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Project Name	INT NODE HP			Checked by	
Subject	INT NODE HP Product Specification			Approved by	

Product Specification

INT NODE HP

2024. 11. 25

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1. Summary

It defines the part of the circuit INT NODE HP

2. Product Specification

2.1 Electrical Specification

Type No.	Description
Input Voltage	DC 12V
Power consumption	< 2.5W Max. (Typ. 0.3W)
Protocol	IEEE 802.15.4 / Zigbee Pro
Frequency	2.4 GHz (ISM band: International) / 2400 ~ 2480 MHz
RF Tx Power	Max. +3dBm (Typ. 2dBm)
RF Rx sensitivity	-96dBm
Data rate	250kbps
Dim interface	PWM
ADC Input Level	0 ~ 1.5V
Interface	UART1 (Debug & Download)
Dimensions (W x L)	76.0 x 51.0 mm
Antenna	IFA, Gain 2.13dBi
Number Of Channel	16
Modulation	DSSS-OQPSK(Zigbee)

2.2 Environmental Specification

Item	Specification
Operating Temp. Range	-30°C ~ +70°C /IEC 60068-2-1 Ab
Storage Temp. Range	-40°C ~ +70°C /IEC 60068-2-2 Bb
Operating Humidity	5% ~ 95% (No dew condensation) / IEC 60068-2-56

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2.3 Target /Tolerance / Max Tune Up Power

