

# ST25R3916B/17B NFC READER



for payment terminals and  
NFC Forum compliant applications



## Upgraded wave-shaping, improved sensitivity and other unique features make it ideal for demanding NFC environments

Offering unique features, enhancing robustness, and increasing performance, the ST25R3916B/17B NFC/RFID HF readers are designed to operate in noisy environments without sacrificing design freedom.

Passing required certifications for EMV® contactless and NFC Forum is easier and faster than ever before. This allows minimizing the time required from the first concept until mass production of a product.

The ST25R3916B/17B build on the strong analog performance of their predecessor with upgraded easy to configure wave-shaping, extended dynamic power output and other unique features.

### KEY FEATURES & BENEFITS

- Enhanced noise suppression with very high receiver sensitivity for easier EMC certification
- Dynamic power output with active wave-shaping control on each power level for NFC Forum CR13 requirements
- Outstanding detection range at low power consumption
- Automatic antenna tuning to compensate for detuning in harsh environments
- Advanced diagnostics and NFC protection features:
  - Two test outputs for direct access to internal signals, digital or analog, for easy nonintrusive debugging
  - Unique technology distinguishes cards from phones

### KEY APPLICATIONS

- POS and mPOS terminals
- Physical access control
- Product configuration and authentication
- Traceability and user interaction with mobile devices
- MFI applications (upon request)

### Universal protocol support

The device embeds an advanced analog frontend (AFE) supporting:

- NFC-A and NFC-B (ISO14443A/B up to 848 Kbit/s)
- NFC-F (FeliCa™ up to 424 Kbit/s) reader functionality
- ISO 18092 passive and active modes for initiator and target devices
- NFC-V (ISO15693) reader
- NFC-A / NFC-F card emulation

### RFAL software library

To simplify application development, an implementation of the RF/NFC abstraction layer (RFAL) is available ([STSW-ST25RFAL002](#)). With a sophisticated software library including code for EMVCo and NFC card protection, it provides a common interface that makes the upper software layers independent from the ST25R device.

### Dynamic power output

Ensures the automatic adjustment of the output power according to de-tuning conditions caused by different antenna sizes and distance. It autonomously ensures that the transmitted power remains NFC Forum compliant and safe to prevent damaging tags.

### Active wave shaping

Helps to simplify compliance with the latest NFC Forum and EMVCo requirements for mandatory monotonicity tests and the required limits for signal over- and under-shoots. The active wave-shaping feature fits the signal within the required conditions using simple register settings supported by our advanced software development tools with a user-friendly GUI ([STSW-ST25R010](#)).

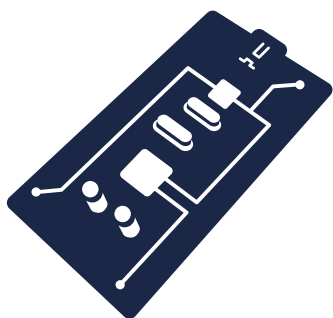
### Low-power card detection

Especially designed for battery-operated applications, this feature is based on the internal inductive wake-up circuit that helps ensure the lowest power consumption and is individually adjustable to maximize the detection range of a phone or a card.

### Robustness and sensitivity

The ST25R3916B/17B readers are a very robust and noise-tolerant solution thanks to very high receiver sensitivity able to suppress external noise sources such as LCD screens on payment terminals and to ensure performance stability even if noise is injected on the power supply lines. Moreover, it reduces electro-magnetic emissions, enabling an easier EMC certification.

## Reference design kits



### Discovery kit for ST25R3916B (STEVAL-25R3916B)

Ready-to-use kit lets developers evaluate the upgraded and easy-to-configure wave-shaping feature of the ST25R3916B/17B NFC reader front-end as well as the extended dynamic power output and other functions.

### NFC card reader expansion board (X-NUCLEO-NFC08A1)

Based on ST25R3916B/17B NFC reader front-end for STM32 and STM8 Nucleo platforms and compatible with STM32Cube development environment

### EMVCo certified development kit (ST25R3916B-EMVCO)

Reference design based on the ST25R3916B/17B NFC reader front-end representing the contactless part of a payment terminal including the example code for the EMVCo level 1 stack.

## Device summary

Part number	Mode	RF interface	Serial interface	Advanced features	Output power	Ambient Temp range	Package
ST25R3916B	R&W, P2P, CE	ISO14443A/B, ISO15693, FeliCa	SPI, I <sup>2</sup> C	AAT, DPO, AWS, NSR, IWU	1.6W	-40 to 105°C	QFN-32 (5x5mm)
ST25R3917B	R&W	ISO14443A/B, ISO15693, FeliCa	SPI, I <sup>2</sup> C	DPO, AWS, NSR, IWU	1.6W	-40 to 105°C	QFN-32 (5x5mm)

Note:

AAT: automatic antenna tuning; DPO: dynamic power output; AWS: active wave shaping; NSR: noise suppression receiver; IWU: inductive wake-up



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