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

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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.

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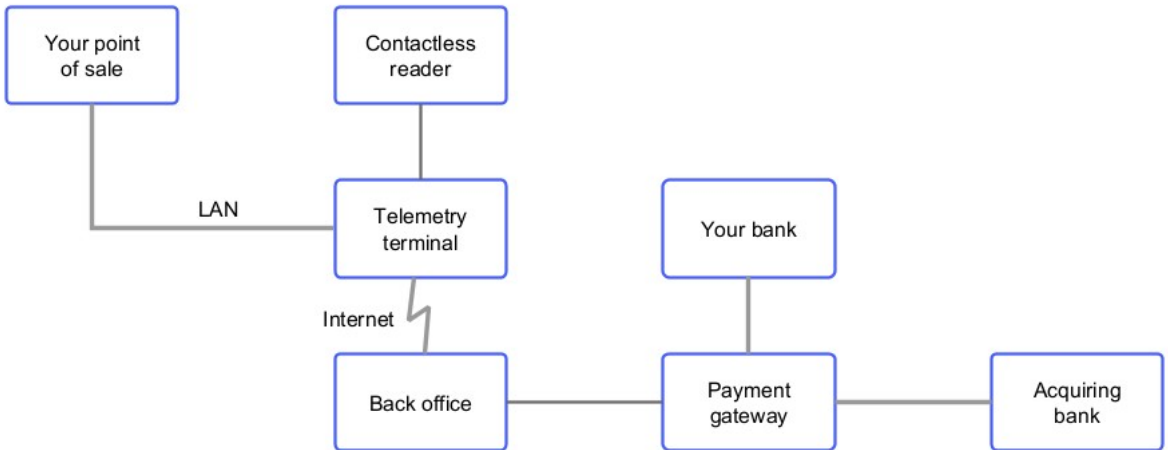
THE TRANSACTION JOURNEY

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.

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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

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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.

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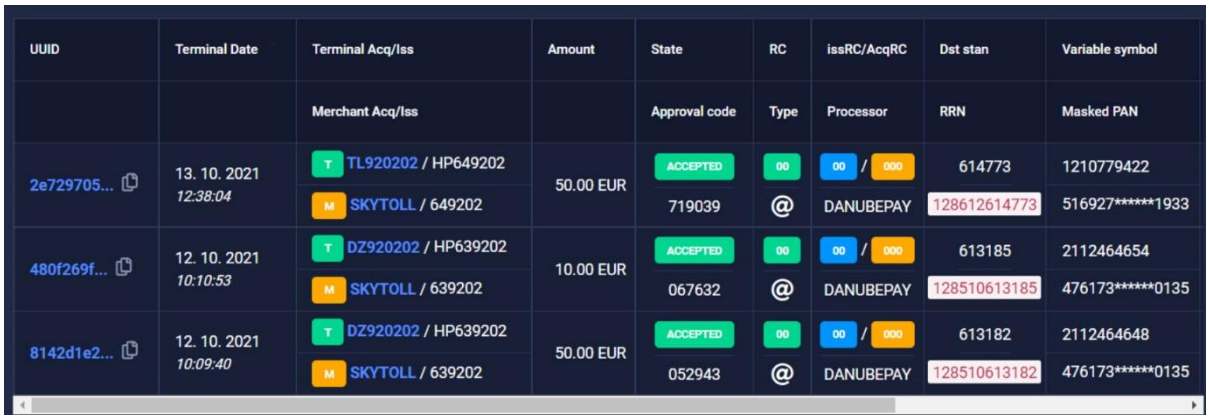
ONLINE PORTAL

