FS Reader

User & Service manual

PRIVA

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FS Reader

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About this manual

Aim and scope

This manual concerns the FS Reader, a handheld device for registration of labour for the horticulture industry.

This manual contains all of the information required to safely and correctly transport, install, commission and maintain the handheld device for registration of labour. This manual will also allow you to effectively observe and resolve any malfunctions.

For the sake of simplicity this manual uses the term "unit", to refer to "handheld device for registration of labour".

Availability of the manual

This manual is intended for end-users of the FS Reader.

Make sure that for employees who operate and monitor the unit, this manual and any other relevant manuals (such as the software manual of the registration system) are made available at the workplace.

Symbols in this manual

	Danger. Instruction to prevent physical injury, damage to health, or damage to the environment
	Note. Instruction to prevent problems or material damage
	Additional information or explanation
	Tip

Terms and abbreviations

The list below states the abbreviations and terms relating to the Priva labour and production registration units of FS Performance. Therefore, abbreviations and terms that do not apply to your specific unit and as a result are not used in this manual may still be found in the list below.

Abbreviation / term	Explanation
FS Reader	handheld device for registration of labour
FS Cradle	storage/charger for the handheld device for registration of labour
FS Tag	electronic label for the labour registration system
FS Concentrator	Wireless access point for the labour registration system
FS Router	Wireless repeater for the labour registration system
FS Reader Software	Supporting software for handheld devices for registration of labour

Safety

No special safety tips apply to the usage of this product.

Product description

The FS Reader is a handheld device that is used for the registration of labour, as a part of the labour and production registration system of Priva FS Performance.

Functions and intended use

The FS Reader is a device used for registrations done both in the greenhouse and pack-house.

- It is a portable device that is carried with the greenhouse employee.
- In can also be used as a stationary registration device in the pack house. It is then mounted or placed in a central place. Multiple employees use the same device.

Most registrations are done through an RFID tag. Tags are used to register the employee, activity, location and cart or container.

The FS Reader automatically transmits registration data when a wireless coverage is available.

Installation

Labour managers are allowed to take the FS Reader into operation.

The FS Reader is packaged at production almost ready for use; the remaining steps to make the FS Reader operational are:

1. First, register the FS Reader in the FS Reader software[1]; use the serial number of the FS Reader that is printed on the sticker at the back side of the FS Reader.
2. Then, place the FS Reader in the FS Cradle, which triggers the FS Reader to:
    a) Awake from its 'transport mode'.
    b) Pick up wireless communication that can be understood; this allows the FS Reader to switch to the correct frequency that is used for the wireless communication.
    c) Switch to the 'Linked' status.
    d) Synchronise the internal clock.
    e) The latest firmware version will be loaded if this is different from the pre-loaded firmware version in the FS Reader.

    The FS Reader reports information about its status regularly to the server; this can be inspected by means of the FS Reader Software.
3. Finally, leave the FS Reader in the FS Cradle to get its battery fully charged. The led on the FS Reader turns blue when the battery is fully charged.

Troubleshooting

In case of problems, a message will be generated. This manual describes the problems you might be able to resolve yourself.

[1] For further instructions, please refer to the "FS Reader Software - User Manual".

Operating software

The functionality of the FS Reader is in its firmware.

The FS Reader is delivered with the most recent version of this firmware that was available at the moment of production.

A new version of this FS Reader firmware can be loaded into the FS Reader over the wireless network. Please refer to the “FS Reader Software – User Manual” for more information.

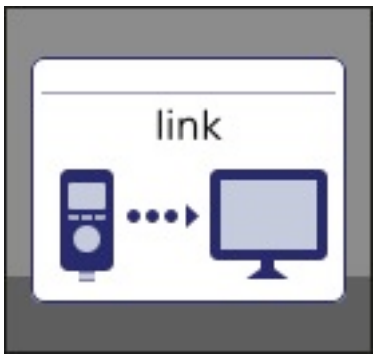
Operation

FS Reader User Interface methods

The FS Reader has the following ways to interact with the user:

- The display shows the user information.
- Soft key A, B and C: the left, middle and right soft keys are used to activate functions in the display menu.
- Soft key D: the scan button is used to scan the RFID tag.
- Led: in the upper right corner just above the display.
- Buzzer: makes a sound to attract the attention of the user.
- Vibration motor: makes the FS Reader vibrate to give the user extra feedback.

