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## Instruction Manual

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# Wireless Monitoring System

TYPE : NRA30201-YYYYY-S (Wireless Remote Unit)

NRA50201-YYYYY-S (Wireless Base Unit)

NRA40201-YYYYY-S (Dosemeter attachment)

HS98-1-243

N1

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# Introduction

Thank you for purchasing the Wireless Monitoring System made by Fuji Electric Systems Co., Ltd.

Please make sure that you read this “Instruction Manual” carefully before operation.

## Symbol explanation




.....Attention/Warning



.....Prohibition

## HANDLING PRECAUTIONS

	PRECAUTIONS
 <b>Attention</b>	<ul style="list-style-type: none"><li>• Do not place the equipment and metal objects in the same pocket.</li><li>• Keep the equipment in a plastic bag, etc. beforehand when operating in such an environment where organic solvents, plashes/steam, full of or dust and wastes are present.</li><li>• Do not touch the body with wetted hands due to water, etc. or dirty hands.</li><li>• Do not drop the equipment or subject it to high impact.</li><li>• Avoid operating in high dose rate atmosphere that the exposure dose in free space is over 2Sv/h.</li><li>• Avoid operating in any environments generate high frequency noise or have magnetic flux density of over 200 gauss.</li><li>• Do not place the equipment and PHS or mobile phone in the same pocket.</li><li>• Do not disassemble the equipment except for battery replacement.</li><li>• Do not put the battery in fire or disassemble it.</li><li>• Do not touch directly to the power source terminal inside the equipment. Perform maintenance with turning " OFF" power.</li><li>• Wireless Remote Unit and Wireless Base Unit used for this equipment are equipped with FCC wireless machine. Do not open or close the equipment. Data on the report of the wireless machine that is obtained before shipment (when obtaining Technical Regulation Conformity Certification seal) may be greatly changed.</li></ul>

# 1. General

This equipment is designed to provide real-time transmission of data such as dose level in high dose areas of nuclear power plants, etc. to an operation supervisor so that a supervisor may control personal dose and workers may be prevented from radiation overexposure. The main function of this system is as follows;

(1) Communication function

Data of the Dosimeter is transmitted to the Wireless Base Unit and PC for the Monitoring Equipment by combining Dosemeter, Dosemeter Attachment, and Wireless Remote Unit.

(2) Data monitoring/indicating function

The equipment transmits dose data of 50 Dosemeters per 1 Wireless Base Unit that is transmitted from Wireless Base Unit to PC for Monitoring Equipment.

(3) Abnormality notification function

The equipment notifies abnormality of Dosemeter and radio transmission.

<Reference>

Electronic personal Dosemeter (for gamma(X)-ray) (NRF30)

Instruction Manual (in English) TN514629

Electronic personal Dosemeter (for gamma(X)-ray and neutron) (NRF31)

Instruction Manual (in English) TN5A0220

 <b>Attention</b>
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PC software for the Monitoring Equipment is nonstandard. Please create software according to “5.2、5.4 Communication between Monitoring Equipment and Wireless Base Unit” .
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## 2. Dosemeter specification and external

### 2.1 Wireless remote unit Specification

No	Item	Content
1	Wireless communication method	FCC Part15.249
2	Modulation method	F1D 2-value modulation
3	Power source	DC3.0V Within $\pm 3\%$ (supplied from power source of Dosemeter Attachment)
4	Interface	Special interface to the Attachment
5	Antenna	Internal antenna
6	Communication accessing distance to Wireless Base Unit	Outside forecast Approx. 100m ※Communication accessing distance will be shortened if there are any obstacles affects the radio transmission.
7	Operating temperature	0 to 40°C(No condensation)
8	Dimensions	Approx. 50.4mm (L) × 24mm (H) × 17.8mm (W)
9	Weight	Approx. 13g

### 2.2 Wireless remote unit External



Figure 2-1 External

- ① Serial communication connector
- ② Name plate
  - Corporate name (Fe)
  - Wireless remote unit type
  - Serial No.
  - Version No. (hard/soft)
  - FCC ID

 Attention

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.