1) FCC

Target Power	2 dBm
Tolerance	±1 dB
Max Tune Up Power	3 dBm

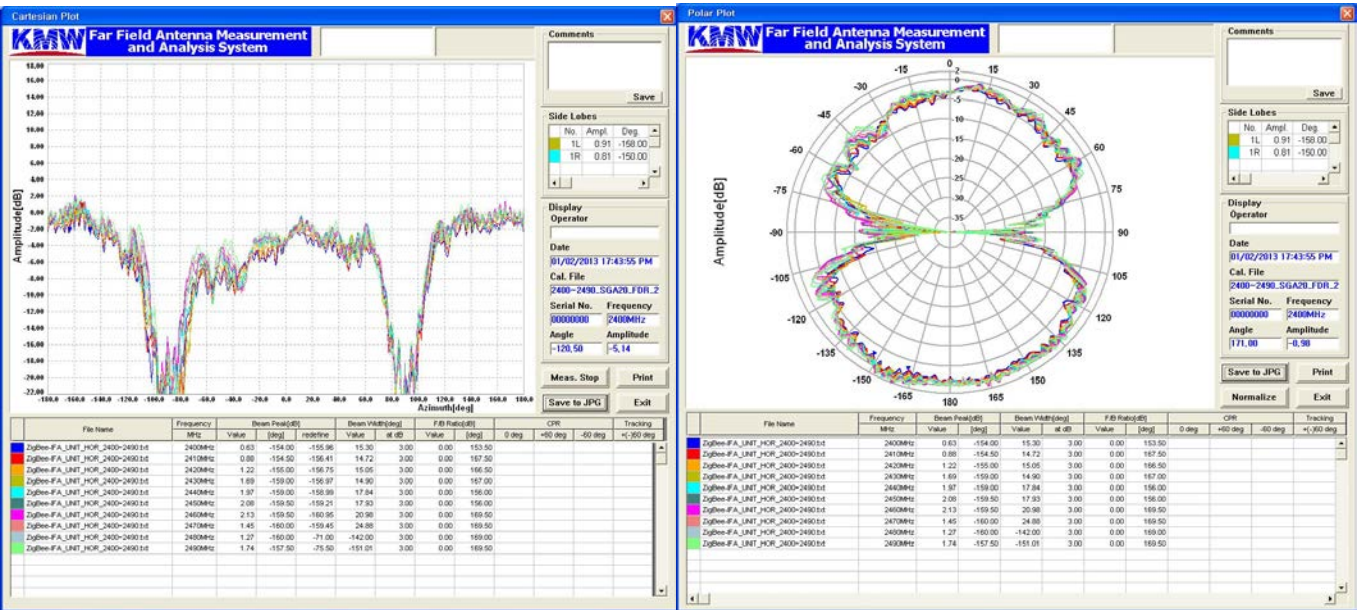
2) ISED

Target Power	4 dBm
Tolerance	±1 dB
Max Tune Up Power	5 dBm

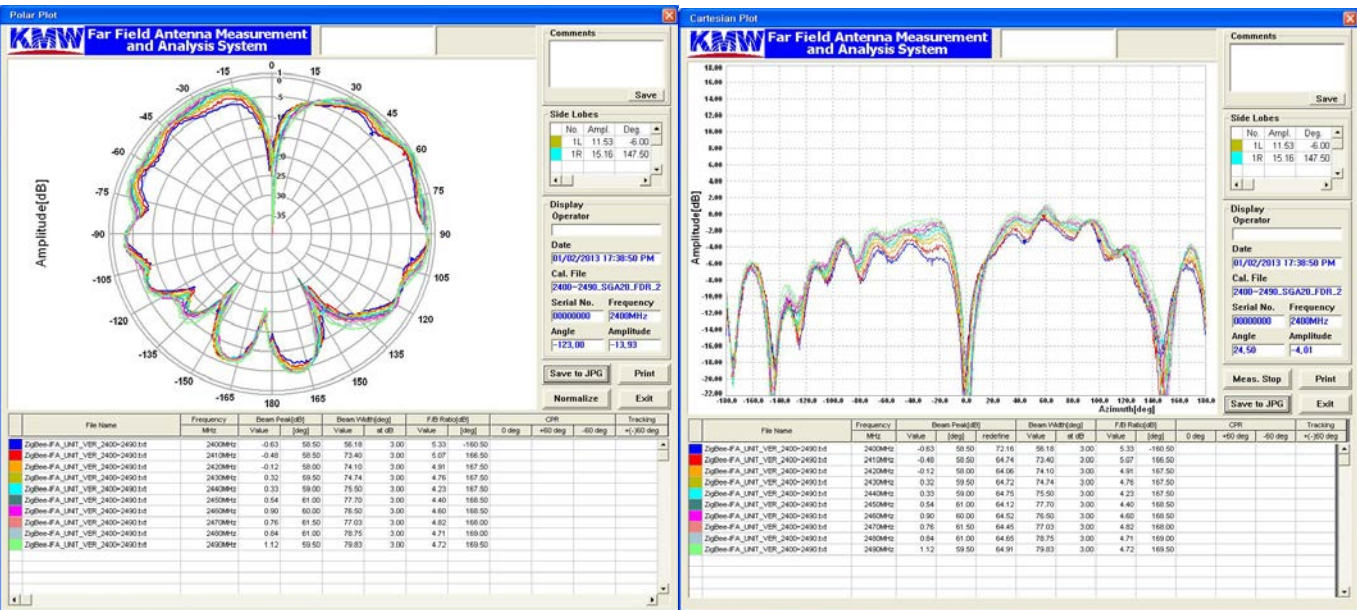
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3. Antenna Characteristic