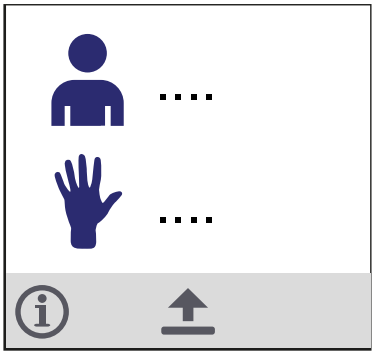
Commissioning: link FS Reader to the customer system



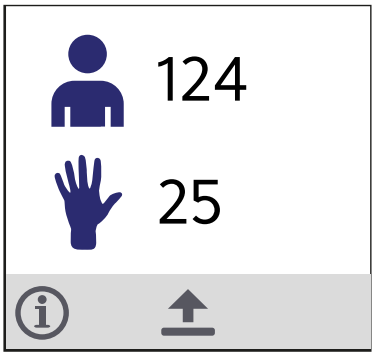
This screen indicates that the FS Reader has not been registered yet or has been ‘unlinked’ since. The FS Reader cannot scan at that time.

Please refer to the ‘FS Reader Software User Manual’ how to register or link the FS Reader to the customer system.

Please be aware that the FS Reader needs to communicate through the wireless network with the Server in order to be able to receive the ‘Link’ status message and to synchronize the internal clock.

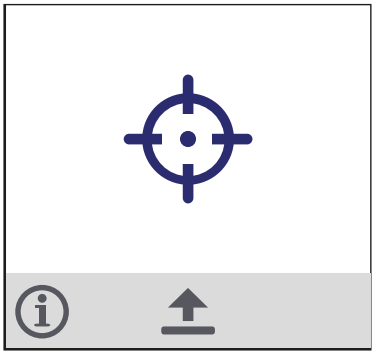


When the FS Reader is linked to the system for the first time, this screen shows that no employee and no activity has been scanned yet.



When the FS Reader has been used before, it will remember the employee number and activity number that were most recently scanned.

Is this example, the most recent employee #124 performed #25 as most recent activity.



This display is shown continuously when the FS Reader is scanning in search for an RFID tag.

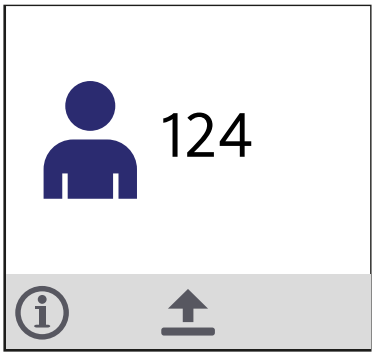
When the FS Reader is waiting for an action from the user, the icon is blinking on and off.

After 20 seconds the display is less bright and after 30 seconds the display switches to power save mode.

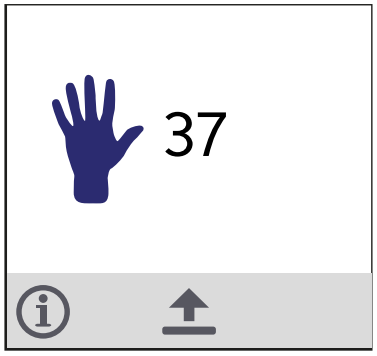
Scanning of basic tags

Pressing the large scan button scans the RFID tag held in front of the FS Reader. If scanned, the screen will display the type and number of the tag scanned and the FS Reader provides haptic (buzzer and vibration) feedback.

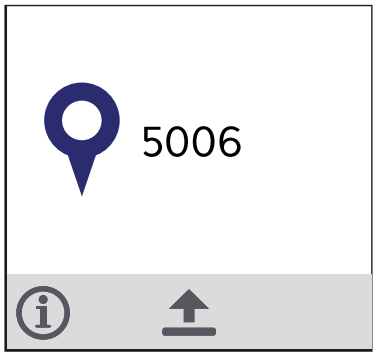
The following basic tag types can be scanned:



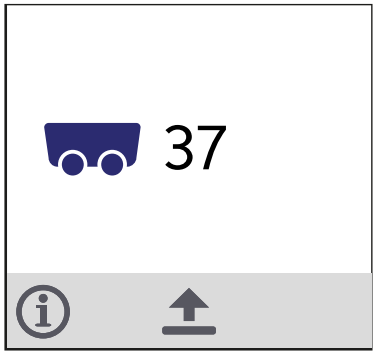
Employee #124 has been scanned.



