PATLITE®

Network Monitor Signal Tower with MP3
NH-FV Series

Instruction Manual

-Microsoft Azure Procedures-

Supported models
- ## *NHL-FV2*
- ## *NHP-FV2*
  - *NHL-FV1*

Supported firmware
 Ver 1.12 or higher

Notice to Customer

Thank for your purchasing our PATLITE products. This document provides instructions for using Microsoft Azure to operate the NH-FV series. For installation and basic usage, refer to the "NH-FV Series User's Manual".

● Before using this product, read this manual and the "NH-FV Series User's Manual" thoroughly to ensure correct use.

● Microsoft Azure is a cloud platform provided by Microsoft. Operate only after confirming with personnel with a good understanding of Azure. Additionally, if you have any technical questions about Azure, please contact Microsoft.

● If you have any questions, please contact our service and repair desk.

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1. Before you begin

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1.1 About Safety Symbols

● The following symbols classify warnings and cautions, and describe the level of harm and damage that will occur when the corresponding instructions are ignored.

⚠ **WARNING**	This symbol indicates, "Failure to follow the instructions may lead to death or serious injury."
⚠ **CAUTION**	This symbol indicates, "Failure to follow the instructions may lead to injury or property damage."
🚫 **Prohibited**	This symbol identifies "Prohibited" operations that should never be carried out.
❗ **Mandatory**	This symbol identifies "Mandatory" instructions that should always be carried out.
Caution	This symbol identifies information that requires your attention at setup.
MEMO	This symbol identifies supplementary information.

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2. Starting operations

This chapter describes the operation process for using Microsoft Azure.

Operate while referring to this manual and the "NH-FV Series User's Manual".

2.1. Preparation

STEP **1**   Installing This Product

NH-FV Series User's Manual

"2.2. Product Installation"

STEP **2**   Wiring Terminals

NH-FV Series User's Manual

"2.3 Terminal Buss wiring"

STEP **3**   Connecting to LAN

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"2.4 LAN Connection"

STEP **4**   Connecting Line Out

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"2.5 Line Out Connection"

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"2.6 Power Connection"

STEP **6**   Check the firmware version that supports Microsoft Azure

This manual

"3. Firmware confirmation method"

STEP **7**   Microsoft Azure Device Registration

Register on the Microsoft Azure site.

2.2. Settings

STEP 1   Network Settings

NH-FV Series User's Manual

"2.7 Network Setup"

"2.8 Network Setup with DHCP Function"

STEP 2   Cloud Connection Settings
(Microsoft Azure)

This manual

"4.1. [Azure IoT Hub] Connection" (☞ page 8)

"4.2. [Azure IoT Central] Connection" (☞ page 9)

Caution   When the schedule function is enabled, it prevents connecting to the cloud.

STEP 3   Operation Settings

NH-FV Series User's Manual

"2.9 Operation Setup", "3 Functionality Details"

!   In the time settings, make sure you set the current time.

2.3. Operation

Using Device Twin

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"5.1. Using Device Twin" (☞ page 10)

Using Direct Method

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"5.2. Using Direct Method" (☞ page 10)

Using Device-to-cloud Message

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"5.3. Using Device-to-cloud Message" (☞ page 11)

Using Cloud-to-device Message

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"5.4. Using Cloud-to-device Message" (☞ page 12)

3. Firmware confirmation method

Check if the firmware supports Microsoft Azure. If the firmware is not supported version,update the firmware/

3.1. Firmware version confirmation method

1 Start a Web browser.

2 In the Web browser's address bar, enter the IP address* as set up on this product.

   * The factory default IP address is http://192.168.10.1/index.htm.

3 Enter the password* and log in.

   * The default password is patlite.