Reporting

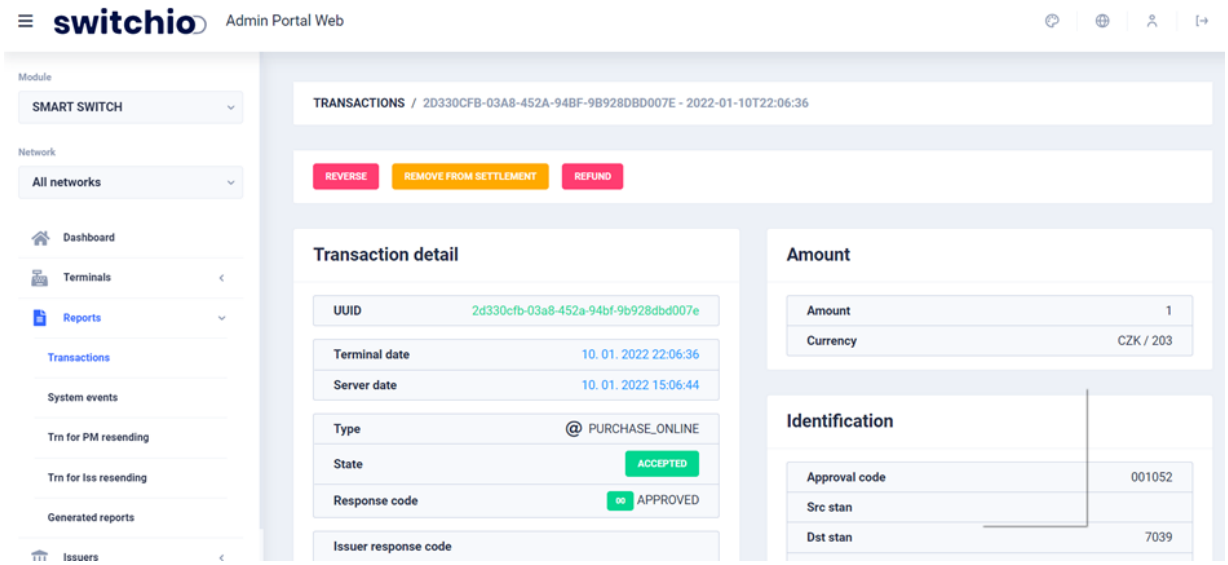
Merchants have 24/7 access to real time reporting via the Switchio platform. Log in to create sales reports and drill down into individual transactions.



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 12:38:04	T TL920202 / HP649202 M SKYTOLL / 649202	50.00 EUR	ACCEPTED 719039	00 @	00 / 000 DANUBEPAY	614773 128612614773	1210779422 516927******1933
480f269f...	12. 10. 2021 10:10:53	T DZ920202 / HP639202 M SKYTOLL / 639202	10.00 EUR	ACCEPTED 067632	00 @	00 / 000 DANUBEPAY	613185 128510613185	2112464654 476173******0135
8142d1e2...	12. 10. 2021 10:09:40	T DZ920202 / HP639202 M SKYTOLL / 639202	50.00 EUR	ACCEPTED 052943	00 @	00 / 000 DANUBEPAY	613182 128510613182	2112464648 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.



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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