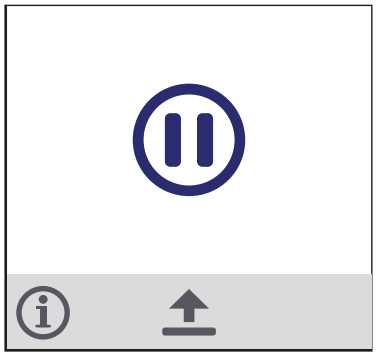
Activity #37 has been scanned.



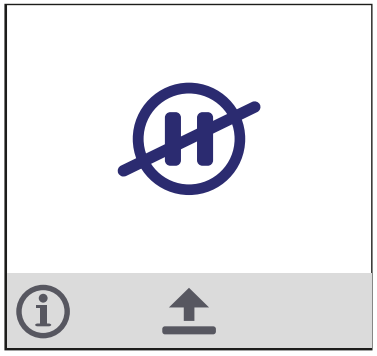
Location #5006 has been scanned.



Container #37 has been scanned.

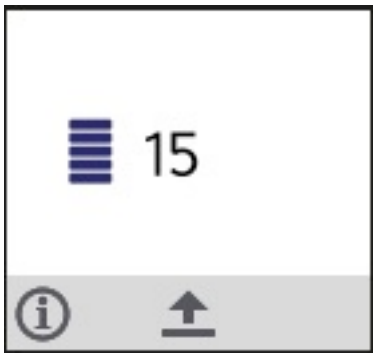


The start of a break has been scanned.



The end of a break has been scanned.

Scanning of number tags

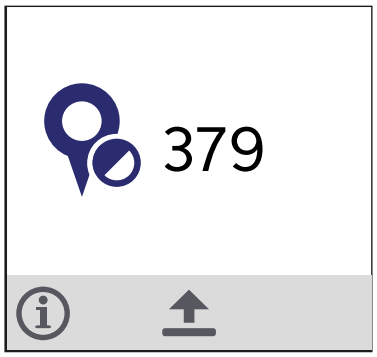


When an employee scans a number tag, that number will be shown on the display next to the quantity icon.

When another number tag is scanned within one minute, while no other tag was scanned in between, the sum of the previous amount and the new tag value will be shown. This can be repeated as long as required.

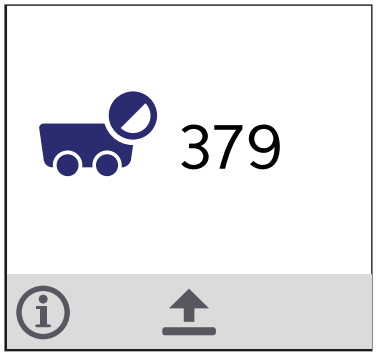
The FS Reader also supports scanning of tags with negative values.

Scanning of special situations



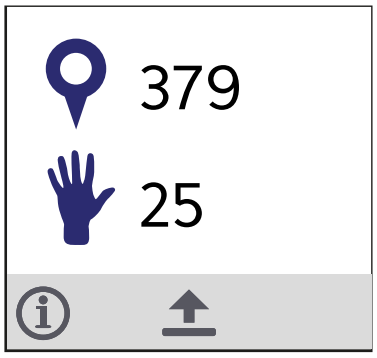
Location marked uncompleted

This is achieved by scanning the same location tag twice within 1 minute, without any other tag being scanned in between.
It indicates that the scanned location was not yet completed when the employee stopped his activity.



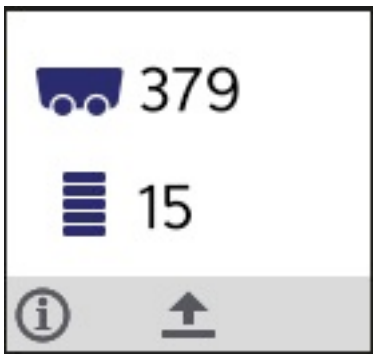
Container marked uncompleted

This is achieved by scanning the same container tag twice within 1 minute, without any other tag being scanned in between.
It indicates that the scanned container was not yet completed when the employee stopped his activity.



Combined tag: activity + location

An example of an activity tag with location is used at a weighing station at a tomato sorting machine.



Combined tag: container + quantity

A container tag with quantity is for example used when a container is always filled with a fixed number of boxes.