4 From the menu, click [Setup Menu] to expand the menu tree.

5 From the menu tree, click [System Configuration] to display the setting screen.

6 Check the version in the [Firmware Version]

   * If the version is 1.11 or lower, perform "3.2. Firmware update".
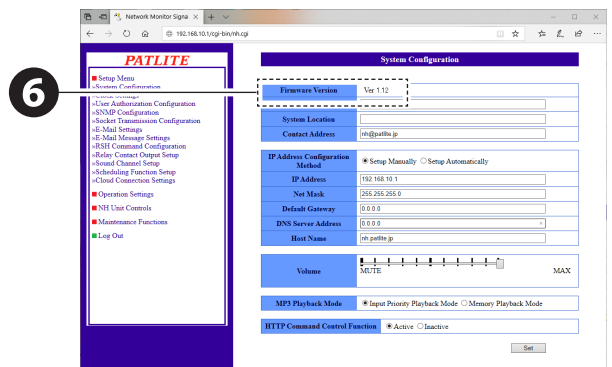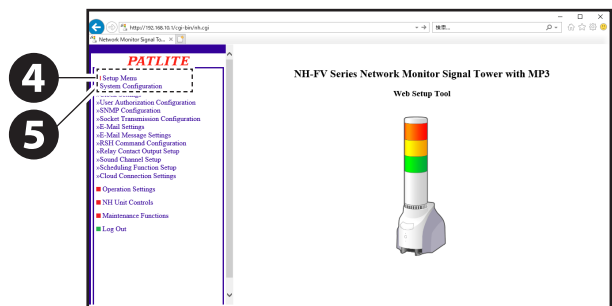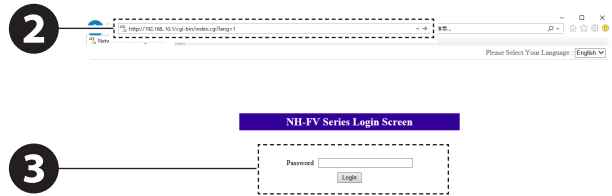
3.2. Firmware update

1

Start a Web browser.

2

From [https: //www.patlite.com], select [Products] [Network / wireless].

3

Select [Network Products].

4

Select [NHL-3FV2 / HHP-3FV2].

5

Select [File Downloads].

6

Download the firmware for NH-FV series (Ver1.12 or later).

7

Update the firmware.
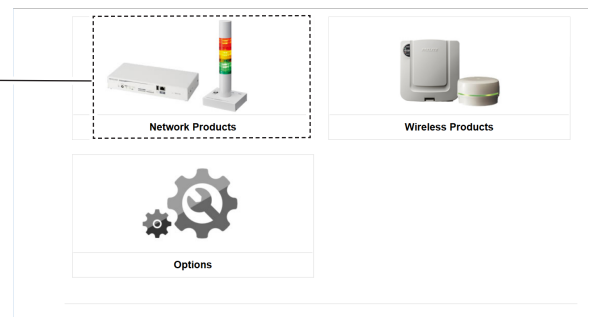
Operate while referring to the "NH-FV Series User's Manual".

NH-FV Series User's Manual

「3.24. Firmware Update Function」

4. Connection method

There are two connection methods: [Azure IoT Hub] and [Azure IoT Central]. Select a connection method and follow the steps below to make the connection.

4.1. [Azure IoT Hub] Connection

①

Start a Web browser.

②

In the Web browser's address bar, enter the IP address* as set up on this product.

* The factory default IP address is http://192.168.10.1/index.htm.

③

Enter the password* and log in.

*   The default password is patlite.

④

From the menu, click [Setup Menu] to expand the menu tree.

⑤

From the menu tree, click [Cloud Connection Settings] to display the setting screen.

⑥

In the [Connection Setting] field, enter the device connection string*.

* Get the value of the connection string from [Primary Connection String] on the Microsoft Azure IoT Hub site.

Caution: Leave the [Scope ID], [Device ID], and [SAS Token] fields empty. Otherwise you may not be able to connect properly.

⑦

Click [Set] to update with the defined settings.

Caution: Using the Config Setting function you cannot read or write values.