### 2.3 Wireless base unit Specification

No	Item	Content
1	Wireless communication method	FCC Part15. 249
2	Modulation method	F1D 2-value modulation
3	Power source	DC 5.0V
4	Interface	RS-232C
5	Antenna	180° Tilting antenna
6	Communication accessing distance to Wireless Base Unit	Outside forecast Approx. 100m ※Communication accessing distance will be shortened if there are any obstacles affects the radio transmission.
7	Operating temperature	0 to 40°C (No condensation)
8	Dimensions	Approx. 152mm (L) × 26mm (H) × 84mm (W) (The height excludes prongs of antenna.)
9	Weight	Approx. 360g

### 2.4 Wireless base unit External

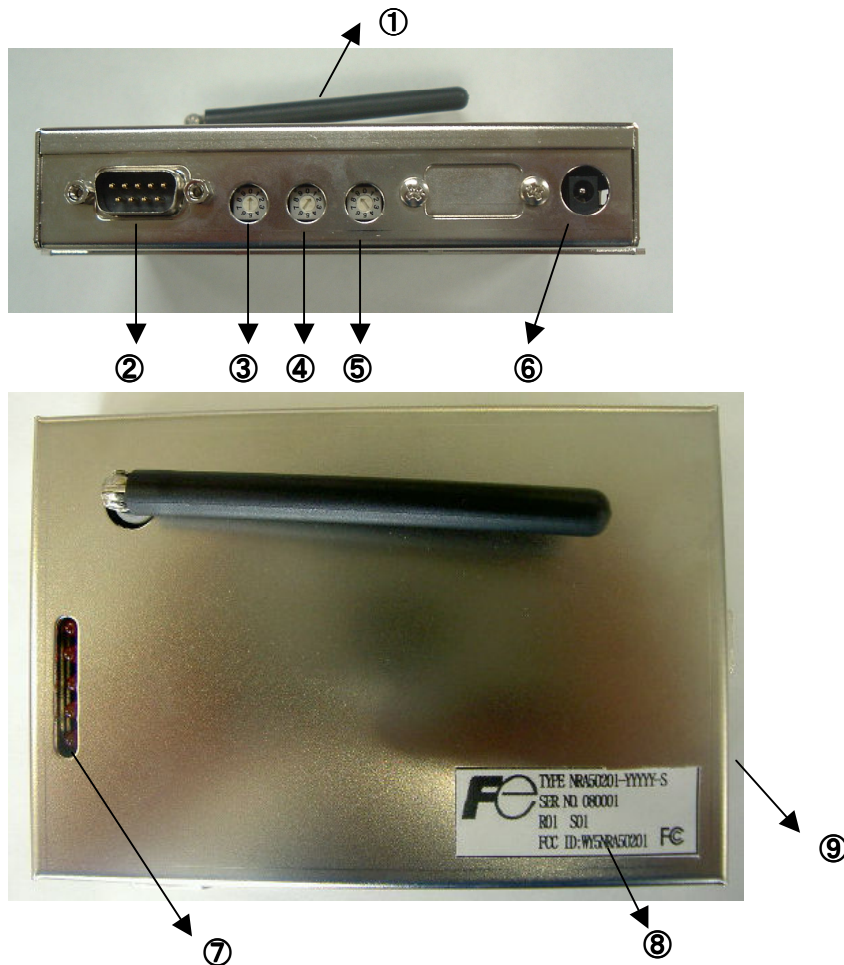




Figure 2-2 External

- ① 180° Tilting antenna
- ② Connector for RS-232C
- ③ Dial SW1 (unused item)
- ④ Dial SW2 (1 : registration/0 : monitoring)
- ⑤ Dial SW3 (switches 10ch)
- ⑥ Power Jack (DC 5.0V)
- ⑦ Send/Receive LED : It lights when sending/receiving radio transmission to Wireless Remote Unit and activating power.
- ⑧ Name plate
  - Corporate name (Fe)
  - Wireless base unit type
  - Serial No.
  - Version No. (hard/soft)
  - FCC ID
  - FCC Label
- ⑨ Power source SW (side)
- ⑩ FCC Regulation

## 2.5 Dosemeter Attachment Specification

No	Item	Content
1	Communication method	Infrared communication
2	Power source	Rechargeable Ni-H battery (min. 750mAh/AAA)
3	Interface	Special interface to Wireless remote unit
4	Continuous operating time	Approx. 15 hr (for full charge)
5	Operating temperature	0 to 40°C (No condensation)
6	Dimensions	Approx. 56mm (L) × 66.3mm (H) × 29mm (W)
7	Weight	Approx. 35g