Store Registrations

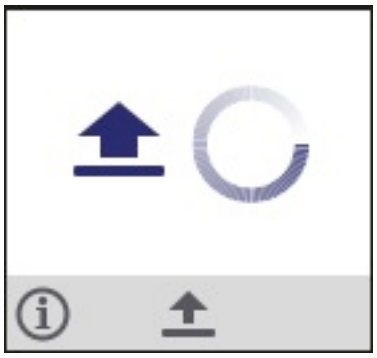
After finishing one or more registrations, the user of the FS Reader can trigger the storage of the registrations in the central system; this can be triggered either manually, or in some cases automatically.

Manual trigger:

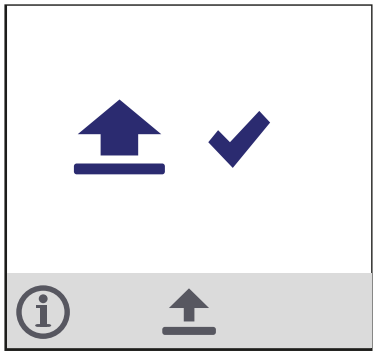
The employee starts the store-function by pressing the middle soft button at a chosen moment.

Automatic trigger:

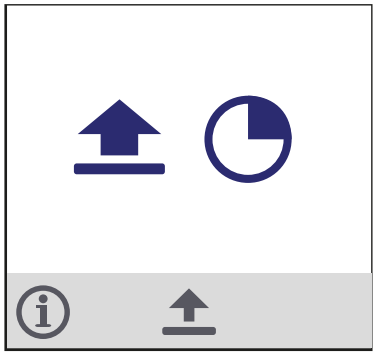
When the FS Reader is put into the cradle the system automatically triggers storage of all registrations.



When pressing the **store button** , the FS Reader transmits all scans over the wireless network to the central server and waits to receive a confirmation message that indicates that all information has been received correctly.



The checkmark indicates that the confirmation message has been received by the FS Reader, indicating that all information has been saved on the central server and that the FS Reader is not required anymore to keep the information available.



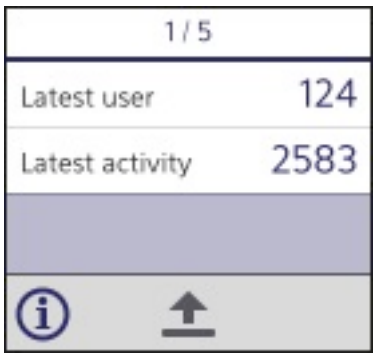
The display will show when the registrations are pending.

As soon as a connection can be established, the FS Reader will upload automatically. There is no need to re-scan the tags or upload again.

In the diagnostic screen #4 (see next section) the user can see when all registrations have been transferred.

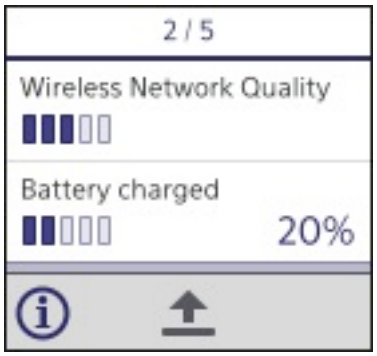
Diagnostic information

Pressing the left soft button repeatedly will cycle through five diagnostic screens. This cycle will be ended by pressing any other button.



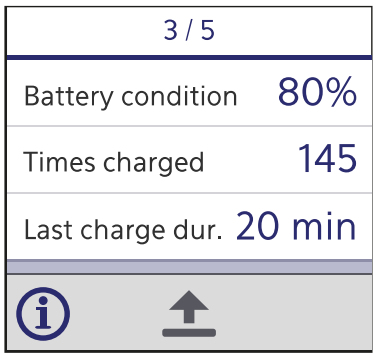
Latest user:
The last person tag scanned with the FS Reader.

Latest activity:
The last activity tag scanned by the FS Reader.



Wireless Network Quality:
The quality of the signal to the current access point (FS Router or FS Concentrator) to which the FS Reader is connected.

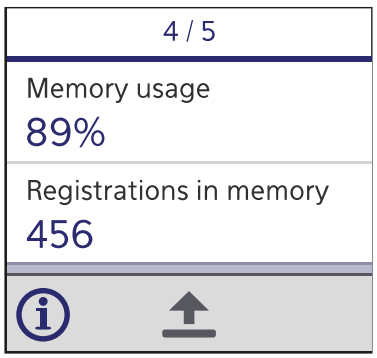
Battery charged:
The percentage of power in the battery, compared to the maximum power capacity of the battery.