⑧

From the menu, click [Logout] and the browser closes.
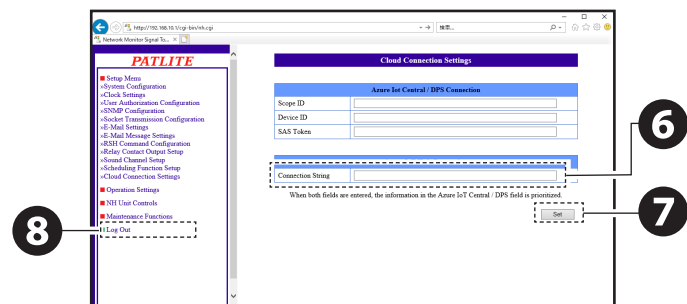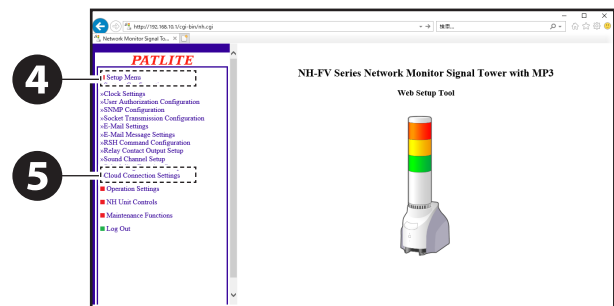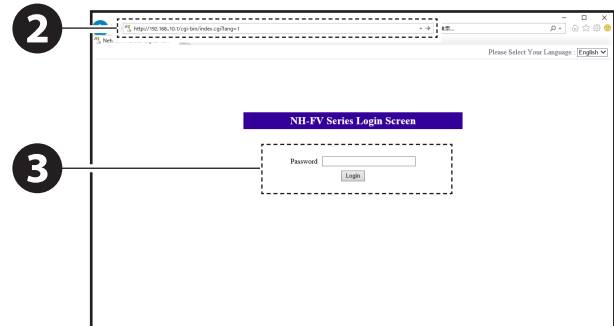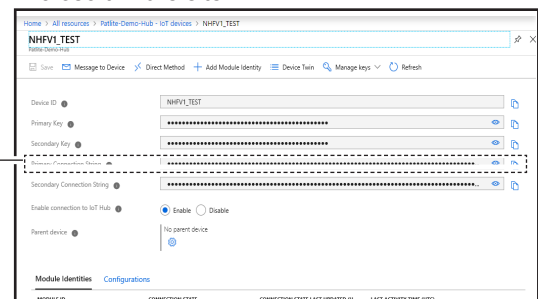
Microsoft Azure site

4.2. [Azure IoT Central] Connection

1 Start a Web browser.

2 In the Web browser's address bar, enter the IP address* as set up on this product.

* The factory default IP address is http://192.168.10.1/index.htm.

3 Enter the password* and log in.

* The default password is patlite.

4 From the menu, click [Setup Menu] to expand the menu tree.

5 From the menu tree, click [Cloud Connection Settings] to display the setting screen.
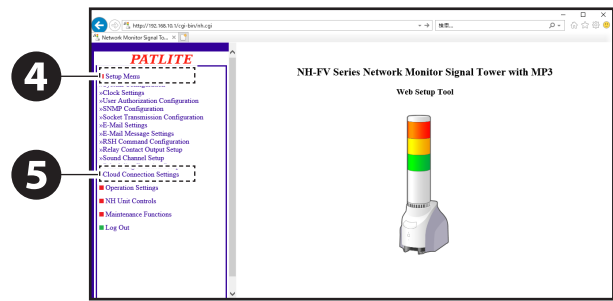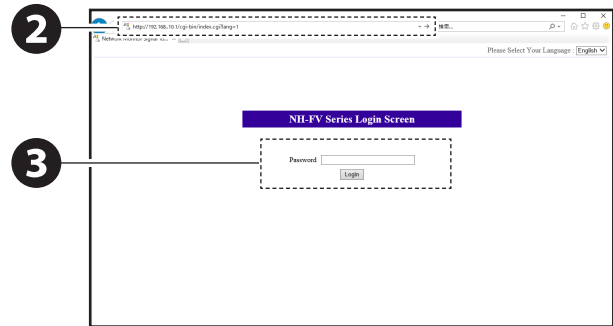
6 Enter values* for the [Scope ID], [Device ID], and [SAS Token].

