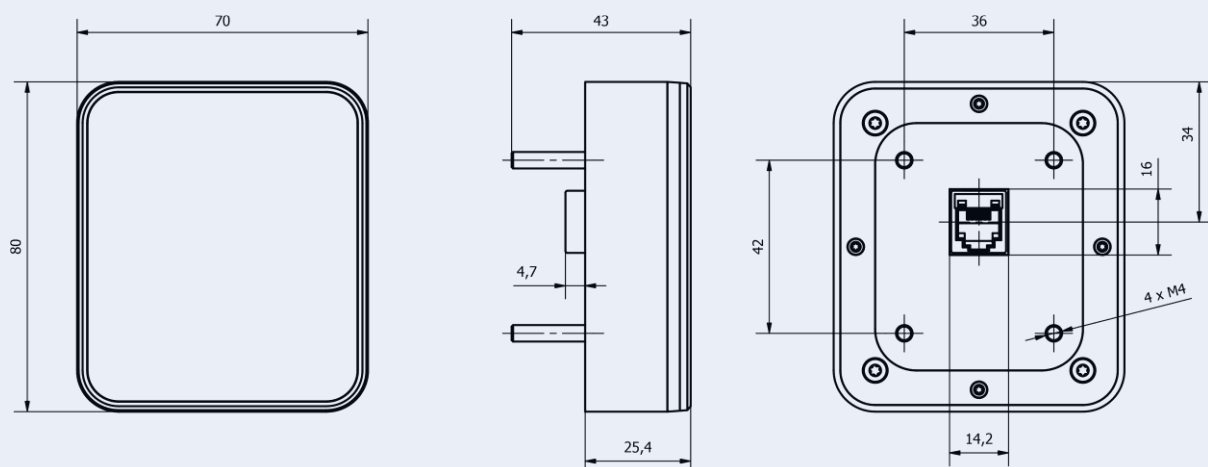
Raised mount – for surface installation.



OEM module for installing inside your enclosure. This is possible when a 3mm thick non-metal front cover is used. EMV re-certification requirements may apply.



New! Compact reader coming out in Q4 2022.



## Telemetry terminal specification

### Physical specifications

|                   |                                 |
|-------------------|---------------------------------|
| Dimensions        | 150x85x36mm                     |
| Weight            | 170g                            |
| Status indicators | 2 health check LEDs, 2 LAN LEDs |

### Computer core

|                  |                     |
|------------------|---------------------|
| Chipset          | Cortex-A7 at 1.2GHz |
| Memory           | 64MB DDR2 RAM       |
| Operating system | Ubuntu              |

### Power supply

|                   |                                       |
|-------------------|---------------------------------------|
| Power supply      | 12V DC via Molex 43045-0402 connector |
| Power consumption | 200mA typical, up to 2A with 4G modem |

### Interfaces

|          |                                     |
|----------|-------------------------------------|
| Ethernet | 10/100M Ethernet via RJ45 connector |
| WiFi     | 802.11bgn 2.4G module (optional)    |
| 4G       | 4G modem (optional)                 |
| Serial   | For connecting debug cable          |

### Operating conditions

|                           |                      |
|---------------------------|----------------------|
| Operating temperature     | -20 to +70 °C        |
| Non-operating temperature | -40 to +85 °C        |
| Operating humidity        | 0-95% non-condensing |

## Telemetry terminal casing

The terminal connects to the reader via a cable slotting into a locking RJ12 connector. When using 4G additional space is needed at the top for an antenna.

