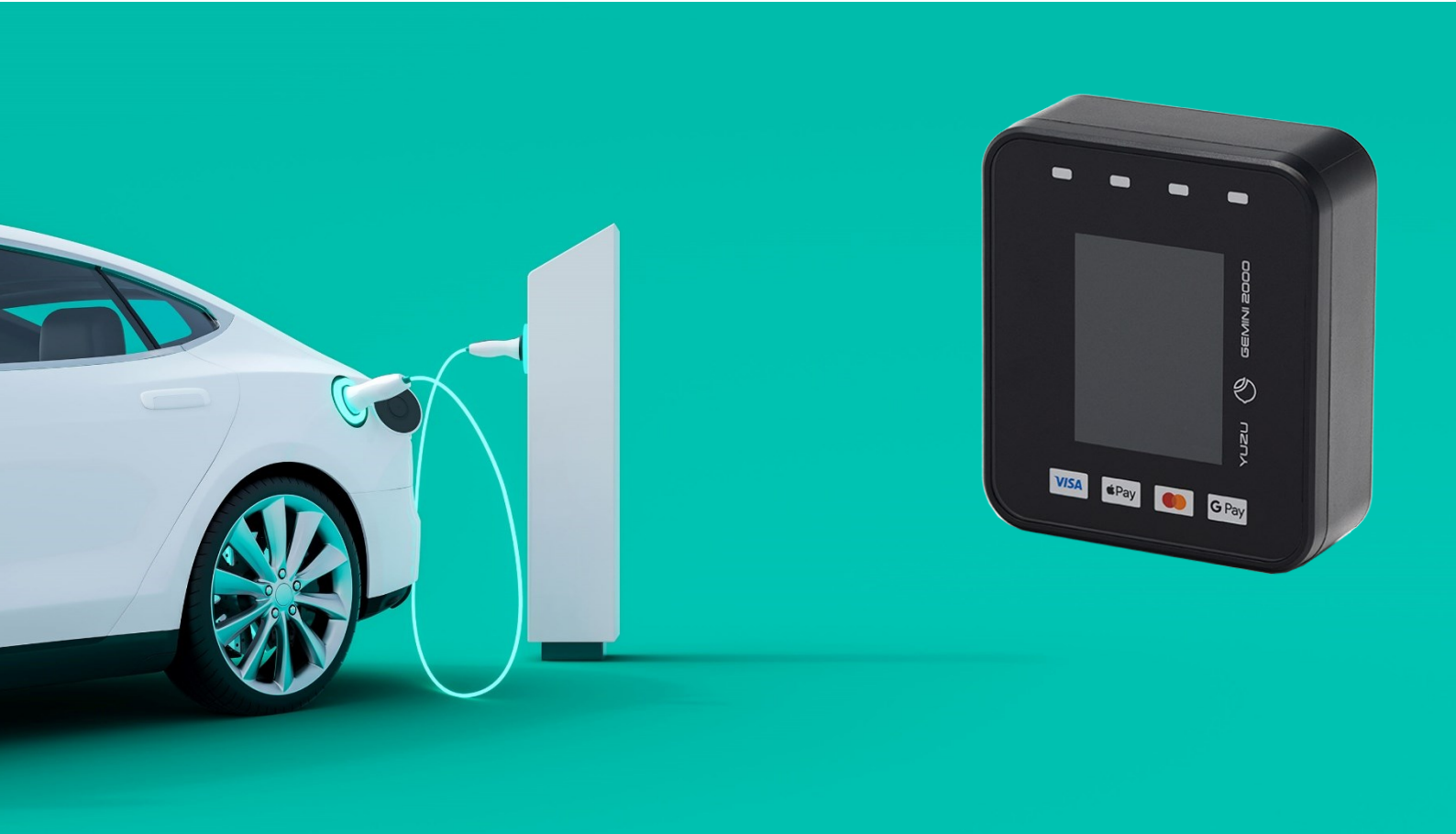# GEMINI 2000

CONTACTLESS PAYMENT SOLUTIONS

Fully certified contactless payment solution for unattended POS

Fast transaction processing and real-time reporting

Highly secure system certified to Payment Card Industry standards

Work directly with UK manufacturer

TAP INTO CONTACTLESS

A trusted partner

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

Consultancy and assisted integration

We offer a flexible, consultative approach where a truly no-obligation discussion can be had. Backed up by years of experience in both technical design and the industry approval process means you can tap into our wealth of knowledge and understanding to help you get started.

