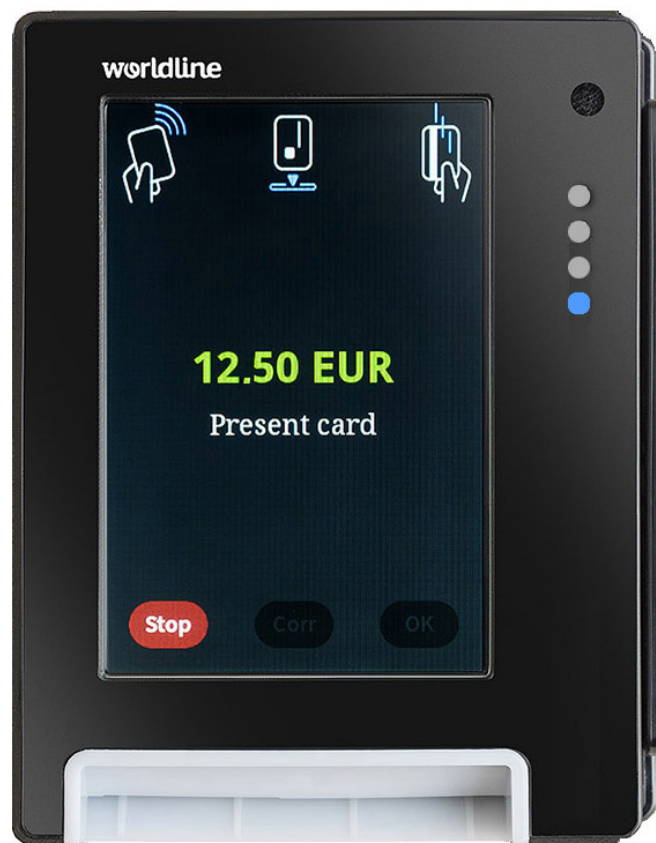


**VALINA**

**the next generation**

**compact, convenient, complete**



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## About this book

This book provides product information about:

- the VALINA terminal and its accessories
- technical specifications
- security considerations
- approvals and certifications, including applicable environmental regulations
- VALINA parts list

### Who should use this book

- anyone who will be installing a VALINA in a vending machine or other equipment
- field and service technicians working on a VALINA terminal

Information from this book may be reused in other documentation such as a user guide.

### What is new in this version

Version 1.2.1 has been updated to give correct information about USB connectors, plus additional information about:

- power management: see Power management for VALINA, on page 12
- flow control: see External interfaces, on page 6

Changes/updates in this version are highlighted in green and with a change bar. Significant deletions are struck through in grey.

## Change log

### document release 1.1

updated to show power consumption figures for hardware revision AC of the VALINA terminal; see Power consumption, on page 10.





## Introduction

The VALINA is an intelligent all-in-one terminal for unattended payments with and without PIN, supporting a range of standards including EMV and Mifare. It handles payments by chip card, NFC cards and devices, and magstripe card.

The VALINA has been designed to provide a complete solution for EMV payments, and can run either newly-developed Android apps or legacy apps (written for the MAPS platform) from Worldline. It is PCI certified, SRED included.



For up-to-date information on certifications, see the VALINA page on the website [terminals.worldline.com](https://terminals.worldline.com)

Key hardware features include:

- 3.5" touch TFT colour display for an enjoyable payment experience
- small footprint matches EVA/CVS 1.3 standards for Standard Door Module (SDM) dimensions, making integration in vending machines easy

The VALINA takes up minimal space inside the machine: compare this with the footprint of a bank note acceptor (BNA) or coin detector.

- onboard Ethernet, serial interface, MDB, USB host and USB device meet most communications requirements out-of-the-box
- patented proximity detector (from rev. AC) for improved power management

Typical integration scenarios for the VALINA include:

- vending machines, ticket machines and kiosks
- petrol forecourts and car-washes
- on-street and off-street parking
- dispensers and pre-payment meters
- self-service checkouts

## Security recommendations

For security reasons, merchants are advised to check their VALINA regularly to make sure that:

- there is no visible damage to the housing
- no camera has been set up to track cardholder activity
- no skimming device or unusual cable has been attached
- no foreign object is present in either of the card-reader

## Display

The VALINA incorporates a touch-sensitive TFT 64K colour display. The display size is 320 × 480 pixels, 3.5 inches.