## 2.6 Dosemeter Attachment External

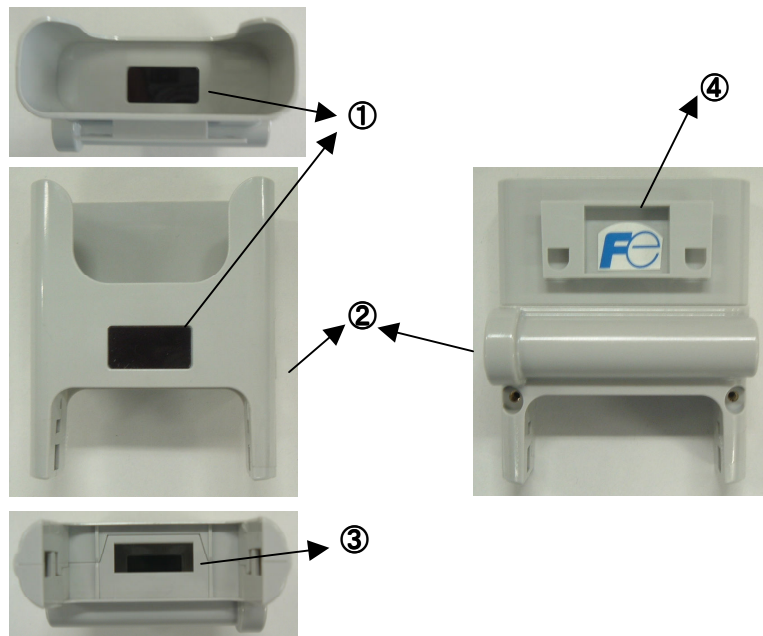


Figure 2-3 External

- ① Infrared communication interface
- ② Battery insertion opening (side)
- ③ Serial communication interface
- ④ Name plate

## 2.7 Dosemeter specification and External

See the reference.



## 2.8 Dosemeter + Dosemeter attachment + Wireless remote unit

Communication with Wireless base unit can be performed by combining Dosemeter, Dosemeter Attachment, and Wireless remote unit.

(Communication can't be performed unless they all are arranged.)

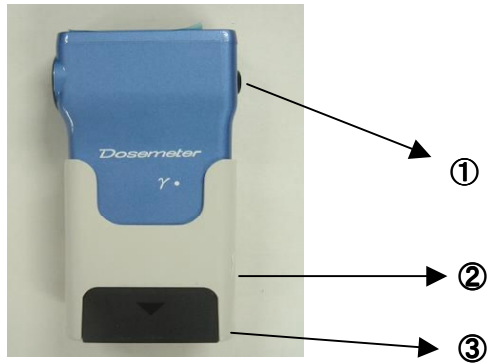


Figure 2-4 Combination of the devices

- ① Dosemeter
- ② Dosemeter attachment
- ③ Wireless remote unit

Hooks are fixed to the Dosemeter and Attachment to prevent the Dosemeter from detaching when moving it, etc.

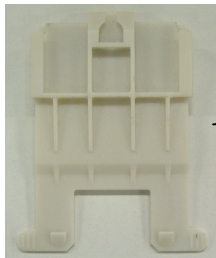


Figure 2-5 Hooks for Dosemeter and Attachment

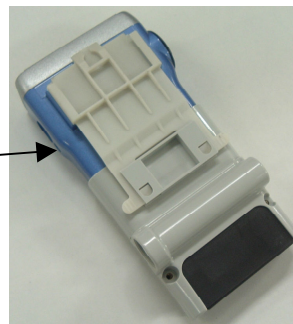


Figure 2-6 Devices fixed with hooks

## 2.9 Monitoring Equipment PC and PC for registration (nonstandard)

No	Item	Content
1	Type	General-purpose desktop PC (Laptop PC is also available.)
2	Memory	over 1GB (512MB×2)
3	Auxiliary storage	over HDD 80GB
4	Power source	AC100V 50Hz/60Hz, 2 power system with internal battery
5	Communication to Wireless Base Unit	Serial communication[RS-232C/D-SUB/9PIN] (TCP/IP communication is available with universal protocol converter when more than one Wireless Base Units are used.)

### 3. FCC radio transmission

#### 3.1 Specification

No	Item	Content
1	Wireless communication method	FCC Part15.249
2	Line type	2 frequencies simplex operation
3	Wireless frequency	915MHz band 912.000 MHz to 917.850 MHz 150kHz Interval Transmission : 20channel、Reception : 20channel
4	Modulation method	F1D 2-value modulation
5	Aerial power	Within 93.9dB $\mu$ V/m(RSSI in distance 3m)
6	Transmission frequency deviation	Within 4ppm
7	Spurious Radiation	Within 54dB $\mu$ V/m
8	Transmission speed	19200Bps
9	Synchronization method	Specific character synchronization

#### 3.2 Frequency

20ch-frequency is available. Frequency varies from used mode.

Two modes of monitoring mode and registration mode are available. Frequencies are as follows.