Secure, low-cost transaction processing

Adopt the speed of contactless with card taps processed almost instantly through our acquiring partner Elavon. Accumulated funds are quickly transferred from the acquiring bank to your bank account within 1 to 3 days.

All merchants have 24/7 access to Switchio, a comprehensive online reporting platform where sales reports and detailed information for each transaction are available at a click of a button.

HARDWARE OPTIONS

We understand that one size doesn't fit all. That's why we provide a flexible approach, enabling you to select individual hardware and software modules. This ensures the delivery of a customized solution perfectly suited to your project.

You can choose between:

- All-in-one or modular hardware
- Flush or surface mount reader
- With or without touch buttons

- LAN or 4G connectivity
- MDB or proprietary protocol
- Custom fixings available

All-in-one terminal

Our latest all-in-one vending terminal is designed with the vending industry in mind. A compact contactless reader with colour display and 4G telemetry fitted onto an EVA mount, it offers MDB and proprietary HTTP MQTT-based command set.

Two-part design

The two-part system design – with separate reader and telemetry – allows convenient positioning of modules inside the POS enclosure.

Telemetry terminal

The telemetry terminal is a Linux platform that hosts business logic and interfaces with your POS. It offers connectivity options such as Ethernet and 4G cellular.

Contactless reader

The Yuzu contactless reader offers acceptance of Visa and Mastercard bank cards, as well as digital wallets. The reader comes with a choice of flush and surface mount casings.
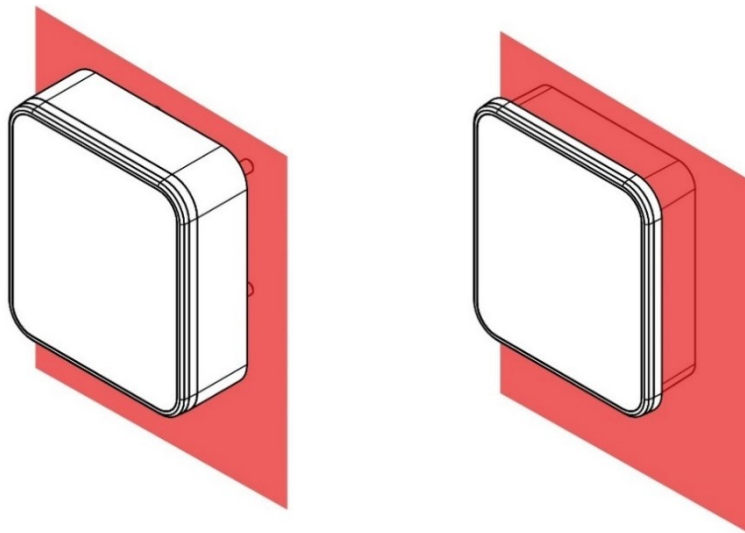
Optional touch screen buttons

Depending on your customer journey, you can choose the optional touch screen buttons.