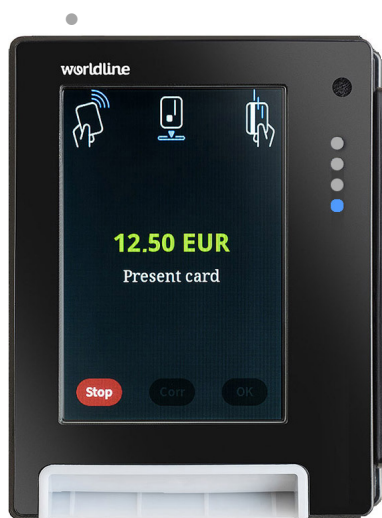


Figure 1. VALINA

## Technical specifications

This chapter provides a summary of the technical specifications, followed by additional information on:

- external interfaces
- processor
- customisation options

### Size and weight

The VALINA complies with EVA/CVS 1.3 standards for Standard Door Module (SDM) dimensions.



For exact measurements, including tolerances, download drawing 3034910003 from the Partner Extranet.

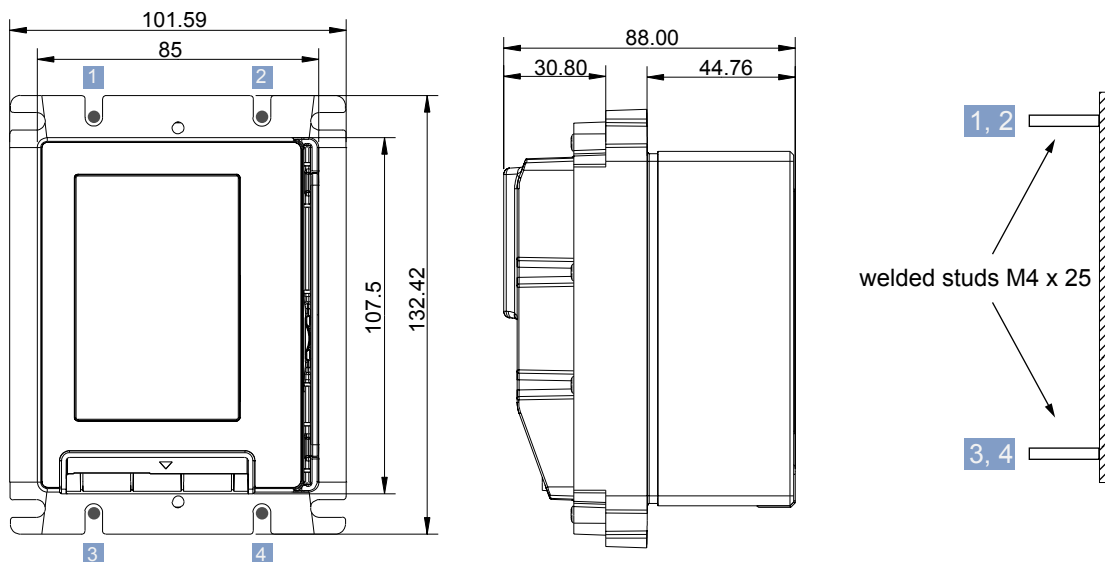


Figure 2. General dimensions

- size: 132.42 × 101.59 × 88.00 mm (height x width x depth)
- weight: 573g
- the VALINA is fixed in place using four M4 studs that fit in the cut-outs marked 1 to 4

### Power supply

Either of

- 12 VDC via Microfit or RS232
- 24-45 VDC via MDB

Different power management profiles can be used.

## External interfaces

There are six sockets available for connecting the VALINA to external peripherals. The picture shows the sockets in the connector area at the back of the VALINA.

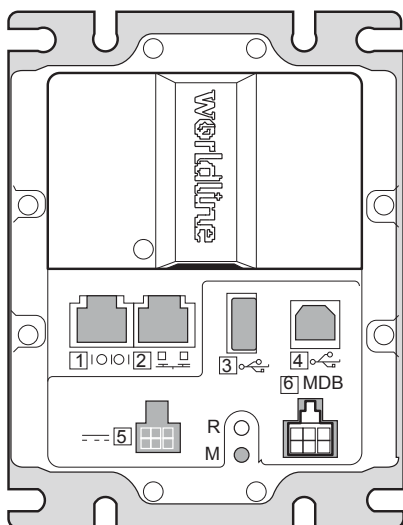


Figure 3. Indicators, connectors and controls

### 1 RS-232

RS-232 port with RTS/CTS flow-control, for connecting peripherals such as ePOS equipment or a printer. The port allows connection speeds up to 115,200 bps and is fitted with an RJ45 connector. The RS-232 port can also be used to provide a power supply.