• monitoring mode

Dial SW2 of Wireless base unit	Dial SW3 of Wireless base unit	Transmitted frequency of Wireless base unit Received frequency of Wireless remote unit	Received frequency of Wireless base unit Transmitted frequency of Wireless remote unit
0	0	1ch (915.000MHz)	1ch (913.500MHz)
	1	2ch (915.150MHz)	2ch (913.650MHz)
	2	3ch (915.300MHz)	3ch (913.800MHz)
	3	4ch (915.450MHz)	4ch (913.950MHz)
	4	5ch (915.600MHz)	5ch (914.100MHz)
	5	6ch (915.750MHz)	6ch (914.250MHz)
	6	7ch (915.900MHz)	7ch (914.400MHz)
	7	8ch (916.050MHz)	8ch (914.550MHz)
	8	9ch (916.200MHz)	9ch (914.700MHz)
	9	10ch (916.350MHz)	10ch (914.850MHz)

• registration mode

Dial SW2 of Wireless base unit	Dial SW3 of Wireless base unit	Transmitted frequency of Wireless base unit Received frequency of Wireless remote unit	Received frequency of Wireless base unit Transmitted frequency of Wireless remote unit
1	0	11ch (916. 500MHz)	11ch (912. 000MHz)
	1	12ch (916. 650MHz)	12ch (912. 150MHz)
	2	13ch (916. 800MHz)	13ch (912. 300MHz)
	3	14ch (916. 950MHz)	14ch (912. 450MHz)
	4	15ch (917. 100MHz)	15ch (912. 600MHz)
	5	16ch (917. 250MHz)	16ch (912. 750MHz)
	6	17ch (917. 400MHz)	17ch (912. 900MHz)
	7	18ch (917. 550MHz)	18ch (913. 050MHz)
	8	19ch (917. 700MHz)	19ch (913. 200MHz)
	9	20ch (917. 850MHz)	20ch (913. 350MHz)

 Attention

- 1) There are 2 kinds of ch settings (for registration and monitoring). Wireless Remote Unit changes to registration mode when activating power and doesn't change to monitoring mode unless it goes into registration status.
- 2) Maximum 25-Wireless base unit is available. Detach the Wireless base units for the same ch completely. (Wireless communication can't be performed if the communication area of Wireless base unit for the same ch is overlapped.)

## 4. Composition

Entire composition is as the diagram below indicates.