Flush or surface mount reader installation

When ordering the reader separately, choose between the two installation options: flush or surface mount.
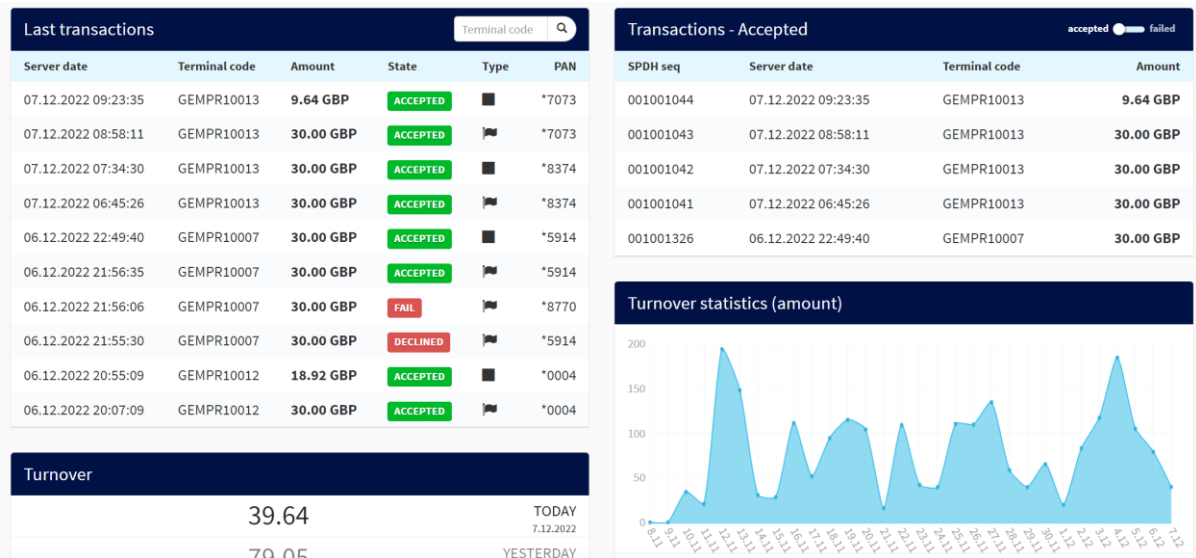

LAN with optional 4G connectivity

The terminal requires a live internet connection in order to process transactions. You can choose between Ethernet and a 4G connection.
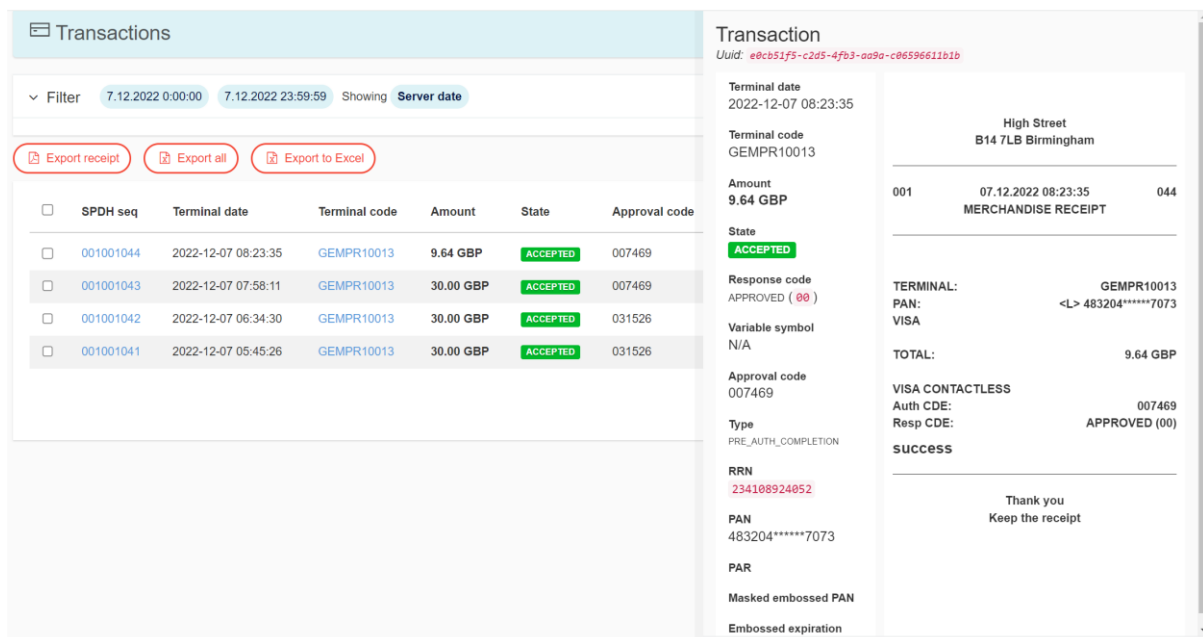
TRANSACTION PORTAL

Reporting

Merchants have 24/7 access to real time reporting via the Switchio platform. Log in to generate terminal sales reports at a click of a button.