* Get values for the Scope ID, Device ID, and SAS token (Primary Key) from [Device Connection] on the Microsoft Azure IoT Central site.

Caution: Leave the connection string blank. Otherwise you may not be able to connect properly.
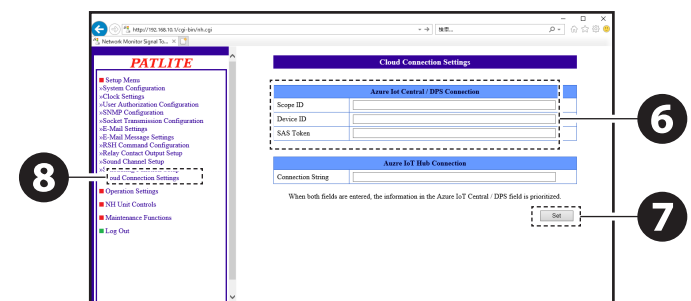
7 Click [Set] to update with the defined settings.

Caution: Using the Config Setting function you cannot read or write values.

8 From the menu tree, click [Logout] and the browser closes.

Microsoft Azure site
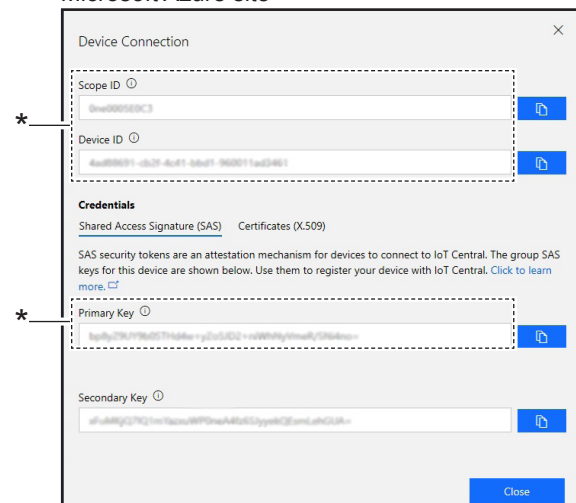
5. Operation

5.1. Using Device Twin

・Using Device Twin you can control this product and get its current status. Things you can control and information you can get are as follows.

・Do not control the buzzer output and audio channel at the same time.

Item	Field name*			
	Azure IoT Hub		Azure IoT Central	
	Status acquisition	Control	Status acquisition	Control
LED Unit (red)	led_red			led_red_c
LED Unit (yellow)	led_yellow			led_yellow_c
LED Unit (green)	led_green			led_green_c
LED Unit (blue)	led_blue			led_blue_c
LED Unit (white)	led_white			led_white_c
Buzzer output	buz_pattern			buz_pattern_c
Audio channel playback	sound_pattern			sound_pattern_c
Digital output	digital_output			digital_output_c

* For information about field names, refer to "7.1.　Device Twin fields" (☞ page 15)".

Example of control

●Turn on LED unit (red) → { "led_red":1}

●Turn off LED unit (red), emit buzzer pattern 2 → {"led_red":0,"buz_pattern":2}

5.2. Using Direct Method

・You can control this product using Direct Method. To enable control, enter "Method_Control□*" for the method name. Instructions you can control are as follows. *□:Any character

・To run multiple instructions, separate each instruction with a comma ",". Instructions are executed in order of priority, starting with 1. Instructions are not executed in the order that they are input.

・To execute [repeat], specify [sound] and [repeat].

・Do not specify [alert] and [sound] at the same time.

・If the same instruction is specified multiple times, that instruction will not execute.

Instruction	Field name*	Priority
Control LED unit and buzzer output	alert	1
Control LED unit	led	2
Control digital output	alert_do	2
Play specified audio channel	sound	2
Repeat playback the specified number of times (audio channel)	repeat	3
Turn off all LED units and stop the buzzer	clear	4

* For information about field names, refer to "7.2. Direct Method fields" (☞ page 15)".