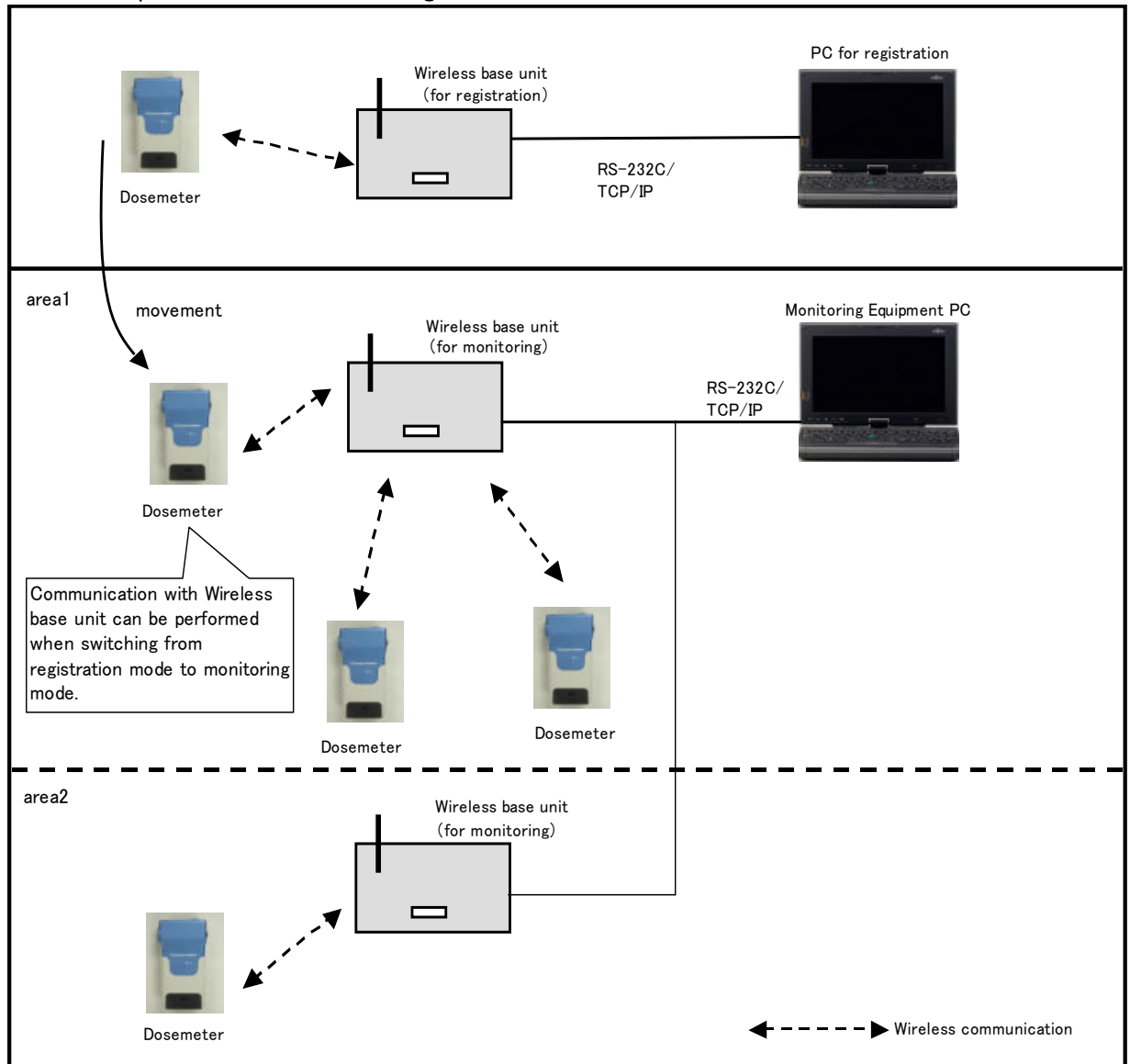


Figure 4-1 Entire composition

Part name	Specification	Remarks
Wireless remote unit	1) Monitoring mode <ul style="list-style-type: none"> <li>• Checks the frequency periodically and checks if the Wireless base unit is used.</li> <li>• Responds to required Wireless base unit (Responds to the stronger unit, when a number of Wireless base units are used) .</li> <li>• Subsequently performs wireless communication with the Wireless base unit.</li> </ul> 2) Registration mode <ul style="list-style-type: none"> <li>• Checks the frequency periodically and checks if the Wireless base unit is used.</li> <li>• Responds to required Wireless base unit.</li> <li>• Switches from registration mode to monitoring mode.</li> </ul> 3) Communication with Dosemeter <ul style="list-style-type: none"> <li>• Outputs requirement to Dosemeter regularly and receives the dosemeter data.</li> </ul>	Switches to registration mode when activating power.
Wireless base unit	1) Monitoring mode <ul style="list-style-type: none"> <li>• Connection of maximum 25-unit/1 PC for monitoring equipment is available.</li> <li>• Data collection of maximum 25-unit /1 Wireless base unit is available (Requires 3 times/min).</li> </ul> 2) Registration mode <ul style="list-style-type: none"> <li>• Performs one-on-one communication with PC for registration.</li> <li>• Performs one-on-one communication with Wireless remote unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency ch setting of 10ch for registration and 10ch for monitoring is available. (Frequency setting must not be overlapped in communication range.)</li> </ul>
Attachment	Relay unit for the dosemeter data of Wireless remote unit and Dosemeter.	Same quantity as Wireless remote unit and Dosemeter.
Dosemeter	See the reference.	Same quantity as Wireless remote unit and Attachment.
PC for monitoring equipment	Monitoring Equipment for dosemeter data <ul style="list-style-type: none"> <li>• Sets the associated Wireless base unit.</li> <li>• Outputs start requirement for the set Wireless base unit.</li> <li>• Outputs monitoring request 1 time/min to the set Wireless base unit.</li> <li>• Displays and stores the received data from Wireless base unit.</li> <li>• Outputs stop requirement for the set Wireless base unit upon termination.</li> </ul>	Application software is nonstandard.
PC for registration	Registration unit for Dosemeter and Wireless remote unit <ul style="list-style-type: none"> <li>• Sets the associated Wireless base unit.</li> <li>• Requires data for the set Wireless base unit.</li> <li>• Displays the received data from Wireless base unit.</li> </ul>	—

## 4.1 Equipment installation and cable connection

Connection is as follows:

- Connect PC for registration with Wireless base unit (Set registration frequency) .
- Connect PC for monitoring equipment with Wireless base unit (Set monitoring frequency).
- Connect Dosemeter, Dosemeter attachment, and Wireless remote unit.

### Attention

Abnormalities in wireless communication may be caused if there are any objects near the equipment that can affect radio transmission such as metallic plates. Install Wireless Base Unit in the most conspicuous possible place and avoid putting such an object in work area.

## 4.2 Start-up procedure

### 4.2.1 Dosemeter

Insert batteries into Dosemeter or remove the plug pins for ON/OFF of power, and then turn "ON" power.

Insert batteries into Attachment, and then turn "ON" power.

### 4.2.2 Dosemeter attachment

Insert batteries into Attachment, and then turn "ON" power.

### 4.2.3 Wireless remote unit

Equip Attachment with Wireless remote unit.

### 4.2.4 Dosemeter-attachment hook

Fix hooks on Dosemeter and Attachment.

### 4.2.5 Wireless base unit

Turn "ON" the lateral power switch.

## 5. Outline of operation

### 5.1 Registration mode

“Dosemeter+Attachment+Wireless remote unit” switches to registration mode when turning “ON” power of Wireless remote unit (Wireless remote unit starts communicating with Dosemeter periodically when turning “ON” power).