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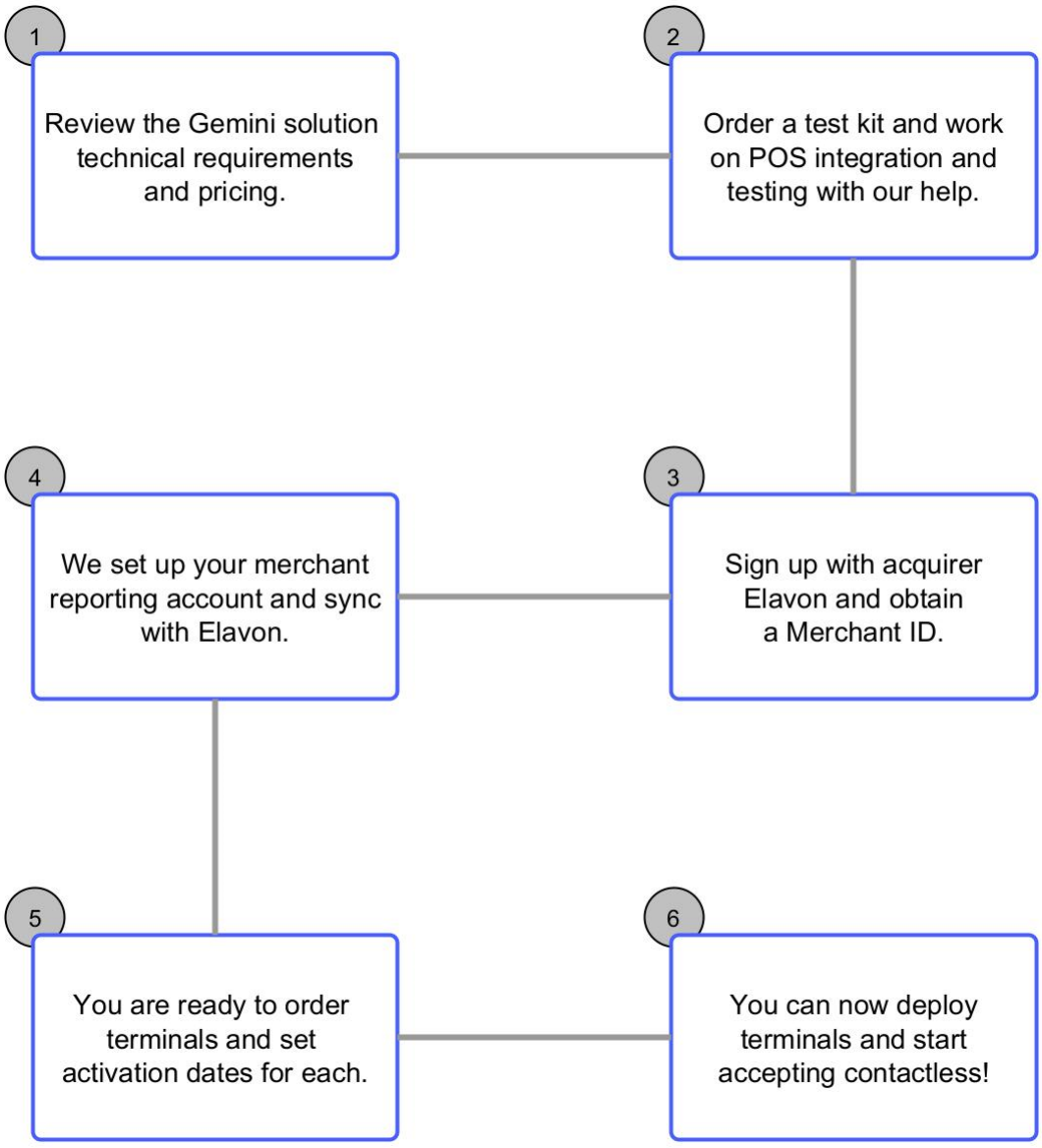
ROADMAP TO LAUNCH

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



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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.

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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

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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 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

