

FS Concentrator

Installation and service



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FS Concentrator

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About this manual

Aim and scope

This manual concerns the FS Concentrator, a wireless access point for the labour registration system for the horticulture industry.

This manual contains all of the information required to safely and correctly transport, install, commission and maintain the FS Concentrators. 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 FS Concentrator.

Target groups and required competencies

Target group	Tasks and responsibilities	Training, knowledge and experience required
Installers/ service engineers	<ul style="list-style-type: none">• Transportation• Positioning• Installation• Commissioning and set up• Testing after initial commissioning and problem solving• Operation• Annual checks• Disposal of the unit at the end of the service life	<ul style="list-style-type: none">• technical training in the field of electrical engineering• experience with electrical installations for the horticulture industry• Priva product specific training• command of (technical) English






Availability of the manual

This manual is exclusively intended for installers and service engineers.


Related documents

FS Reader Software – User Manual

Symbols in this manual

	Live parts (danger of electrocution)
	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



Before starting to work with the product, read the entire manual so that you are familiar with all safety instructions and safety precautions.

In addition, read any other manuals supplied with specific components.

Safety - general

- Only Priva approved installers/service engineers who have received product-specific training from Priva are allowed to install, configure, repair and, if necessary, alter the equipment
- Making alterations to the safeguards and safety icons on the equipment is prohibited.
- Both the installer/service engineer and the user must check and maintain the equipment (the safeguards in particular) in accordance with the instructions in this manual. Keep the product clean and the surroundings tidy.
- Report faults or damage to Priva immediately. Inactivate the equipment and do not use it if a deficiency is observed.
- Only use original spare parts for repairs (refer to the price list).
- After repairing the unit, check the correct status and functioning of the equipment.
- If the user allows personnel to operate the equipment, he must provide sufficient instructions. In particular, this should be on the safety risks and safety instructions as stated in this manual. He must also supervise correct compliance with the instructions.
- Ensure that the personal protective equipment prescribed in this manual is available and that it is used.
- Display the safety icons that are applicable in the room where the equipment is set up.

Electrical safety



The unit is powered from the mains voltage. There is a potential hazard of electrocution or fire resulting from a short circuit. Therefore, comply with the following safety instructions:

- Keep the housing of electrical components (cabinet, pump etc.) closed.
- Keep the electrical parts dry.
- Ensure that the grounding is correctly connected.
- Ensure that the unit is connected to its own fuse group with the correct fuses/circuit breakers.

During installation or maintenance, or while resolving malfunctions it may be necessary to open the housing of the electrical components. In this case, comply with the following safety instructions:

- Make sure there is no voltage on the unit by removing the plug from the socket outlet, or by removing fuses / disconnecting circuit breakers.
- If the unit cannot be made free of electricity, then take extreme care. Use well insulated tools and do not touch wire ends, connections and electrical components with bare hands. Keep the surroundings dry and ensure that there is someone close by to keep an eye on you.
- Wear a grounded wristband while working in the cabinet. Static electricity can damage the electronic components.

Residual risks

The following risks could not be excluded in the design:

- If the unit is altered or is used in such a way that it becomes contrary to the instructions in this manual, unforeseen risks may occur.

Product description

The FS Concentrator is part of the labour and production registration system of Priva FS Performance.

The FS Concentrator is used to transfer data between the wireless network and the Priva FS Performance database.

Functions and intended use

Functions

The FS Concentrator's main function is to collect registrations being sent over the wireless network and transmit them to the database for storage. Furthermore, the FS Concentrator plays a vital role in the configuration and authorization of new hardware in the system.

Intended use

The intended use for the FS Concentrator is to be positioned strategically in the facility. Once it has been placed efficiently, it is not to be moved unless there are major changes in the layout of the facility. When the FS Concentrator is installed and operational, no further action is required.

Detailed description

The FS Concentrator forms the bridge between the wireless network and the database server. As from this perspective it performs the router functions, so it can also be seen as the first router in the wireless chain.

For the most simple configuration, where a customer only requires wireless access in the pack-house, only one FS Concentrator will be sufficient, thus without any routers.

For larger greenhouses, more FS Concentrators can be used to access the database server from different greenhouse sections on to one network. Each FS Concentrator will manage and control a set of FS Routers that have the best connection characteristics to that FS Concentrator at that moment in time. A maximum of 20 FS Routers per FS Concentrator should be used in one chain.