View statistics or drill down into individual transactions and issue digital receipts. All transaction data is available within seconds of payment completion.

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 terminal	£199.00
4G module	£39.00

Ongoing fees	
Terminal management fee	£6.99 per terminal per month
Transaction fee	1.2% to 2% depending on volume

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 +44 (0)1202 666 700

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.

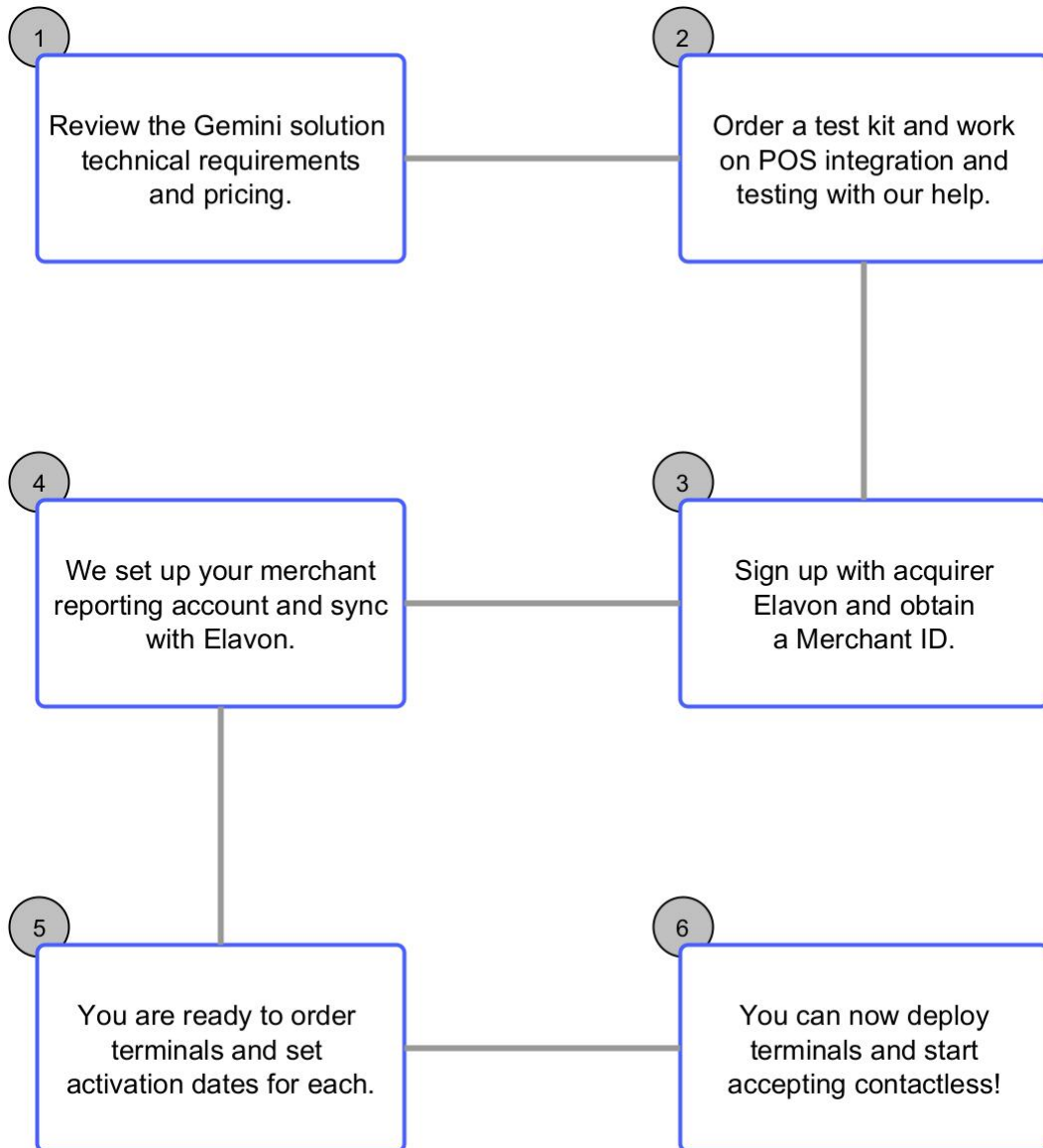► See *G2K Terminal – Technical Reference* https://www.gemini2k.com/mqtt