- Horizontal



- Vertical



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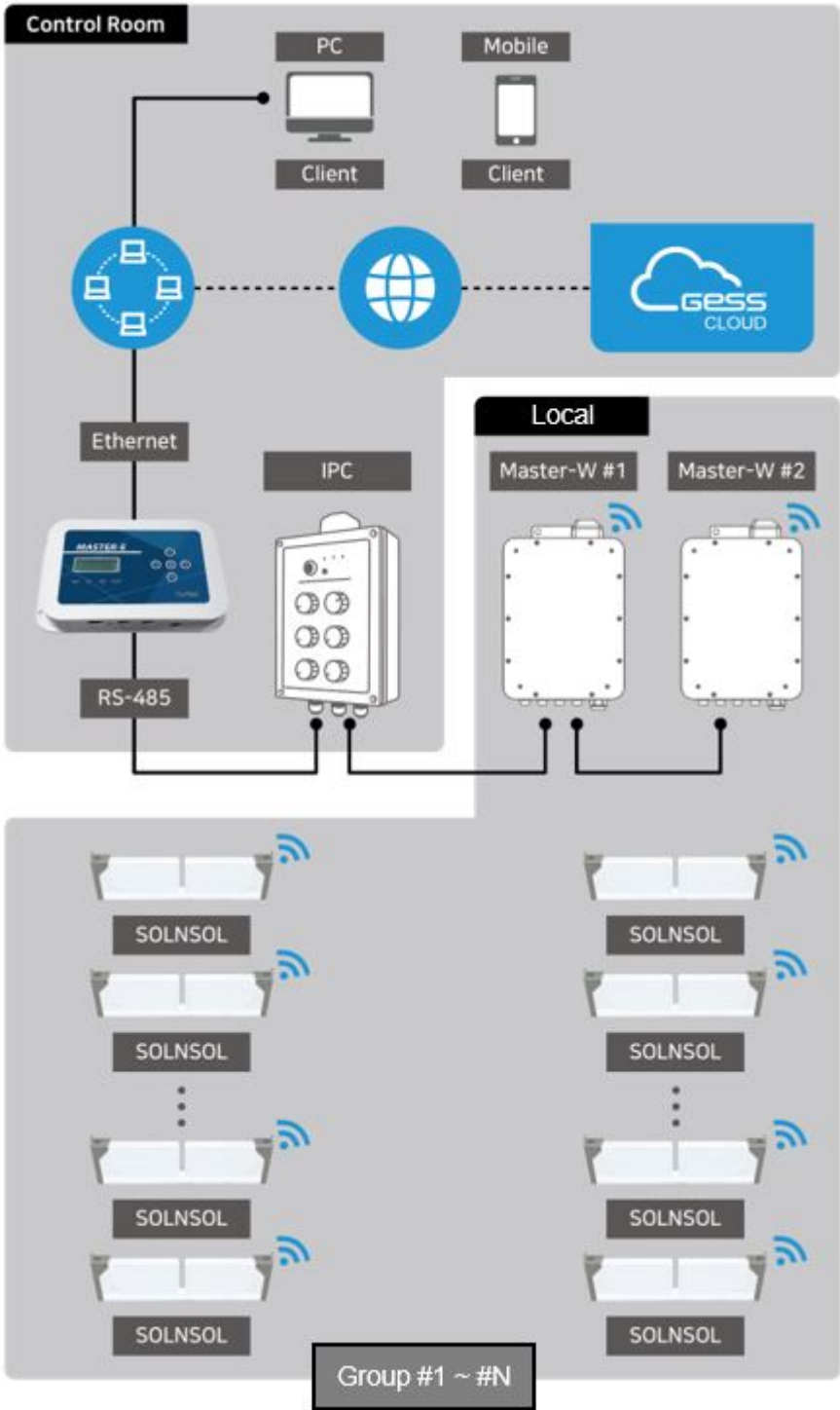
4. Main Function

- 4.1. Dimming control using PWM.
- 4.2. Real-time monitoring and control with Zigbee wireless communication
- 4.3. Master-E notified when an alarm occurs in the lamp.
- 4.4. Download using the debug port and remote