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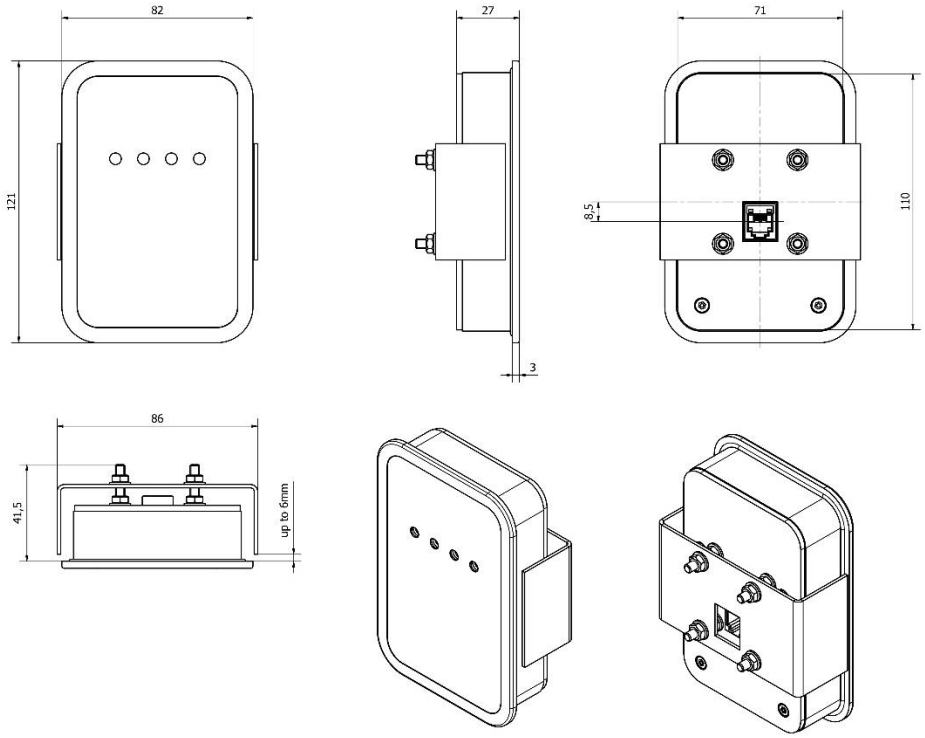
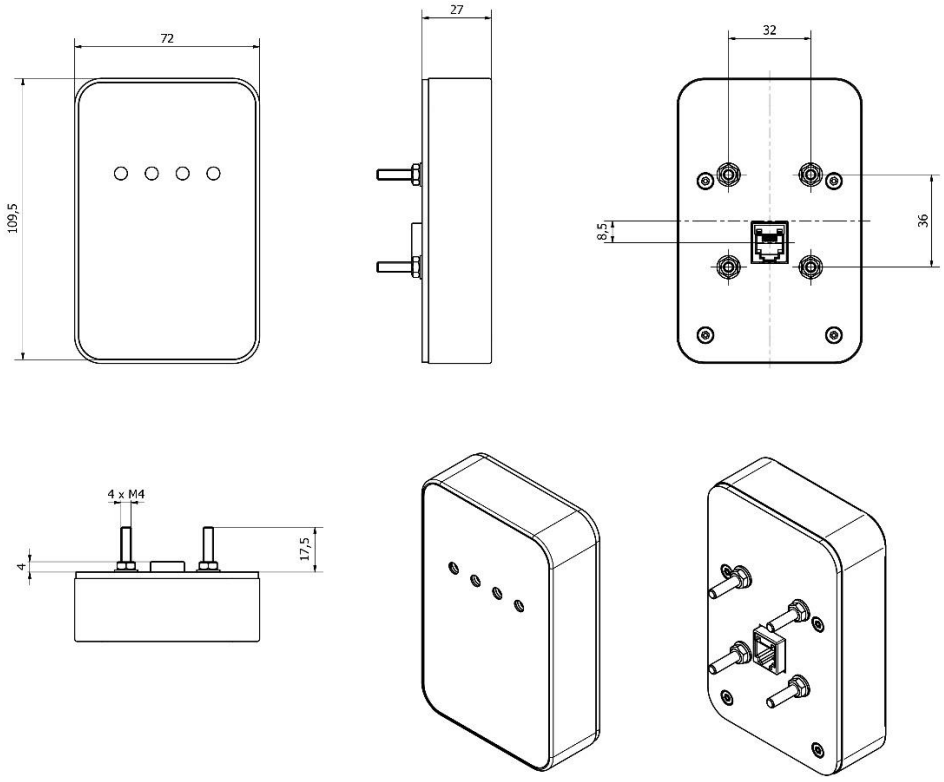
Reader casings

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



Raised mount – for surface installation.



