VAL35–Compact AFC Validator
Datasheet, V2.14

*Fig 1: VAL35

*Product visuals are for information only and may vary on a case in tender specs

1. Introduction

VAL35is a validator for automatic fare collection (AFC) in public transport. It incorporates an **EMV Level 1 and Level 2certifiedcontactless (NFC)** card reader and a **QR scanner**, that provides unmatched flexibility in public transport ticketing.

VAL35is based on a **powerful processor and large memories**:

- CPU : ARM CortexA7 1.5GHz, triplecore
- RAM : 512MBytes RAM
- Flash Memory : 4GB eMMC Flash Memory(option – 8/16/32GB)
- Backup memory : Micro SD Flash Memory Slot
- RTC : real time clock withan integrated lithium battery
- UID : serial EEP (128 bytes) with unique serial number, integrated into the main board, allowsunique differentiation of each separate product
- ONEWIRE memory : identification chip with 128 bytes nonvolatile memory, attached to the external cable, allows automatic identification of the vehiclewhen validator is changed (optional)

VAL35**communicates** through:

- Ethernet : 100 MB/s
- Serial interfaces : 2 x UART RS-232
- WiFi& BT : 802.11bgnac& BT4.2 (optional)
- Cellular : CAT1LTE/EDGE/GPRS modem
- USB : 1 x USB2.0 Host+ 1 x USB2.0 OTG
- Data security : 2 slots for SAM (secure access module support)

VAL35offers the following **user interface** capabilities:

- Display : 3.5”,640x480, 24-bits color LCD withLED backlight
- LED : 4 x high brightness RGB LED
- Audio output : Speaker, 5W
- Keyboard : Multi-touch capacitive touch panel
- RFID and NFC reader : DER20 - separateEMV Level 1 and Level 2 (MC, VISA, DISCOVER, RuPay) certifiedreader, integrated within the validator
- QR code scanner : Reads barcodes and QR codes, including those on smart phones.

VAL35incorporates the following **sensors:**

- GNSS (GPS+GLONASS) receiver
- Ambient Light Sensor
- Input Voltage and Current Sensor

VAL35has the following **input/output** capabilities:

- 1 x optically isolated digital input
- 1 input from the ignition switch of the vehicle
- 2x digital outputs, high side, overcurrent protected at 200 mA

VAL35incorporates a**separateEMV Level 1and Level 2 (Mastercard, Visa, Discover, Rupay) certifiedcontactless card reader – DER20,** fully **compliant** with the relevant ISO standards - ISO/IEC 14443A/B.

Besides the contactless card reader, VAL35 is capable of reading with good performance even under bad light conditions all kinds of **QR codes** and barcodes on a paper or on a smart phone, either.

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The AFC software suite runs under a high level OS – **Linux**, with special arrangements and **measures for unattended use**. Well documented **development environment and SDK** with reliable software libraries and modules are offered, allowing implementation of own software by the integrator companies. Training is also provided upon request. SDK is based on the object oriented language (C++) and the widely used Graphical User Interface (GUI) Qt.

VAL35operates**reliably in the harsh electromagnetic and mechanical environments, essential to the automotive**.

- Special precautions have been taken to prevent the negative effects of vibrations. All **connectors are automotive type**, i.e. with a latch, preventing undesired accidental disconnections.
- Special attention is paid to the **wide temperature range**in public transport vehicles – automotive grade components have been chosen;
- The power supply blocks are based on highly efficient**DC-DC converters**that reduce dissipated heat energy.

VAL35 contains a high-speed, deterministic **microcontroller** system and ignition control MCU that takes care of all high-speed hardware events that could not otherwise be brought under control via the main application CPU.Because uninterrupted functionality is crucial to AFC systems, great emphasis is placed on early self-diagnosis and remote monitoring capabilities.In case of suspected malfunction (parameters out of range, signaling a possible future problem), the VAL35 generates two levels of alarm, warning and critical.All such events are logged in the local database and in the central control office, respectively.

The following **protections** are provided:

- Reverse polarization of the input supply
- Overvoltage of the input supply
- Overcurrent
- Transient voltage suppression
- ESD protection on all connectors for all signals
- Overheating