MDB

MDB (Multi-Drop Bus) is a communication protocol commonly used in vending machines for interfacing between the vending machine's controller and peripheral devices including payment terminals from Gemini 2000. Make sure you indicate your preference for MDB when placing an order.

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 loyalty and membership cards or transport schemes ITSO and Calypso, are executed separately by the telemetry terminal via the reader's Pass-through mode.

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:

1 Review the Gemini solution technical requirements and pricing.

2 Order a test kit and work on POS integration and testing with our help.

4 We set up your merchant reporting account and sync with Elavon.

3 Sign up with acquirer Elavon and obtain a Merchant ID.

5 You are ready to order terminals and set activation dates for each.

6 You can now deploy terminals and start accepting contactless!

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 2A.

☐ 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.

☐ MDB. Order a payment terminal compliant with your vending machine's MDB protocol.

☐ 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.

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 transmitted by reader is protected from malicious activity and attempts to read or modify it.

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 of 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 maybe 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.

APPENDICES

Reader specification

Physical specifications

Dimensions	65x75x28 mm (OEM module)
Weight Approx.	40g (OEM module)
Status Indicators	Beeper 4 LED indicators 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 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 *Discover and American Express to launch in 2024*
TQM Label

Application interface

Supported APIs	G2K API 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.
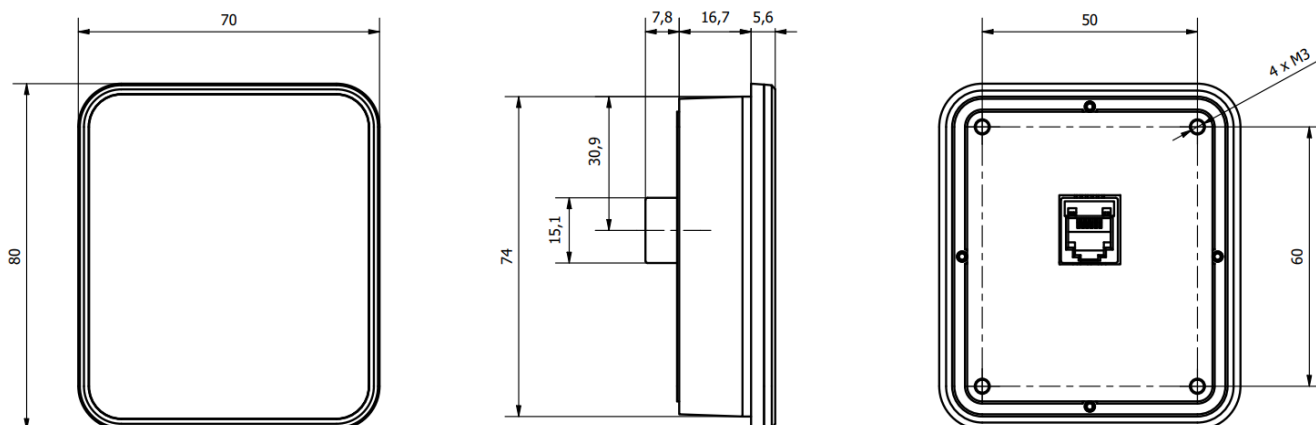
Raised mount – for surface installation.
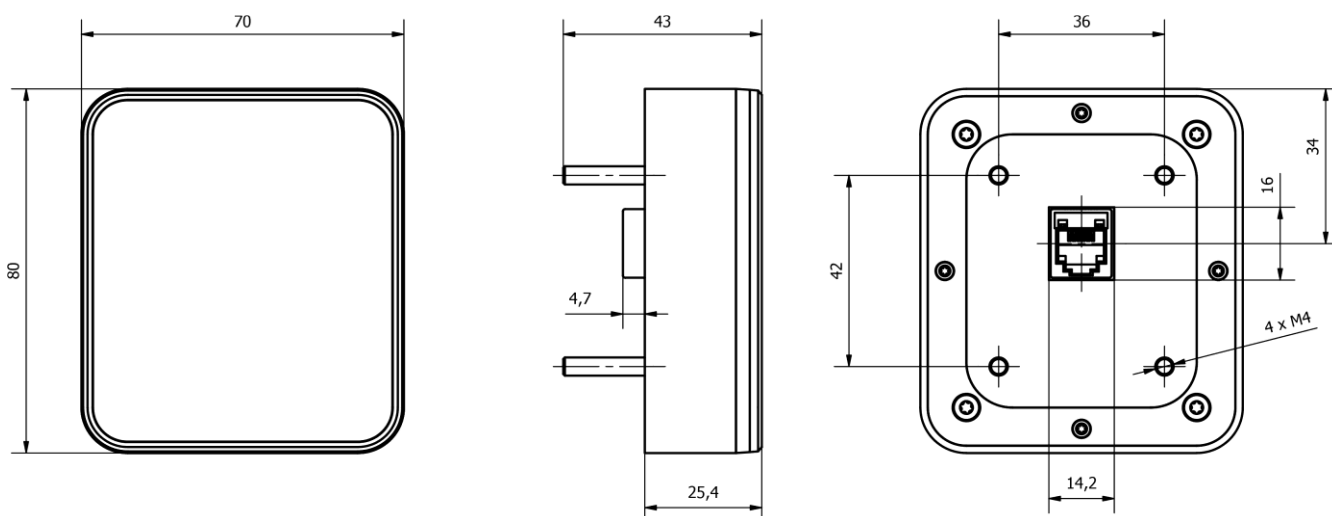
OEM module for installing inside your enclosure. This is possible when a 3mm thick non-metal front cover is used. EMV re-certification requirements may apply.

Telemetry terminal specification

Physical specifications

Dimensions	118x118x25mm
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.
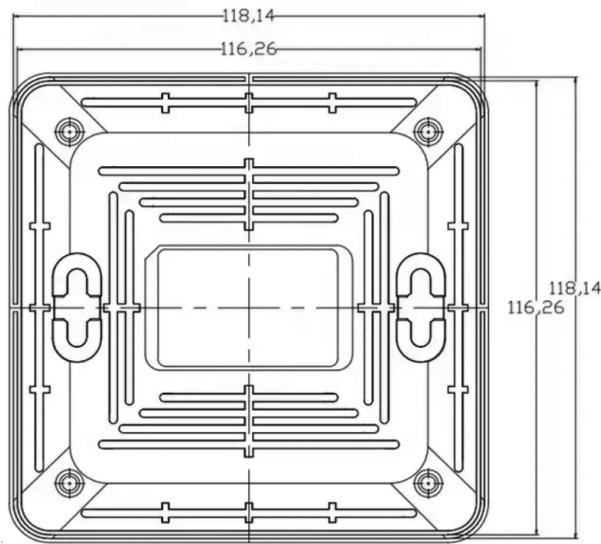
All-in-one vending terminal