Hardware flow control (RTC/CTS) is not supported for releases AA, AB and AC. Flow control for these releases needs to be handled by software.



### 2 Ethernet

Ethernet connection 10/100 Mbit, using an RJ45 connector.



### 3 USB host

USB 2.0 high speed (up to 480 MBit/sec) host interface, which can be used to connect to a USB stick or other storage device.



### 4 USB device

USB 2.0 high speed (up to 480 MBit/sec) device interface, which can be used to connect to ePOS equipment/PC and to perform key loading.



### 5 TTL

TTL connector Microfit 43045 has one output and up to three inputs, and is used to attach a peripheral to the terminal.

The TTL port can also be used to provide a power supply.

## 6 MDB

MDB interface supports the MDB 4.2 protocol, for communicating with vending machines or other devices supporting the standard.

The MDB port can also be used to provide a power supply.

### Reset button

The reset button is used to reset the terminal without unplugging the power. For application developers, it provides an easy way of rebooting the terminal. The reset button is slightly recessed to prevent accidental use.



### Menu button

The menu button can be used to activate a menu on the terminal, for example to check settings.

## Network considerations

Worldline supports two options for connecting a VALINA to the outside world:

- integrated comms card supporting mobile broadband (GPRS, EDGE, 3G, 4G)
- onboard Ethernet interface supporting landline broadband

Worldline will advise on and provide support for the parameterisation of both options, to meet the best level of quality when it comes to teleloading.

Because Spica packages for the VALINA are significantly larger than their older SAMOA equivalents, broadband throughput and latency become more critical. Teleloading has specific requirements, including a minimum transfer-rate of 4kbps over 30 seconds. Acceptable transfer-rates and latency are easier to obtain using landlines.

Please note that:

- Worldline cannot influence/take responsibility for the quality of any broadband solution
- Worldline will not support (or parameterise) hybrid solutions such as the use of mobile broadband routers/modems behind the Ethernet interface because there is too much dependency on the quality provided by the mobile operator, often impacted by deep indoor signal reception issues or the Faraday-cage impact of the machine.

## Reading cards and devices

The VALINA contactless reader is ergonomically designed and supports fast, fully secure payments with both contact and contactless cards and devices of all signalling schemes defined in the ISO14443 standard.

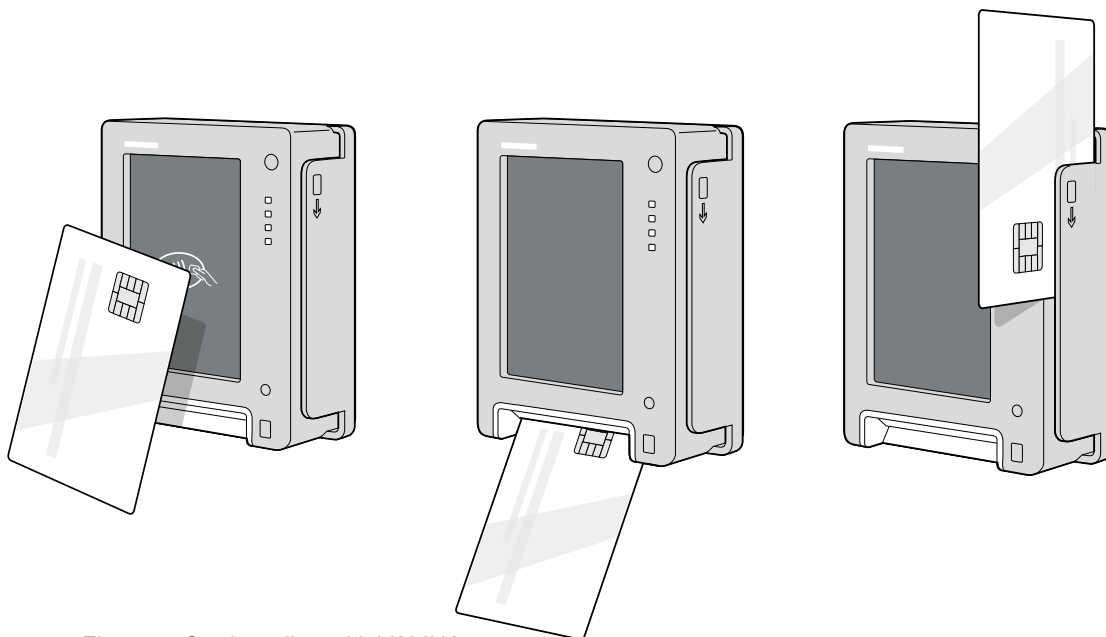


Figure 4. Card reading with VALINA

### contactless cards/devices

The landing zone for contactless payment is:

- easily recognisable and accessible
- marked by the contactless symbol



The contactless symbol is placed where the signal is strongest, and shows the “landing zone” where customers should tap the card or device

### chip (contact) cards

- the chip-card reader is at the bottom of the terminal, 45° from the vertical
- the slot is illuminated to show the user where to insert the card

### magstripe cards

- the magstripe-card reader is on the right-hand side of the terminal
- cards are swiped from the top of the slot to the bottom, as indicated on the housing

## Operating the contactless reader

VALINA is designed for use with both contact and contactless cards/devices. Contactless cards/devices may be tapped on the front of the terminal. The terminal can communicate with cards up to 40mm from the reader, in line with the EMV standard.

Other characteristics include:

- contactless communication in 13.56MHz band
- contactless communication up to 424kbit/s
- ISO/IEC 14443A
- ISO/IEC 14443B
- MIFARE classic/desfire compatible

- ISO/IEC 18092 NFCIP-1
- integrated LEDs indicate transaction progress and availability of NFC

The VALINA offers card holders the real “tap & go” experience. Thanks to the powerful antenna in the terminal, the contactless device only has to be held near the landing zone.

## Software engines for contactless transactions

The Mastercard PayPass and the Visa payWave engines are available. Other engines can be provided on customer request. Specific contactless applications are developed locally, since they deal with communications between terminal and host.

## Security Application Modules (SAM)

VALINA contains two internal chip card interfaces (type ID0) for security application modules (SAM). Both 3V and 5V SAMs can be read. Standard current provided to the SAMs is 55 mA.

To reach the SAM slots, the telecom cover needs to be opened using a T8 Torx screwdriver.



There is an installation movie available from the VALINA page on the [Partner Extranet](#).

## System on chip ASIC

The processor for the new generation of terminals from Worldline is a high-tech Application Specific Integrated Circuit (ASIC). For the VALINA, this single chip provides all essential features, including:

- ARM Cortex A9 main processor (600 MHz)
  - security / communication core
  - application / communication core
- 1 Gb RAM memory
- 4 Gb memory
- real-time clock (RTC)
- hardware DES / 3-DES encryption device
- Linux and Android operating systems
- MAPS platform for applications

## Audio

VALINA is equipped with a speaker for audible feedback to the user. It can be used to play:

- music (supported formats include mp3 and wav)
- voice output, for example as assistance for the blind and partially-sighted
- simple beep tones

## Other features

### **security 3DES, AES and RSA encryption algorithms**

DUKPT key management (other schemes available on request)

TLS (additional security schemes available)

### **software**

Linux and Android operating systems

Linux-based development kit (C and Java)

secure remote download of software

### **hardware integration options**

hardware integration kit

key-loading interface

### **communications and peripherals**

standard Ethernet interface

1 x RS232

1 x USB device

1 x USB host

1 x MDB interface

1 x I/O (1 out, 3 in)

comms board interface

microSD card slot

### **proximity sensor**

This sensor can be used to trigger a wake-up signal to the terminal whenever the terminal is in sleep mode.

## Power consumption

Power consumption depends on a range of factors. Worldline terminals support power management profiles, which applications can use to influence power consumption. Measurements provided by Worldline as a terminal manufacturer are purely indicative, and based on the default power management settings described below.

### **Stand-by**

backlight off, most terminal components inactive and waiting for a trigger to go in ready mode

### **Ready**

backlight dimmed, all components active, terminal ready to accept payment

### **Transaction**

backlight fully active, terminal exchanging data with host

Power measurements in this mode represent the average power consumption



during a transaction. Peak values may occur for certain payment types.