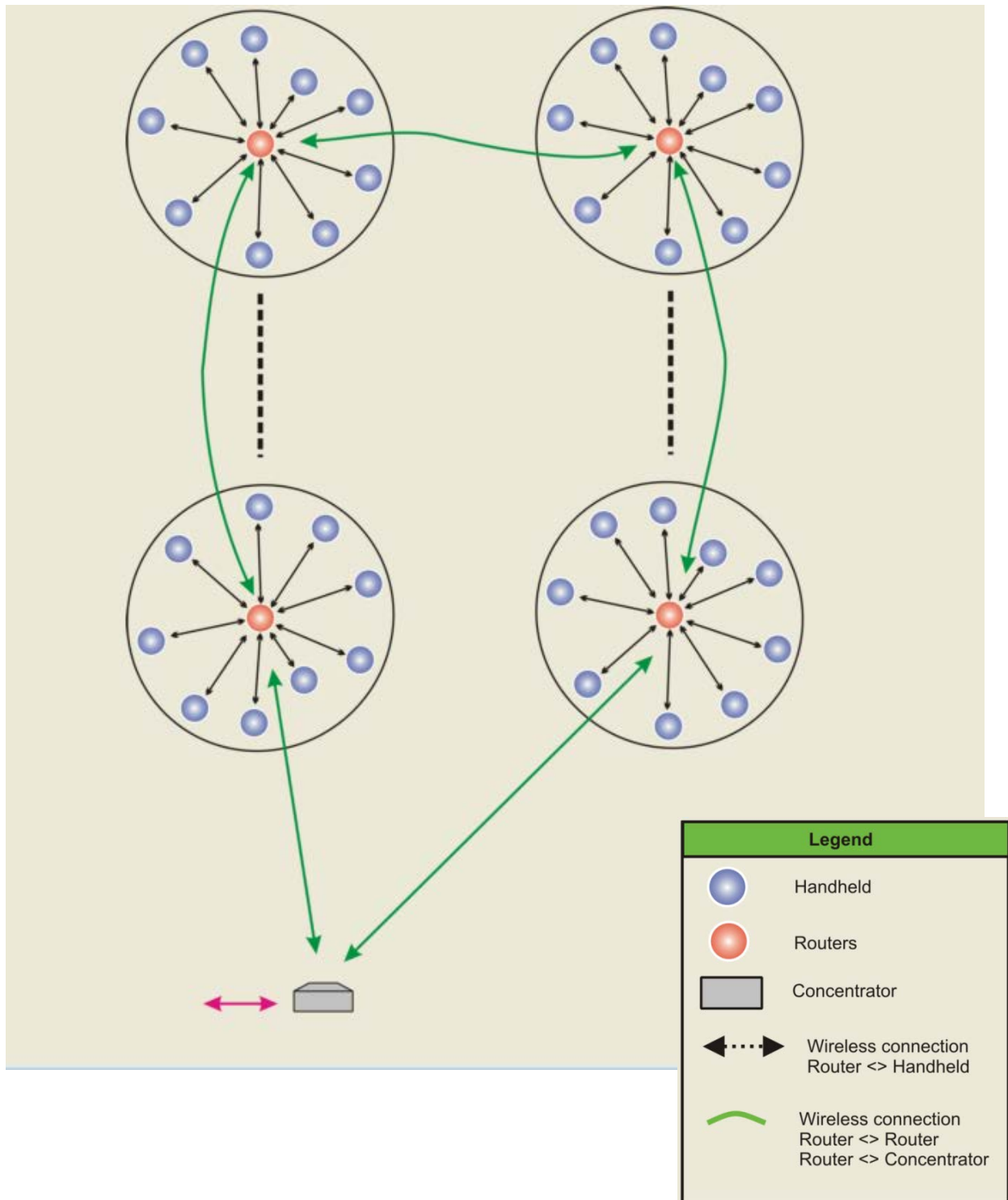
The FS Concentrator can be placed either in the greenhouse or in the packhouse, as long as it can communicate with the first FS Router in the wireless chain. For reasons of optimal speed during heavy data loads, such as updating the firmware in the FS Readers, it is preferred that the FS Concentrator is placed close to the location of the FS Cradles.