Equipped with MDB and Pulse support and mounted to an EVA-standard frame, the Yuzu all-in-one terminal is designed for the vending industry.
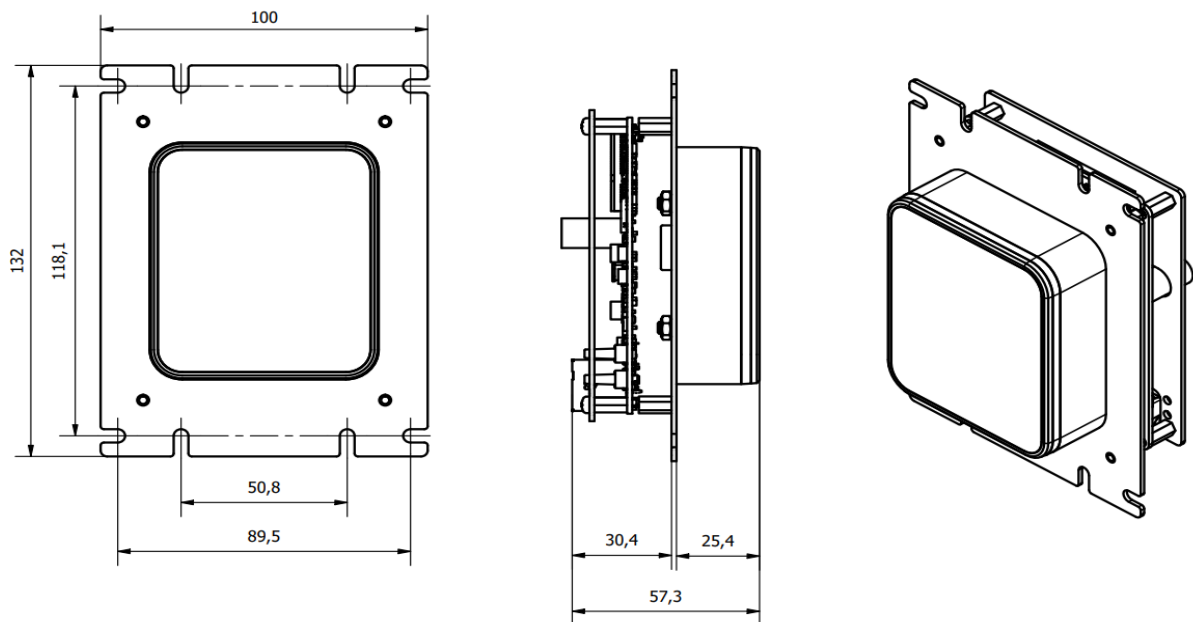
Certifications glossary

Level 1

Managed by EMVCo, this certificate is issued after testing the physical reader hardware, its radio capabilities and card communication. For example, tests are made with reference cards placed at pre-defined positions near the antenna. There are also analogue tests around the target frequency and digital tests on the low-level communication protocol.

Level 2

Tests around the payment application selection and financial transaction processing for each card brand such as Visa and Mastercard (each known as software "kernels".)

Level 3

Card brands are tested against the entire processing solution, from the reader to communications with the acquirer. Level 3 requires that the terminal is complete with its EMVCo approved hardware, software kernels, and payment application in place, and must be connected to a test environment.

PCI PTS

This is a security related certificate issued by the Payment Card Industry (PCI) Security Standards Council. It involves in-depth analysis of the reader security and attacks performed in a lab to find any vulnerabilities. PTS stands for PIN Transaction Security, which does apply to Crypto (a contactless-only reader with no PIN entry capability) through the programme's Secure Reading and Exchange of Data (SRED) module. Crypto has a secure version certified to PCI PTS SRED v5.1. Not all applications require PCI PTS. Get in touch to discuss the pros and cons.

Terminal Quality Management (TQM)

This programme was created by Mastercard to ensure that the functionality of contactless readers, as certified during type approval testing, can be sustained throughout the manufacturing cycle. Production processes are reviewed on-site at the factory to ensure good quality control and configuration management.