Performs one-on-one communication by the following procedure with PC for registration and Wireless base unit for registration. Wireless remote unit switches from registration mode to monitoring mode after the communication.

(Set registration frequency for Wireless base unit. For frequency list, see 3.2.)

- 1) PC for registration performs entry processing by infrared communication of Dosemeter.  
(For entry processing, see the reference of Dosemeter.)
- 2) PC for registration requires Wireless base unit for wireless communication.  
(Wireless communication software is nonstandard. For communication, see 5.2.)
- 3) Received data is returned to PC for registration by communication of Wireless base unit and Wireless remote unit.
- 4) PC for registration completes the processing by infrared communication with Dosemeter.
- 5) The completion is received by periodic communication of Dosemeter and Wireless remote unit, and then its mode is switched from registration mode to monitoring mode.

#### Attention

Turn on and off power of Attachment or replace Dosemeter to change into registration mode, once Wireless remote unit is in monitoring mode.

### 5.2 Registration mode communication specification

Communication between PC for registration and Wireless base unit

• Data requirement (PC for registration→Wireless Base Unit)

STX	DFM B5	Repeater num.	Dosemeter num.	ETX	BCC
1chr	2chr	6chr	6chr	1chr	1chr

#### Attention

Designate Serial No. for Wireless base unit No.

Designate Dosemeter No. to be registered for Dosemeter No.



• Data response (Wireless Base Unit→PC for registration)

STX	DFM B0	Repeater num.	Repeater error information	Number of Dosemeter data	data 1	...	data 150	Setting ch	ETX	BCC
1chr	2chr	6chr	1chr	2chr	52chr		52chr	1chr	1chr	1chr

Breakout of data

Dosemeter num.	Dose type of Dosemeter	Dosemeter error info.	Accumulated dose of gamma	Accumulated dose of beta	Accumulated dose of fast neutron	Accumulated dose of thermal neutron	RSSI
6chr	2chr	2chr	10chr	10chr	10chr	10chr	2chr

Repeater error information : Error information of a repeater is indicated as bitmaps.

The contents are allotted in 8 bit and indicated with a wireless code.

MSB	LSB						
B7	B6	B5	B4	B3	B2	B1	B0

B7-B1 : unused item

B0 : Abnormal RFIC (0 : normal, 1 : abnormal)

Number of Dosimeter data : max 150/1Wireless base unit

(1 Wireless base unit can collect 50-unit dose data, but 150-minute range is prepared, because it retries for two times. Consequently, Dosimeter No. may be overlapped.)

Setting ch : ch set with Dial SW3 (0 to 9)

Breakout of data : Data from Dosimeter

Dose type of Dosimeter : 0 NRF30(gamma only)

2 NRF31(gamma + fast neutron + thermal neutron)

Repeater error information : Error information of a repeater is indicated as bitmaps.

The contents are allotted in 8 bit and indicated with a wireless code.

MSB	LSB						
B7	B6	B5	B4	B3	B2	B1	B0

B7 : Abnormal CRC (0 : normal, 1 : abnormal)

B6 : Abnormal Dosimeter num. (0 : normal, 1 : abnormal)

B5 : Abnormal frame synchronization (0 : normal, 1 : abnormal)

B4 : No Wireless remote unit response (0 : normal, 1 : abnormal)

B3 : Low battery voltage of Dosimeter Attachment (0 : normal, 1 : abnormal)

B2 : unused item

B1 : Abnormal Dosimeter data format (0 : normal, 1 : abnormal)

B0 : No Dosimeter response (0 : normal, 1 : abnormal)

RSSI : RSSI when Wireless base unit receives through radio transmission (00toFFh)

 Attention

The decimal point is the last 5 digits for 10 digits of the accumulated dose. Beware when displaying and storing.

 Attention

Display and store the amount of accumulated dose of fast neutron and thermal neutron for accumulated dose of neutron.

 Attention

Accumulated dose of beta-ray is treated as preliminary data. Data will be sent as “999999999” from Wireless base unit for registration to PC for registration.  
Two-type neutron is also treated as preliminary and data will be sent as “999999999”, when the dose type of Dosimeter is NRF30 (only gamma-ray).  
All the accumulated dose will be sent as “999999999” for abnormal communication, etc.  
(Refer gamma-ray and judge.)

### 5.3 Monitoring mode

Data requirement can be received from Wireless base unit for monitoring by switching Wireless remote unit into monitoring mode.

Performs communication by the following procedure with PC for monitoring equipment and Wireless base unit for monitoring.

(Set monitoring frequency for Wireless base unit. For frequency list, see 3.2.)