Battery condition:
The portion of the original charge capacity the battery is capable of charging now.

Times Charged:
Number of times the FS Reader battery has been charged.[2]

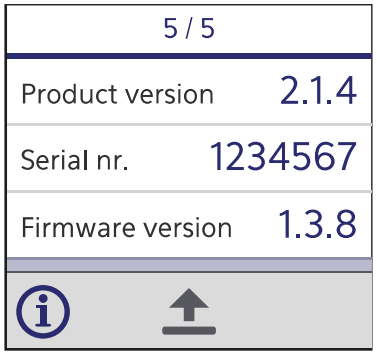
Last charge dur:
Duration of the last charging time of the FS Reader.



Memory usage:
Percentage of the memory of the FS Reader currently in use.

Registrations in memory:
Number of registrations in the FS Reader that have not yet been stored in the central server.

[2] This number will reset to zero when the battery is disconnected from the FS Reader.



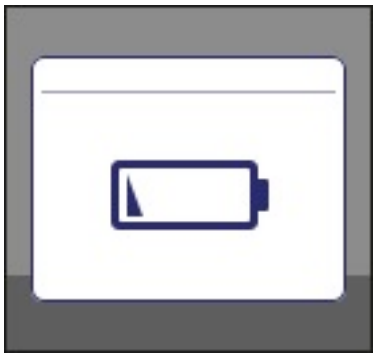
Product version:
Version of the electronics of the FS Reader.

Serial nr:
Serial number that identifies the FS Reader.

Firmware version:
Version of the firmware currently installed in the FS Reader.

Warning messages

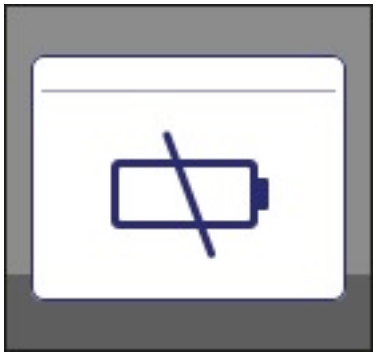
The FS Reader can show several warning messages on the display; when these appear, the FS Reader will also attract the attention of the user by generating two beeps with the buzzer, shortly activating the vibration motor and blinking the led red continuously.



Battery Low

This icon is shown on the display when the battery capacity is lower than 15% of its full capacity. The user is warned that the FS Reader should be placed into the FS Cradle soon.

Under normal conditions, the FS Reader can be used for at least one day from the moment this warning is shown for the first time.



Battery Critically Low

This icon is shown on the display when the battery capacity is lower than 10% of its full capacity. The user is warned that the FS Reader should be placed into the FS Cradle immediately.

When the capacity is lower than 5%, the FS Reader switches itself off and can only be activated again by placing it into the FS Cradle. No data will be lost. The led will turn blue when a button is pressed.

Could not upload for a long time

The scans did not reach FS Performance server for more than 24 hours. It is advised to place the reader into the cradle and/or check the data connection.

FS Reader in FS Cradle

When the FS Reader is not being used it should be placed in the FS Cradle to recharge the battery. [3]

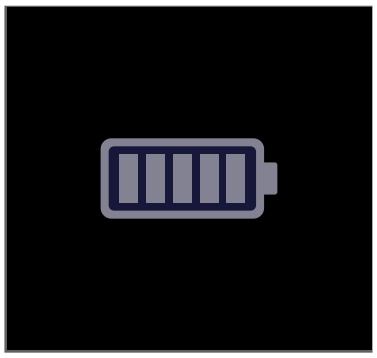
Once in the cradle, the FS Reader uploads any available registrations to the FS Performance central server. When that has been completed, the FS Reader will check whether a new firmware version is available on the server to download.

In case the FS Reader cannot communicate with the FS Concentrator while placed in the FS Cradle, it will listen to all six pre-configured frequencies for wireless communication to detect whether the network has switched to a different frequency. If the FS Reader detects a new frequency, the unit will continue to work normally, without loss of any registrations.

While in the FS Cradle, the led on the FS Reader will turn red while charging the battery and turn blue when the battery has been charged completely.

If a new version of the firmware is available, the FS Reader will automatically download it into the device.
When the download has been completed, the new version will be installed while showing the 'updating'-icon on the display.

If the FS Reader is removed from the FS Cradle before completing the download or installation, the action is cancelled and will be repeated the next time the FS Reader is put into the FS Cradle.