The FS Concentrator takes care of the following tasks:

- Forwarding :
 - It forwards the transaction data that will be received from the FS Routers and FS Readers to the Database Server;
 - It forwards network hardware configuration information from the FS Reader Software to the FS Routers and FS Readers.
- Data logging :
 - It logs the network status information of the wireless network.
- Traffic controller :
 - It takes care of the routing, buffering, packetizing, encryption / decryption of the traffic to and from the network.

The FS Readers will communicate wireless with the FS Routers and FS Concentrators; the station with the best signal will be selected. Data that is received by an FS Router from an FS Reader will be transferred wireless to the next router until delivered at the FS Concentrator.

All transaction data is acknowledged by the FS Concentrator. The FS Reader will only flush transaction data from its memory when this acknowledgement has been received.



Transport and storage

Dimensions

Dimensions (including packaging): 225 x 134 x 84 mm.

Weight (including packaging): 800 g.

Contents of the package

The package of the FS Concentrator contains the following items:

- 1 FS Concentrator.
- A horizontal cable entry plug (already placed on the PCB inside the FS Concentrator casing).
- A mounting set containing 4 clips and 4 screws for mounting the FS Concentrator to (for instance) a cable tray.
- 3 m CAT.5E UTP Ethernet cable.
- A water-resistant Ethernet connector plug.



Cable entry plug



Mounting set



Ethernet cable



Ethernet connector plug

No power cord is delivered with the FS Concentrator.

Conditions during transport and storage

The ambient conditions must remain within the following limits during transport and storage:

- Temperature: 0 ... 50 °C
- Relative air humidity: maximum 95 % (non-condensing)
- Rain: the packaged equipment must be kept dry and must therefore not stand outdoors.
- Sunlight: the packaged equipment must not stand in bright sunlight. Otherwise, the internal temperature may become too high causing deformation in the plastic components.
- Vibrations: avoid exposure to strong vibrations.

Installation - positioning the unit

Location and environmental conditions

The FS Concentrator has been tested extensively under greenhouse conditions and therefore does not have to be placed in an environment with specific conditions.

Basic facility requirement

In order for the FS Concentrator to be properly installed, the following facilities need to be present and in close proximity to the location of the FS concentrator:

- Power socket
- Ethernet connection

The FS Concentrator package will contain screws and clips that can be used for mounting the FS Concentrator to a wall.

Positioning the unit

The FS Concentrator must be positioned in the same orientation as the FS Routers in its wireless network, i.e. the same side must be up, to achieve the best communication throughput.

The connector side of the FS Concentrator should be at the bottom:

- Because of reasons of water tightness.
- To allow that the led indicator will be visible.

Because the antenna for the wireless communication is placed at the side of the connectors, this side must be free of metal masking.

The FS Concentrator must be placed near the FS Cradles, in such a way that FS Readers that are placed in the FS Cradle can communicate with the FS Concentrator (especially for firmware update). However, a minimum distance of 1 meter should be taken into account.

In total a maximum of 254 FS Concentrators + FS Routers (together) can be supported within one wireless network. No specific additional constraints apply for the FS Concentrators.

Installation - electrical part



Because the FS Concentrator is a permanently connected equipment, a readily accessible disconnect device must be incorporated external to this equipment.



An overcurrent protective device for max 20 A must be provided external to this equipment.



The electrical power shall be connected through cables according to local regulations.

Electrical connection

The FS Concentrator can be connected to any standard power socket. This is done by connecting any standard power cable according to local regulations.

The following steps are to be taken in account to properly install the FS Concentrator:

1. The installer selects the ideal location for the FS Concentrator.
2. The installer opens the casing of the FS Concentrator with a screwdriver.
3. Make sure that the power switch (Figure 1: in the yellow square) is in the "OFF" position.



Figure 1

-
4. The installer connects a power cord. This is done by splitting the cord and connecting two wires to the provided cable entry plug. The location on the PCB on which the plug should be connected is shown in the blue square in Figure 1.
L = Line wire;
N = Neutral wire.
 5. Make sure that the jumper indicated in the green square in Figure 1 is in the "KEEP" position (refer to page 18).
 6. Mount the FS Concentrator to the selected location, for instance by using the supplied clips and screws.
 - a. Fasten the clips to the casing by screwing the screws through the holes in the corners of the casing into the clips.
 - b. Then fasten the FS Concentrator by means of these clips to the intended location, for instance with screws or bolts and nuts (not provided in the FS Concentrator package).
 - c. Please obey any applicable local regulations.