<i>Power consumption (watts) for VALINA</i>	
	no accessories*
mode 'stand-by'	0.019
mode 'ready'	1.79
mode 'transaction', with ship card	2.67
mode 'transaction', with magstripe card	2.63
mode 'transaction', with NFC card / device	3.10
	* Ethernet enabled

### Power management for VALINA

VALINA is equipped with smart power management profiles. Each profile puts the terminal in a different state, and supports different ways to wake up the terminal. Using the different profiles in a smart way will minimise the amount of energy the VALINA requires when not in use for a transaction. The information below is indicative. Measurements in the field may differ, depending on applications that might call for additional resources.

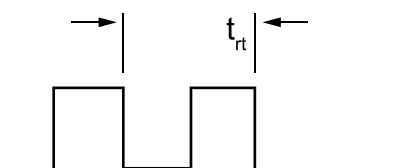
#### **stand-by profile**

consumption:

– 0.019W

wake-up possibilities:

- external trigger via the TTL I/O interface
- reset button on the back (not accessible by cardholder)
- double pulse via the TTL I/O interface



$t_{rt} < 300ms$

Figure 5. Double-pulse timing for wake-up

wake up time: 65s to make the terminal available in a ready for transaction state

#### **sleep profile**

consumption:

– 0.104W

wake-up possibilities:

- alarm generated by the Real Time Clock (RTC)
- insertion of a card
- proximity sensor detecting someone approaching the machine
- input on TTL I/O (same as stand-by mode)
- Reset button on the back (not accessible by cardholder)
- data on the serial interface (RS232)

wake up time: 1s to make the terminal available in 'ready' state

***transaction profile***

consumption: 2.4W during the transaction

## Accessories

A number of optional accessories are available, to make the VALINA easier to use and integrate:

### **debug cable and connector**

To facilitate software development, a debug cable and connector is available. (delivered as standard with a VALINA development terminal) The cable connects to the internal electronics of the terminal, making it possible to develop and validate a payment application on a PC before transferring it to the terminal.

### **power adaptor**

plug-in adaptor (Microfit) 12 VDC, 2A



# Development environment

Developing custom applications for the VALINA is supported by a development terminal and a complete software development kit (SDK).

## **SDK**

The VALINA platform includes a professional, full-featured, Linux-based application development environment supporting both C and Java. An SDK for Android will be made available in phase 2.

## **development frameworks**

- backward-compatibility environment (MAPS), making it easy to port existing applications to VALINA
- application programming environment, for developing new applications that exploit the full functionality of VALINA

## **comprehensive set of development tools**

C and Java development tools for MAPS applications

## **comprehensive documentation**

- description of the MAPS Application Programming Interfaces (API) for C and Java
- introduction to the System-on-Chip hardware, software and security architecture
- interface design guidelines
- application development and porting guidelines



## Logistics information

This chapter provides:

- samples of labels for the VALINA terminal, accessories and packaging
- information on product packaging

### Terminal label

Examples of product labels are provided to show what information is given on each label.

Minor differences in layout may occur.



Figure 6. Terminal label

The VALINA terminal label shows:

- maker's name: Worldline SA/NV
- model name: VALINA
- article number, referring to the specific terminal hardware

This number identifies the specific terminal hardware and customisations, and is used for certification purposes. It is not the same as the commercial article number mentioned on the packaging box, which is customer-specific.



- serial number:
  - human-readable, for example Serial N°: ABC1234
  - barcode
- production date in the format yywk, so 1549 for week 49 in 2015
- country of origin: Made in Indonesia
- voltage and current: 12V 2 A
- safety labels, for example CE, FCC
- WEEE-logo

## MAC address label

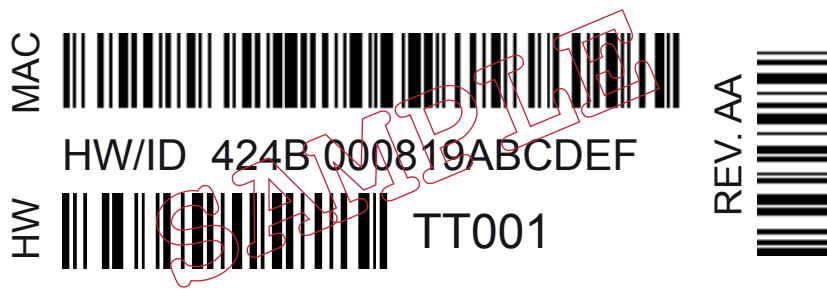


Figure 7. MAC address label

The MAC address label contains communications and software informations.