- 1) Require to start from PC for monitoring equipment to the associated Wireless base unit.  
(Wireless communication software is nonstandard. For communication, see 5.4.)
- 2) Wireless base unit received the start requirement requires 1time/20sec for the wireless communication area.
- 3) Random Wireless remote unit in the area returns to Wireless base unit.
- 4) Wireless base unit received return requires dosimeter data for Wireless remote unit.
- 5) Wireless remote unit received requirement returns dosimeter data to Wireless base unit.
- 6) Wireless base unit stores the dosimeter data.

 Attention

1 Wireless base unit can collect maximum 50-unit dose data of Wireless remote unit. Collection can't be performed even if there are more than 50 Wireless remote units in the area.

- 7) PC for monitoring equipment requires monitoring 1 time/1 sec. and receives the dosimeter data from Wireless base unit. (For communication, see 5.4. Time for monitor request is recommended when the time of this PC is 00 sec.)

 **Attention**

Dosimeter data of maximum 150-unit is transmitted to PC for monitoring equipment, because 1 Wireless base unit communicates with maximum 50-unit of Wireless remote unit for 3 times/min. (Data of the same Dosimeter No. may be transmitted for maximum 3 times when retrying after communication error, etc.)  
Check Dosimeter No., display and store the normal data with PC for monitoring equipment.

- 8) Require from PC for monitoring equipment to Wireless base unit to stop monitoring. Wireless base unit will be deactivated.  
(Remove batteries of the Attachment, because the Wireless remote unit is activated.)

 **Attention**

When Wireless remote unit receives requirement from a number of Wireless base units, it judges the field strength and responds for strong Wireless base unit. (nonselective)

 **Attention**

Data won't be returned even for monitor request shortly after the start request from PC for monitoring equipment, because Wireless base unit hasn't collected data yet. Wait for 1 minute after the start request or discard the first monitor request.

#### 5.4 Monitoring mode communication specification

Communication between Monitoring Equipment PC and Wireless base unit

- Requirement for start of collection (Monitoring Equipment PC→Wireless base unit)

STX	DFM B3	Repeater num.	Start/ Stop	ETX	BCC
1chr	2chr	6chr	2chr	1chr	1chr

START/STOP : 00 START

~~01 STOP~~

 **Attention**

Designate serial No. for Wireless base unit No.  
Require the used Wireless base unit to start, when a number of Wireless base units are used. (same as the following communication)

- Response for start of collection (Wireless base unit→Monitoring Equipment PC)

STX	DFM B3	Repeater num.	Start/ Stop	ETX	BCC
1chr	2chr	6chr	2chr	1chr	1chr

START/STOP : 00 START

~~01 STOP~~

- Requirement for stop of collection (Monitoring Equipment PC→Wireless base unit)

STX	DFM B3	Repeater num.	Start/ Stop	ETX	BCC
1chr	2chr	6chr	2chr	1chr	1chr

START/STOP : ~~00 START~~

01 STOP

- Response for stop of collection (Wireless base unit→Monitoring Equipment PC)

STX	DFM B3	Repeater num.	Start/ Stop	ETX	BCC
1chr	2chr	6chr	2chr	1chr	1chr

START/STOP : ~~00 START~~

01 STOP

- Data requirement (Monitoring Equipment PC→Wireless base unit)

STX	DFM B0	Repeater num.	ETX	BCC
1chr	2chr	6chr	1chr	1chr

- Data response (Wireless base unit→Monitoring Equipment PC)

STX	DFM B0	Repeater num.	Repeater error information	Number of Dosimeter data	data 1	· · ·	data 150	Setting ch	ETX	BCC
1chr	2chr	6chr	1chr	2chr	52chr		52chr	1chr	1chr	1chr

Breakout of data

Dosimeter num.	Dose type of Dosimeter	Dosimeter error info.	Accumulated dose of gamma	Accumulated dose of beta	Accumulated dose of fast neutron	Accumulated dose of thermal neutron	RSSI
6chr	2chr	2chr	10chr	10chr	10chr	10chr	2chr

Repeater error information : Error information of a repeater is indicated as bitmaps.

The contents are allotted in 8 bit and indicated with a wireless code.

MSB									LSB
	B7	B6	B5	B4	B3	B2	B1	B0	

B7-B1 : unused item

B0 : Abnormal RFIC (0 : normal, 1 : abnormal)

Number of Dosimeter data: max 150/1Wireless base unit

(1 Wireless base unit can collect 50-unit dose data, but 150-minute range is prepared, because it retries for two times. Consequently, Dosimeter No. may be overlapped.)

Setting ch: ch set with Dial SW3 (0 to 9)

Breakout of data : Data from Dosimeter

Dose type of Dosimeter: 0 NRF30 (gamma only)

2 NRF31 (gamma + fast neutron + thermal neutron)

Repeater error information : Error information of a repeater is indicated as bitmaps.