7. Fasten the provided Ethernet connector plug to the also provided Ethernet cable according to its instructions.
8. Connect the Ethernet cable to the external Ethernet connector of the FS Concentrator and to the network.
9. Set the switch indicated in the yellow square in Figure 1 to the "ON" position.
10. Close the casing and connect the electrical power.
11. The installer makes sure that the led on the FS Concentrator is functioning, indicating the power and Ethernet connection have both been properly connected.

Installation - partie électrique



Le FS Concentrator est un équipement connecté en permanence, un dispositif de déconnexion facilement accessible doit être incorporé externe de cet équipement.



Un dispositif de protection contre les surintensités pour max 20 A doit être fournie externe de cet équipement.



La puissance électrique doit être relié par des câbles conformément aux réglementations locales.

Raccordement électrique

Le FS Concentrator peut être raccordé à n'importe quelle prise de courant standard. Cela se fait en connectant un câble d'alimentation standard conformément aux réglementations locales aux FS Concentrator.

Les étapes suivantes doivent être prises afin d'installer correctement le FS Concentrator:

1. L'installateur sélectionne l'endroit idéal pour la FS Concentrator.
2. L'installateur ouvre l'enveloppe pour la FS Concentrator avec un tournevis.
3. Assurez-vous que l'interrupteur d'alimentation (Figure 2: dans le carré jaune) est dans la position «OFF».



Figure 2

-
4. L'installateur se connecte un câble d'alimentation. Cela se fait en divisant le cordon de raccordement et deux fils à la prise prévue d'entrée de câble. L'emplacement sur la carte sur la fiche, qui épaulément être connecté est affiché dans le carré bleu sur la figure 2.
L = Fil de ligne;
N = Fil neutre.
 5. Assurez-vous que le cavalier indiqué dans le carré vert dans la figure 2 est dans la position «KEEP» (voir page 18).
 6. Fixer le FS Concentrator à l'emplacement sélectionné, par exemple en utilisant les clips et les vis fournies.
 - a. Fixer les attaches au boîtier en vissant les vis dans les trous dans les coins de l'enveloppe dans les clips.
 - b. Fixez ensuite le FS Concentrator à l'aide des clips à l'emplacement prévu, par exemple avec des vis ou des boulons et des écrous (non fournis dans le package).
 - c. Se il vous plaît respecter toutes les réglementations locales applicables.



7. Fixez le connecteur fourni Ethernet au câble Ethernet également fourni selon ses instructions.
8. Branchez le câble Ethernet au connecteur Ethernet externe et le réseau.
9. Mettre l'interrupteur indiqué dans le carré jaune sur la figure 3 sur "ON".
10. Fermez le boîtier et connecter l'alimentation électrique.
11. L'installateur permet de s'assurer que le conduit sur la FS Concentrator fonctionne, indiquant la connexion d'alimentation et Ethernet ont tous deux été correctement connecté.

Operating software

The functionality of the FS Concentrator is in its firmware.

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

The FS Concentrator can be updated with the latest firmware. Please, refer to the "FS Reader Software – User Manual" for more information.

Commissioning



Only Priva approved service engineers/installers who have received product-specific training from Priva are allowed to commission the unit.

Preparations

The FS Concentrator is delivered with a default IP-address and netmask: 192.168.1.1 / 255.255.255.0. The FS Concentrator must be configured to a static IP-address for the network of the customer.

In order to connect to the FS Concentrator, the IP-address 192.168.1.1 must be reachable from the computer that will be used for the configuration. The best way is to set this computer to an IP-address in the same range, e.g. 192.168.1.2 and to connect this computer directly to the FS Concentrator through an Ethernet cable.

The configuration can then be done through a web interface on port 3080:

<http://192.168.1.1:3080>

The required username / password is priva / priva.

The screenshot shows a web browser window titled "S-box Configuration" with the address bar displaying "192.168.1.1:3080". The page has a blue header bar with "Concentrator configuration" on the left and "Logged in as: priva | Log out" on the right. The main content area is titled "LAN configuration" and contains two radio buttons: "DHCP" (unselected) and "Static" (selected). Below these are input fields for "IP address" (containing "192.168.1.1") and "Netmask" (containing "255.255.255.0"). A message states: "Activating the new network configuration requires a reboot. This may take up to 2 minutes." At the bottom of the configuration area is a button labeled "Change network configuration".