Example of control

●To turn ON red and green and turn OFF yellow, blue, and white on the LED unit, and use buzzer pattern 2
→ { "alert":"101002"}

●Endlessly play on audio channel 1 → { "sound":1,"repeat":255}

5.3. Using Device-to-cloud Message

Using Device-to-cloud Message, notify status changes in this product.

No.	Field name*	Description
1	clear_switch	Notify when the Clear switch is pressed.
2	input_state_1	Notify when there is a change in state in digital input 1.
3	input_state_2	Notify when there is a change in state in digital input 2.
4	input_state_3	Notify when there is a change in state in digital input 3.
5	input_state_4	Notify when there is a change in state in digital input 4.
6	red_state	Notify when there is a change in state in the red LED.
7	yellow_state	Notify when there is a change in state in the yellow LED.
8	green_state	Notify when there is a change in state in the green LED.
9	blue_state	Notify when there is a change in state in the blue LED.
10	white_state	Notify when there is a change in state in the white LED.
11	buzzer_state	Notify when there is a change in state in the buzzer.
12	sound_state	Notify when there is a change in the audio channel.
13	output_state	Notify when there is a change in state in the digital output.

* For information about field names, refer to "7.3. Device-to-cloud Message fields" (☞ page 16)".

5.4. Using Cloud-to-device Message

・You can control this product using Cloud-to-device Message. Instructions you can control are as follows.

・If multiple instructions are specified, the instructions will not execute. Except when executing [repeat], both [sound] and [repeat] need to be specified. In that scenario, separate the instructions with a comma ",".

Instruction	Field name*
Control LED unit and buzzer output	alert
Control LED unit	led
Control digital output	alert_do
Turn off all LED units and stop the buzzer	clear
Play specified audio channel	sound
Repeat playback the specified number of times (audio channel)	repeat

*   For information about field names, refer to "7.4. Cloud-to-Device Message fields" (☞ page 17)".

Example of control

●On the LED unit, to turn ON red, flash yellow in pattern 2, no change to green, blue and white, and emit buzzer pattern 3
 → alert=129993

●Play audio channel 2 two times → sound=2,repeat=1

6. Functions

This chapter describes functions related to this product. For functions that are not described in this manual, refer to "3. Functionality Details" and "4. Function Setup" in the "NH-FV Series User's Manual".

6.1. Properties and Descriptions on the Cloud Connection Settings Screen
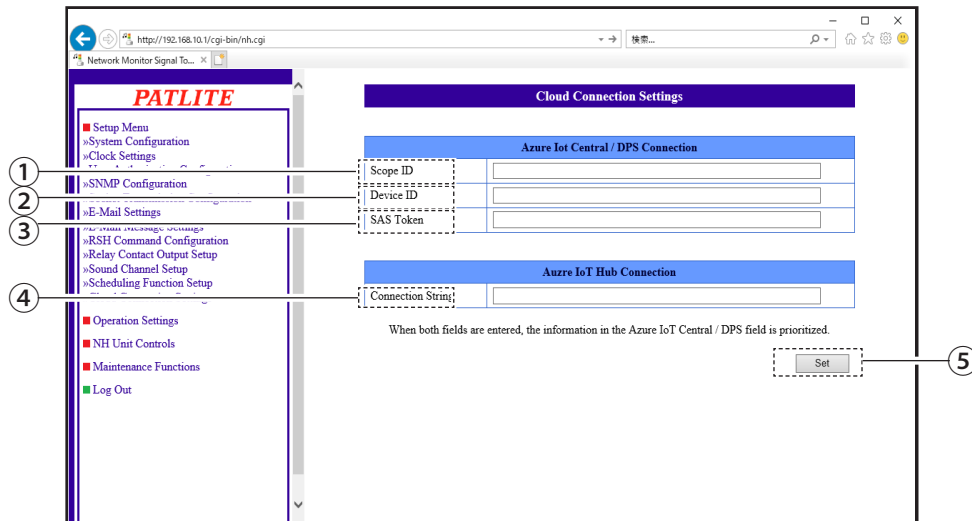
No.	Item	Description
①	Scope ID	Items required for [Azure IoT Central/DPS] connection
②	Device ID	
③	SAS Token	
④	Connection String	Items required for [Azure IoT Hub] connection
⑤	Set button	Button for applying the defined setting

6.2. About the Event Log Function

Names of the following Microsoft Azure events are displayed on the product's Event Log screen.