The contents are allotted in 8 bit and indicated with a wireless code.

MSB									LSB
	B7	B6	B5	B4	B3	B2	B1	B0	

B7 : Abnormal CRC (0 : normal, 1 : abnormal)

B6 : Abnormal Dosimeter num. (0 : normal, 1 : abnormal)

B5 : Abnormal frame synchronization (0 : normal, 1 : abnormal)

B4 : No Wireless remote unit response (0 : normal, 1 : abnormal)

B3 : Low battery voltage of Dosimeter Attachment (0 : normal, 1 : abnormal)

B2 : unused item

B1 : Abnormal Dosimeter data format (0 : normal, 1 : abnormal)

B0 : No Dosimeter response (0 : normal, 1 : abnormal)


RSSI : RSSI when Wireless base unit receives through radio transmission (00toFFh)

### Attention

The decimal point is the last 5 digits for 10 digits of the accumulated dose. Beware when displaying and storing.

### Attention

Display and store the amount of accumulated dose of fast neutron and thermal neutron for accumulated dose of neutron.

 Attention


Accumulated dose of beta-ray is treated as preliminary data. Data will be sent as “9999999999” from Wireless base unit for registration to PC for registration.

Two-type neutron is also treated as preliminary and data will be sent as “9999999999”, when the dose type of Dosemeter is NRF30 (only gamma-ray).

All the accumulated dose will be sent as “9999999999” for abnormal communication, etc.  
(Refer gamma-ray and judge.)

 Attention

For the value of field strength, received value by Wireless base unit is output even for abnormal wireless communication. Refer if wireless communication can't be performed. (The lower field strength, the worse wireless environment.)

 Attention

Please create the error indication such as abnormal wireless communication with application software (nonstandard).

## 6. Troubleshooting

### (1) Wireless remote unit

Symptom	Suggested solution
PC for Monitoring Equipment/registration is notified of "Low battery voltage" .	Recharge battery of Dosemeter Attachment immediately.
PC for Monitoring Equipment/registration is frequently notified of "No Dosimeter response" .	Infrared communication may be abnormal. Insert and remove the Dosimeter, and retry. If trouble continues after this procedure, contact our branch office.
Abnormal wireless communication	<p>① This abnormality will also occur after low battery voltage of Dosimeter Attachment. Check the battery.</p> <p>② Check if the Wireless Base Unit is tuned on.</p> <p>③ Check that the distance between Wireless Remote Unit and Wireless Base Unit is within 100m.</p> <p>④ if it occurs frequently, contact our branch office.</p>

### (2) Wireless base unit

Symptom	Suggested solution
Power source doesn't work (No indication on LED)	Check the wiring of power source cable. If it isn't powered on even after this procedure, the internal circuit may be broken. Contact our branch office.

## 7. Replacement part list

Relevant point	Part name	Type	Manufacturer	Q' ty	Replacement rank
Dosemeter Attachment	Nickel hydride battery	HR-4UTG	SANYO Electric Co., Ltd.	1/1unit	A

\* Implement annual inspection.

A : It needs to be replaced.

B : Judge if it needs replacement at inspection.

C : It hardly need to be replaced.

## 8. Accessory list

Relevant point	Accessory name	Type/Manufacturer	Q' ty	Remarks
Wireless base unit	AC adapter (DC 5.0V OUTPUT)	GP051U-0501 A044-208/TOYO SANGYO LTD.	1set/ 1unit	Accessory
	Power cable (approx. 30m, with drum)	—	1set/ 1unit	Accessory
	Communication cable (approx. 30m, with drum)	—	1set/ 1unit	Accessory

If additional accessories are required, contact our branch office.



## Appendix.

### Appendix.1 FCC Part15B ClassB 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 WARNING

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

## Appendix.2 FCC/Declaration of Conformity (DoC)

### 1) Device name, Model Number

- Wireless base unit(FCC ID WY5NRA50201)

### 2) Trade Name



### 3) Responsibility ground

- Responsible party : FECOA Houston Office
- Address : 11200 Westheimer Suite 509  
Houston TX 77042
- Telephone number : 713-789-8322

Regulated document
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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.
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★ Your Comment ★

Dear customers,

Please feel free to contact us by filling out this form and give to our representative if you have any comments/ requests/ suggestions regarding our instruction manual.

Document #	TN5A0736
Name of manual	Instruction Manual of Wireless Monitoring System

Date (DD/MM/YY)	
Submitted by	Company/Agency
	Department/Section
	Your name

Page	Line	Details
		Comments, requests, questions (error, more info needed, terminology not consistent, typos, etc.) ..... Circle the appropriate item.

Received by	Manufac -turer		Received date (DD/MM/YY)		Receipt #	
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