Set the IP-address to the required (Static!) value and press the “Change network configuration” button. The FS Concentrator will then reboot and after about 2 minutes the new address will have been activated. Remember the IP-address: it must be entered into the FS Reader Software while registering the FS Concentrator.

Reset to factory defaults

If the FS Concentrator has been set to a wrong or unknown IP-address, it won't be available on the network. This situation can be resolved by means of a jumper on the Printed Circuit Board (PCB).



Jumper in 'KEEP' position.



Jumper in 'RESET' position.

Put this jumper in the RESET position and restart the FS Concentrator (Power Off – Power On): then the FS Concentrator resets itself to the factory default configuration. Please wait two minutes to allow the FS Concentrator to reset itself.

Switch off the FS Concentrator and put the jumper back to the “KEEP”; then the configuration can be executed as described before.

Commissioning

The remainder of the installation steps are described in the “FS Reader Software – User Manual”:

- a. Select the correct Region for the wireless communication signals.
- b. Register the FS Concentrator by providing the serial number and configured IP-address.

Operation

The FS Concentrator works automatically once installed and therefore no further action is needed.

The FS Concentrator has a tri-colour status led: Red + Green + Orange, which has the following signalling function:

Led shows:

- Off
- Red
- Orange
- Green continuous
- Green blinking

Indicates:

FS Concentrator is switched OFF

FS Concentrator is switched ON and contains an error

FS Concentrator is switched ON and had no data activity during the last 30 minutes

FS Concentrator is switched ON and did have data activity during the last 30 minutes

FS Concentrator is switched ON and has currently data activity.

Taking out of operation



If the FS Concentrator must be replaced by another one, first add the new FS Concentrator before removing the old one! (Else all FS Readers must be rebooted to connect to a new network.)

The following steps must be taken to remove the FS Concentrator from the system:

1. The steps required to remove the FS Concentrator from the labour registration system are described in the "FS Reader Software – User Manual".
2. The installer disconnects the Ethernet cable.
3. The installer disconnects the power cord.
4. The unit is now ready to be shipped for repair or decommissioning.

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. Those activities are indicated by "Installer" in the table below.

Problem	Possible cause	Solution(s)
Led off	Power cord is disconnected	Reconnect power cord
Led off	Fuse is broken	Replace the fuse
No registrations	Ethernet cable is disconnected	Reconnect Ethernet cable
Led red		
Led orange		

Maintenance and repair

The FS Concentrator does not require regular maintenance in order to keep it working.

If the FS Concentrator is in need of repair, the customer will contact Priva B.V. after which the product can be sent back to Priva B.V. for repair or possible replacement.



Warranty void if seal is broken.

Firmware updates

If the FS Concentrator requires a new firmware version, this should be made available in the “FS Reader Software”. When this has been completed, all FS Concentrators in the network will upload and activate the new firmware automatically. The network regulates itself that only one device will be updated at a time.

When the FS Concentrator is updated with its new firmware, it will be temporarily inactive. This takes less than a minute.

Disposal of waste equipment

The unit must be disposed of at the end of its service life.

The product can be disposed of according to regulations concerning electrical devices in the designated country.



The equipment is marked in accordance with European directive 2002/96/EC relating to waste electrical and electronic equipment (WEEE):



The mark indicates that the equipment cannot be disposed of with other household waste at the end of its service life. To prevent possible harm to the environment or to human health from uncontrolled waste disposal the equipment must be kept separate from other types of waste and be recycled in a responsible manner, so that the sustainable reuse of material sources is stimulated.

Appendices

Technical specifications

- Dimensions:
 - Length: 210 mm (incl. swivel)
 - Width: 129 mm
 - Depth: 60 mm
 - Weight: 564 gram
- Electrical characteristics:
 - Input voltage: 100 .. 240 Vac
 - Mains frequency: 50 .. 60 Hz
 - Power consumption: 5 W (max)
- 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: 4.84 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 %
- Approvals / certifications that are pending:
 - UL
 - CSA
 - 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 Concentrator

Function

Wireless access point for the labour registration system

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 1: Technical characteristics and test methods
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 2: Harmonized EN covering essential requirements under 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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