Event name	Event content	Event description
AZURE	CONNECT	Record when connecting to Azure.
	DISCONNECT	Record when closing the connection to Azure.
	CONTROL	Record when Azure operation is run.

6.3. About Initialization Functions

When using the initialization function*, the values of each cloud connection setting is as follows.

Item	Execution method				
	WEB Setup Tool			Mode Switch Functions	
	Network also reinitializes check box selected	Playlist data also initialized check box selected	Either Network or Playlist check box cleared	Initialize network setting only	Initialization mode
Cloud Connection Settings					
Scope ID	Default value (empty)	Default value (empty)	Default value (empty)	Save set value	Default value (empty)
Device ID	Default value (empty)	Default value (empty)	Default value (empty)	Save set value	Default value (empty)
SAS Token	Default value (empty)	Default value (empty)	Default value (empty)	Save set value	Default value (empty)
Connection string	Default value (empty)	Default value (empty)	Default value (empty)	Save set value	Default value (empty)

* For information about initialization methods refer to "3.17. Reinitialization Function" and "4.25. Reinitialization Screen" in the
  "NH-FV Series User's Manual".

7. Fields and descriptions

7.1. Device Twin fields

No.	Field name	Value		Description
1	led_red / led_red_c			LED Unit (red)
2	led_yellow / led_yellow_c		0: Light off 1: Light on	LED Unit (yellow)
3	led_green / led_green_c	0,1,2,3,9	2: Flashing 1	LED Unit (green)
4	led_blue / led_blue_c		3: Flashing 2 9: Maintenance (no change)	LED Unit (blue)
5	led_white / led_white_c			LED Unit (white)
6	buz_pattern / buz_pattern_c	0,1,2,3,4,9	0: Stop 1: Pattern 1 2: Pattern 2 3: Pattern 3 4: Pattern 4 9: Maintenance (no change)	Buzzer control
7	sound_pattern / sound_pattern_c	1 to 70	Channel 1 to 70	Audio channel
8	digital_output / digital_output_c	0,1	0: OFF, 1: ON	Digital output

Caution: This will not run if an invalid value is specified.

7.2. Direct Method fields

No.	Field name	Value	Description
1	alert	"6 digits"	• Controls the signal light and buzzer. • Set patterns in order: R (red) → Y (yellow) → G (green) → B (blue) → C (white) → Z (buzzer). • [RYGBC] - 0: light off, 1: light on, 2: flashing 1, 3: flashing 2, 9: no change • [Z] - 0: No sound, 1: Buzzer pattern 1, 2: Buzzer pattern 2, 3: Buzzer pattern 3, 4: Buzzer pattern 4, 9: No change
2	led	"5 digits"	• Controls the signal light. • Set patterns in order: R (red) → Y (yellow) → G (green) → B (blue) → C (white). • [RYGBC] - 0: light off, 1: light on, 2: flashing 1, 3: flashing 2, 9: no change
3	alert_do	0,1,9	• Controls digital output. • 0: OFF, 1: ON, 9: No operation
4	clear	1	Turn off all signal lights and stop playing the current channel.
5	sound	1 to 70	Play specified audio channel.
6	repeat*	0 to 255	Play the audio channel defined by the [sound] instruction the number of times specified here.

* Set a value of 255 for endless playback.

Caution: This will not run if an invalid value is specified.