While placed in the FS Cradle, the FS Reader will show the charging icon, showing five steps of the charging progress.

The led will turn red as long as the FS Reader is charging and blue when the battery is full.

[3] However, when the FS Reader is expected not to be used for a long period of time, then it would be better for durability of the battery to set the FS Reader in "Transport Mode".

Service

Replace battery

To avoid loss of data, make sure to do a final upload with the FS Reader.

After replacing the battery, fully charge the battery for the best performance.

CAUTION:
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

1. **Upload registrations.**
   To avoid loss of data, make sure to do a final upload with the FS Reader by pushing the middle soft key. Wait until all registrations have been transferred from the FS Reader (see section “Store Registrations”).
2. **Replace the battery**:
   a. Open the FS Reader by unscrewing the four screws at the backside, using a Torx T10 screwdriver.
   b. Take out the old battery and position the new battery.
   See section “Technical specifications” on page 21 for the correct type of battery.
   c. Close the FS Reader and fasten the four screws again.
3. **Place the FS Reader in the FS Cradle.**
   The FS Reader will restart automatically. Fully charge the new battery for the best performance.

Reset for usage at other location

1. Upload all registrations from the FS Reader.
2. Unlink the FS Reader in the FS Reader Software.
3. Enter the FS Reader Service menu, select the “Factory reset” option and confirm by pressing the indicated ‘Yes’ key.

The FS Reader is now ready to move it to a different location and take it into operation in accordance with the normal procedure for a new FS Reader.

Troubleshooting

This chapter provides solutions for the most frequent problems with the equipment. If you have a problem that cannot be resolved using the information in this chapter, please contact Priva.

Troubleshooting – general

Certain activities may only be performed by authorised installers/service engineers because they require specialist knowledge and skills. These activities are indicated by "Installer" in the table below.

Problem	Possible cause	Solution(s)

Appendices

Technical specifications

- Dimensions:
  - Length: 133 mm (incl. leash)
  - Width: 60 mm
  - Depth: 30 mm (incl. clip)
  - Weight: 122 gram
- Battery:
  - Type: Li-ion battery EB494358VU
  - Cell Model No: 454354AR 1350 mAh
  - Voltage: 3.7 V (typical; min 3 V, max 4.23 V)
- Supported frequencies for the wireless communication:
  - Europe and Africa: 869.5 MHz and 868.3 MHz
  - America: 915.0 MHz and 916.0 MHz
  - Asia and Oceania: 920.0 MHz and 921.0 MHz
- Wireless communication sending power:
  - EIRP: 9.02 mW (max)
- Transport / storage conditions:
  - Temperature: -40 .. 70 °C
  - Relative humidity 10 .. 95 %
  - Ambient pressure 70 .. 105 kPa
- Operating conditions:
  - Temperature (ambient) 0 .. 50 °C
  - Temperature change max 30 °C / day
  - Relative humidity 20 .. 95 %
- RFID scanning:
  - Supported type: Hitag S 2048
  - Frequency: 125 kHz
- Approvals / certifications that are pending:
  - CE
  - C-Tick

EC Declaration of Conformity

The manufacturer:

Name manufacturer	Priva B.V.
Manufacturer's address	Zijlweg 3 2678 LC De Lier Postbus 18 2678 ZG De Lier Nederland

declares that the product:

Product name	FS Reader
Function	handheld device for registration of labour

is in conformity with the essential requirements of the following European Directives:

- Low Voltage Directive 2014/35/EU
- R&TTE Directive 1999/5/EC
- Electromagnetic Compatibility Directive 2004/108/EC

and conforms to the following harmonized European Standards:

EN 60950-1:2006	Information technology equipment - Safety
EN 300 220-1 V2.4.1	ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
EN 300 220-2 V2.4.1	ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods
EN 300 330-1 V1.8.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 1: Technical characteristics and test methods
EN 300 330-2 V1.6.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 301 489-01 V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 301 489-03 V1.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
EN 62311:2008	Assessment of electronic and electrical equipment related to human

	exposure restrictions for electromagnetic fields (0 Hz-300 GHz)

The technical file was compiled by the department Product Development of Priva B.V.

The Netherlands, De Lier, December 2015

M. Prins
Managing Director

FCC Statement

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 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.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC Rules. 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.

IC Statement

This device complies with Industry Canada licence-exempt RSS standard(s).
Operation is subject to the following two conditions:

1) this device may not cause interference and
2) this device must accept any interference, including interference that may cause undesired operation of the device

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.

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