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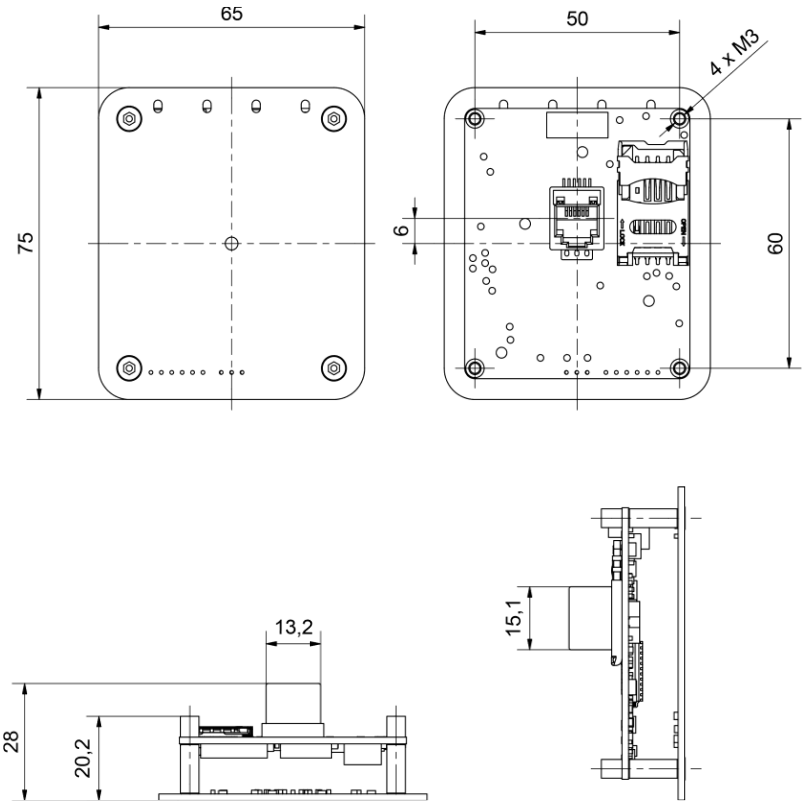
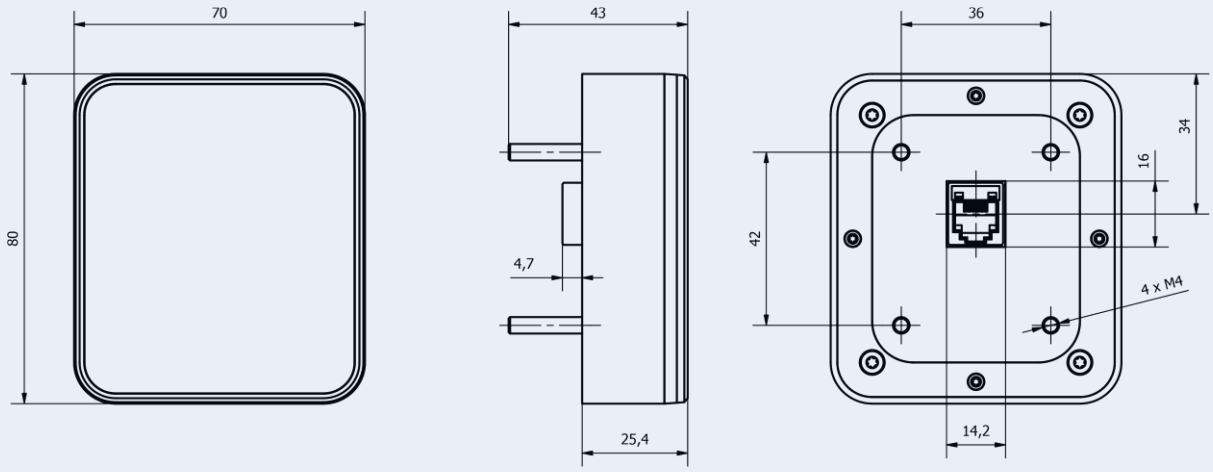
OEM module for installing inside your enclosure. This is possible when a 3mm thick non-metal front cover is used. EMV re-certification requirements may apply.



New! Compact reader coming out in Q4 2022.



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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

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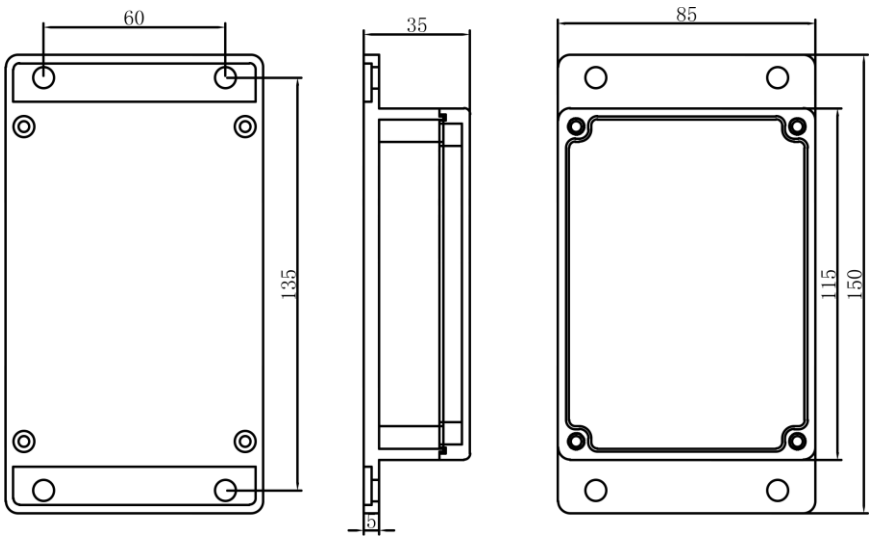
Telemetry terminal casing

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.



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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.

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