7.3. Device-to-cloud Message fields

No.	Field name	Value	Description
1	clear_switch	"on"	Notify when the Clear switch is pressed.
2	input_state_1	"on"	Notify when digital input 1 turns ON.
		"off"	Notify when digital input 1 turns OFF.
3	input_state_2	"on"	Notify when digital input 2 turns ON.
		"off"	Notify when digital input 2 turns OFF.
4	input_state_3	"on"	Notify when digital input 3 turns ON.
		"off"	Notify when digital input 3 turns OFF.
5	input_state_4	"on"	Notify when digital input 4 turns ON.
		"off"	Notify when digital input 4 turns OFF.
6	red_state	"0"	Notify when the red LED unit turns off.
		"1"	Notify when the red LED unit turns on.
		"2"	Notify when the red LED unit flashes using pattern 1.
		"3"	Notify when the red LED unit flashes using pattern 2.
7	yellow_state	"0","1","2","3"	Notify when there is a change in state in the yellow LED unit. The values are the same as number 6 red_state.
8	green_state	"0","1","2","3"	Notify when there is a change in state in the green LED unit. The values are the same as number 6 red_state.
9	blue_state	"0","1","2","3"	Notify when there is a change in state in the blue LED unit. The values are the same as number 6 red_state.
10	white_state	"0","1","2","3"	Notify when there is a change in state in the white LED unit. The values are the same as number 6 red_state.
11	buzzer_state	"0"	Notify when the buzzer stops.
		"1"	Notify when the buzzer is emitting pattern 1.
		"2"	Notify when the buzzer is emitting pattern 2.
		"3"	Notify when the buzzer is emitting pattern 3.
		"4"	Notify when the buzzer is emitting pattern 4.
12	sound_state	"1" to "70"	Notify when there is a change in the audio channel.
13	output_state	"on"	Notify when digital output turns ON.
		"off"	Notify when digital output turns OFF.

7.4. Cloud-to-Device Message fields

No.	Field name	Value	Description
1	alert	"6 digits"	• Controls the signal light and buzzer. • Set patterns in order: R (red) → Y (yellow) → G (green) → B (blue) → C (white) → Z (buzzer). • [RYGBC] - 0: light off, 1: light on, 2: flashing 1, 3: flashing 2, 9: no change • [Z] - 0: No sound, 1: Buzzer pattern 1, 2: Buzzer pattern 2, 3: Buzzer pattern 3, 4: Buzzer pattern 4, 9: No change
2	led	"5 digits"	• Controls the signal light. • Set patterns in order: R (red) → Y (yellow) → G (green) → B (blue) → C (white). • [RYGBC] - 0: light off, 1: light on, 2: flashing 1, 3: flashing 2, 9: no change
3	alert_do	0,1,9	• Controls digital output. • 0: OFF, 1: ON, 9: No operation
4	clear	1	Turn off all signal lights and stop playing the current channel.
5	sound	1 to 70	Play specified audio channel.
6	repeat*	0 to 255	Play the audio channel defined by the [sound] instruction the number of times specified here.

* Set a value of 255 for endless playback.

Caution: This will not run if an invalid value is specified.

8.   Troubleshooting

Use in combination with "8. Troubleshooting" in the "NH-FV Series User's Manual".

Problem	Check content
LED unit does not run as expected	Confirm the cloud connection settings are set up correctly.
	Confirm field names and values are specified correctly.
Does not connect to [Azure IoT Central]	Confirm the cloud connection settings (scope ID, device ID, and SAS token) are set up correctly.
	Make sure the product's time setting is correct.
Does not connect to [Azure IoT Hub]	Check the cloud connection settings (scope ID, device ID, and SAS token). All the settings must be blank.
	Confirm the connection string in the cloud connection settings is set up correctly.
	Make sure the product's time setting is correct.
Device-to-cloud Message does not notify when there are changes in digital input.	Check the signal definition in the digital input settings. Notify when there are changes according to the specified definition.

9. License agreement

9.1. Microsoft Azure IoT SDKs

<div align="center">

Microsoft Azure IoT SDKs

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