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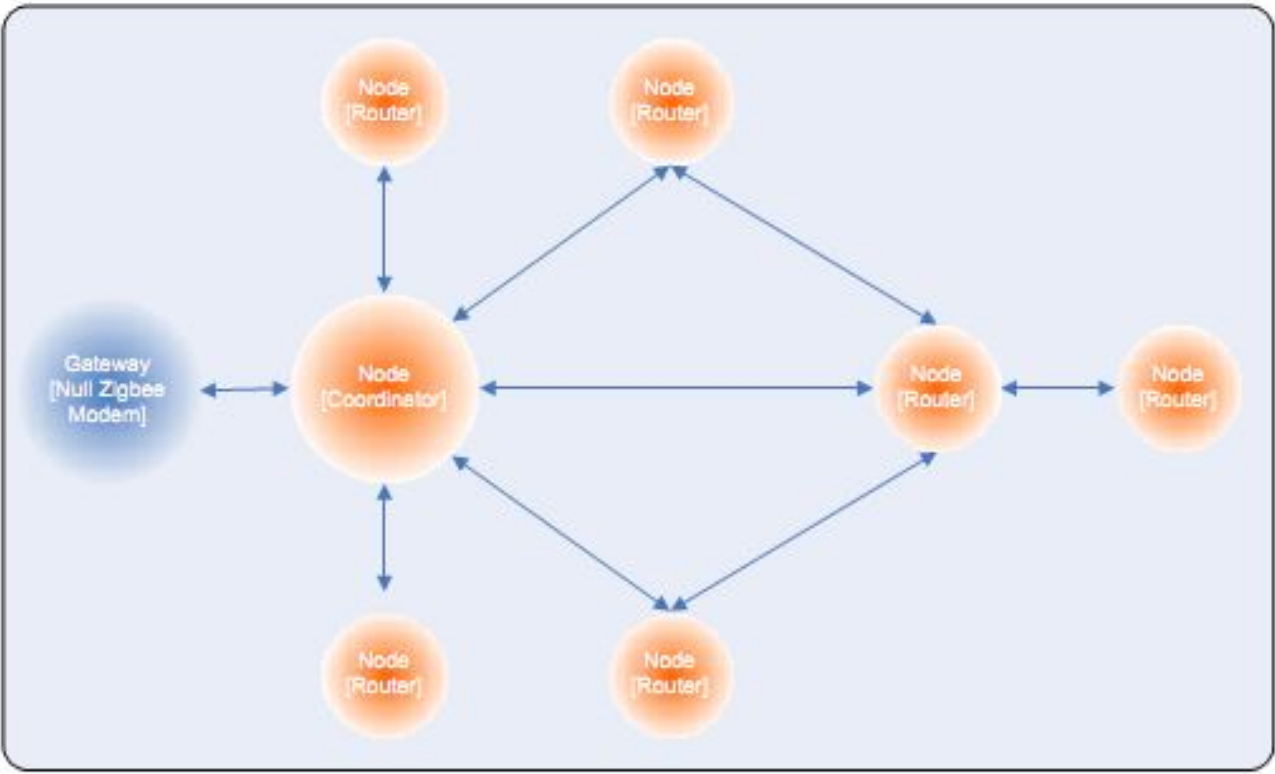
5. System Configuration

5.1. GeSS System Block Diagram



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5.2. Zigbee Network Configuration



<Zigbee Mesh Topology Diagram>

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6. FCC, IC Statement

6.1. FCC Statement

1) FCC Compliance Statement

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.

2) FCC Interference 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 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 which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

3) FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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4) FCC Radiation Exposure Statement :

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

6.2. IC Statement

1) Innovation, Science and Economic Development Canada Certification Statement

This device complies with Innovation, Science and Economic Development Canada Certification 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.

2) Innovation, Science and Economic Development Canada Certification Radiation Exposure Statement (Déclaration d'exposition aux radiations):

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

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

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7. <Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual v01>

List of applicable FCC rules

This module has been granted modular approval as below listed FCC rule parts.

-FCC Rule parts 15C (15.247)

Summarize the specific operational use conditions

-The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed in 2.7 in this instruction manual.

RF exposure considerations

The module has been certified for integration into products only by OEM integrators under the following condition:

-The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

-The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

-Mobile use

As long as the three conditions above are met, further transmitter testing will not be required.

OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas list

This module is certified with the following integrated antenna.

Antenna Type	Antenna Model	Gain(dBi)
		2405MHz ~ 2480MHz
IFA Antenna	MAHA300	2.13 dBi

Any new antenna type, higher gain than listed antenna should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

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Label and compliance information End Product Labeling

The module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: 2BMIG-INTNODEHP" "Contains IC: 33375-INTNODEHP"

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.