- MAC address, which can be
  - read from the barcode
  - consulted via software
- HW/ID (hardware ID) made up from a four-character prefix – 424B in the example
  - followed by the hexadecimal MAC address – 000819ABCDEF in the example the full HW/ID is not provided as a single barcode
- HW (production) code, for example TT001
  - this information can also be read from the barcode
- REV (hardware revision code)



## Packaging

All packages are designed to be as small as possible, and to make it easy to check that all components are present.

In addition to the terminal, mains adaptor/USB adaptor, cable(s), fixation plate, documentation set and other accessories may be added at the distributor's site



The multiple-item packages contain terminals ONLY. When needed, fixation plate, power supply and cables should be ordered separately. Please refer to the order list for ordering quantities.

Table 1 Product packaging - single items		
equipment	w*l*h mm	weight g
VALINA	156*235*105	1011

Table 2 Product packaging - multiple items			
equipment	per pack	w*l*h mm	weight g
VALINA	9	385*460*115	6.1

## Palleting

The palleting information is for a europallet with a pile-up height between 1600 and 1800 mm.

Table 3 Palleting - individually-packed equipment			
equipment	per pallet	weight* kg	notes
VALINA	325	351	13 layers
option	375	402	15 layers
option	300	326	for air freight: 12 layers
<i>*weight includes europallet, foil, shipment papers and straps</i>			

Table 4 Palleting - multiple packs			
equipment	per pallet	weight* kg	notes
VALINA	360 (10 × 4 × 9)	268	
<i>*weight includes europallet, foil, shipment papers and straps</i>			

## VALINA spare parts

All VALINA spare parts are supplied in bulk packaging. They cannot be ordered individually. See order list for details.

## approvals

The VALINA has been designed and manufactured with care for our environment.

It complies with relevant European directives both at manufacture and at end of life:

- European directive 2011/65/EU on Restriction of Hazardous Substances (RoHS2) as amended by 2017/2102/EU, intended to reduce harmful substances such as lead, mercury and cadmium at source
- European directive 1907/2006/EU on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), intended to ensure chemicals are produced and used in ways that lead to the minimisation of significant adverse effects on human health and the environment
- European directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), encouraging collection, treatment, recycling and recovery of such items
- The VALINA is labelled with the WEEE-logo (crossed-out wheeled bin)



## Certifications



For up-to-date information on certifications, see the website [terminals.worldline.com](https://terminals.worldline.com)

The VALINA has been approved/certified in line with international standards including:

- EMV Level 1 for all chip-card interfaces
- EMV Level 2 approved kernel for payment application development
- PCI PTS
- EU directive 2014/53/EU (RED – radio equipment directive)

The VALINA complies with the LVD and EMC directives.

- EU directive 2014/35/EU (LVD – low voltage directive)
- EU directive 2014/30/EU (electromagnetic compatibility (EMC) directive)

These lists are not exhaustive.

## FCC 47 part 15

The equipment has been tested and found compliant to the requirements of the FCC 47 part 15 for digital devices.

## IC ICES-003 and RSS-210

This class B equipment has been tested and found compliant to Canadian ICES-003 and RSS-210 for digital devices.

Cet équipement de classe B a été testé et est conforme aux normes NMB-003 et RSS-210 du Canada

## FCC rules: 15.105

NOTICE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## FCC rules: 15.19

NOTICE: This device complies with Part 15 of the FCC Rules and with RSS-210 and ICES- 003 of Industry Canada.

Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## FCC rules: 15.21

NOTICE: Changes or modifications made to this equipment not expressly approved by Worldline s.a./n.v. may void the FCC authorization to operate this equipment.

**Radio frequency radiation exposure information:**

*This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator and your body.*

*This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.*

## Approvals related to use in a railway/tramway environment

**note** This section only mentions approvals that apply to the VALINA.

### Vibrations

Equipment used in a railway/tramway environments must be able to resist vibrations in the vehicles where it is installed, as measured by IEC standard 60068.

#### **EN 50155**

Railway applications. Rolling stock. Electronic equipment

#### **EN 50125-1**

Railway applications. Environmental conditions for equipment. Rolling stock and on-board equipment

### Electromagnetic interference

Included in EU directive 2014/53/EU (RED – radio equipment directive)

### Lightning-strikes

The equipment is protected against direct or indirect impacts of lightning-strikes by appropriate internal and external adapters.

#### **IEC 1312-1**

Protection against lightning electromagnetic impulse - part 1: general principles

### Fire and smoke

#### **EN 45545-2**

Fire testing of materials and components for trains.

