

Intellifi Smartspot Professional Installation Guide

Version 1.2

Precautions



Note: before operation please take notice of the regulatory compliance statement and the approved antennas section in order to make sure to comply to local regulations.

- Installation of this product must be performed by a qualified installation partner
- This manual should not be distributed to end users
- When connecting an external antenna to your Smartspot, take notice of the Approved Antennas section, see appendices
- Do not expose the products to rain or moisture
- There are no user serviceable parts inside, refer all servicing to qualified service personnel

Mounting

- A Smartspot Tile can easily be mounted in a dropped ceiling, if it has a standard dimension of 595 mm.
- The Smartspots have a VESA mount hole pattern (100 mm), so standard VESA compatible mounting solutions can be used.
- A Tile can also be suspended with cables. It is safe to drill holes in the aluminium plate as long as you stay away from the antennas. Please contact Intellifi first to discuss your application.
- Do not expose the products to rain or moisture.
- For outdoor use, the Smartspot can be placed in a large plastic box with an IP67 or better protection class. Please contact Intellifi first to discuss your application.

In case you need support: contact your distributor or Intellifi.

support@intellifi.nl

To get your Smartspot connected, you need power, Internet connectivity and some tags



1 Intellifi Smartspot

- You may have a regular Smartspot, a Smartspot Tile, a Smartspot multi-8 or a Smartspot BLE.



2 Power

- All Smartspots support Power over Ethernet (this is the preferred way of powering) and come with an external 110V/230V power supply for convenience.



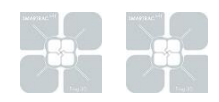
3 Internet connectivity

- Spots need Internet connectivity to connect to the cloud Brain



4 Tags

- You'll need a couple RFID tags or BLE tags to check that things are running well.



Connect and power the Smartspot according to the steps below.



Note: before operation please take notice of the regulatory compliance statement and the approved antennas section in order to make sure to comply to local regulations.

1

Connect the Ethernet port of the Intellifi Smartspot to an Ethernet cable with Internet connectivity

2

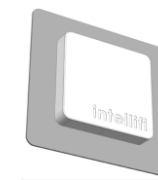
Connect power to the smart spot using the power supply

- You may also provide power using Power over Ethernet (PoE) if available.
- The Smartspots provide a short 3-tone beep during startup.
- Most likely a spot will immediately download the latest firmware and restart again and there will be another 3-tone beep as confirmation.

3

Browse with a PC or tablet to <https://brain.intellifi.nl>

- Login with the demo account:
- Username: demo@Intellifi.nl
- Password: demo



Smartspot Ethernet to Internet

Smartspot power (110-230AC)

Smartspot are plug and play

- Automatic IP configuration (DHCP)
- Automatic antenna detection at startup
- Automatic connect to the Cloud Brain



Access to information via <https://brain.intellifi.nl>

Consult the Smartspot User Quickstart Manual for more information how to use the Smartspot and the web API

FCC Compliance Statement

FCC compliance

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.

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To comply with FCC RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 23 cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada Compliance Statement

Industry Canada compliance

This Device complies with Industry Canada License-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.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter 22367-SMRTSPT has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than 8.5 dBi, are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To comply with Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 35 cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.

Industrie Canada Conformité

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;
- 2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Afin de réduire le risque d'interférence avec d'autres utilisateurs, le type d'antenne et son gain doivent être choisis de telle sorte que la puissance isotrope rayonnée équivalente (PIRE) ne soit pas supérieure à celle permise pour une communication réussie.

Cet appareil a été conçu pour fonctionner avec l'antenne (s) énumérées à la section suivante qui ont un gain maximum de 8.5 dB. Antennes pas inclus dans cette liste ou présentant un gain supérieur à 8.5 dB sont strictement interdits pour utilisation avec cet appareil. L'impédance d'antenne requise est de 50 ohms.

La ou les antennes doivent être installées de telle façon qu'une distance de séparation minimum de 35 cm soit maintenue entre le radiateur (antenne) et toute personne à tout moment. Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

Approved Antennas

The Smartspots are certified with these 3 antennas. For the use of other antennas see next page.

Connected antennas are detected automatically, no software settings needed.
Note: the API has a possibility to disable connected antennas, please consult the web API documentation.

Option 1:

Model	Spot Antenna (A14)
Manufacturer	Intellifi
Antenna Description	Patch Antenna
Polarization	dual linear
Frequency range	860 – 930 MHz
Impedance	50 Ohm
Return Loss	> 10 dB
Gain	8.5 dBi

Option 2/FCC:

Model	Micro Antenna 915 MHz (A75)
Manufacturer	Intellifi
Antenna Description	Ceramic Patch Antenna
Polarization	RHCP
Frequency range	902 – 928 MHz
Impedance	50 Ohm
Gain	4 dBic

Option 2/ETSI:

Model	Micro Antenna 866 MHz (A74)
Manufacturer	Intellifi
Antenna Description	Ceramic Patch Antenna
Polarization	RHCP
Frequency range	864 – 868 MHz
Impedance	50 Ohm
Gain	4 dBic

Option 3:

Model	Shelf Antenna (A84)
Manufacturer	Intellifi
Antenna Description	Patch Antenna (2 pcs)
Polarization	dual linear
Frequency range	860 – 930 MHz
Impedance	50 Ohm
Gain	7 dBi

Other Antennas

When connecting other antennas, make sure the effective radiated power P_{EIRP} is within regulatory limits. This may require reduction of the output power.

- For the USA and Canada it is $P_{EIRP} = 36$ dBm
- For the ETSI region it is $P_{EIRP} = 35.15$ dBm
- $P_{EIRP} = \text{Reader power} - \text{multiplexer loss} - \text{cable loss} + \text{antenna gain}$

Note:

- Multiplexer loss = 1 dB, except for the Multi-16 where it is 2 dB
- Intellifi supplied coax cable LMR195 has a loss of 0.37 dB per meter
- Intellifi supplied coax cable LMR240 has a loss of 0.25 dB per meter
- LMR240 cable is less flexible than LMR195.

If you need assistance in calculating cable losses or maximum power settings, please contact your distributor or support@intellifi.nl

Example 1:

You have a 6 dBi antenna. You want to connect it to a Smartspot Multi-8 using a with 4 meter of LMR195 cable.

When you set the output power to 27 dBm (the recommended value for best performance), the $P_{EIRP} = 27 - 1 - 4 * 0.37 + 6 = 30.52$ dBm

This leaves you with enough margin to satisfy the ETSI, FCC and IC regulations.

Example 2:

You have a high gain antenna with a gain of 12 dBi and you use a cable of 1 meter LMR195.

Now $P_{EIRP} = 27 - 1 - 0.37 + 12 = 37.63$ dBm. This exceeds the legal limits and the power must be reduced in order to comply with the regulations.

For FCC/IC, the power setting must be reduced by 2 dB (whole steps only), for ETSI it must be reduced by 3 dB.