



## WIRELESS FUNGAL LOGGER LR8520

Data Loggers



## Fungal Growth Rate at a Glance

Predict the start of fungal growth

Prevent Fungal Occurrence in Business Critical Locations



Food & Grain Storage



Document Storage



Art Galleries and Museums

Countries and regions where wireless operation is

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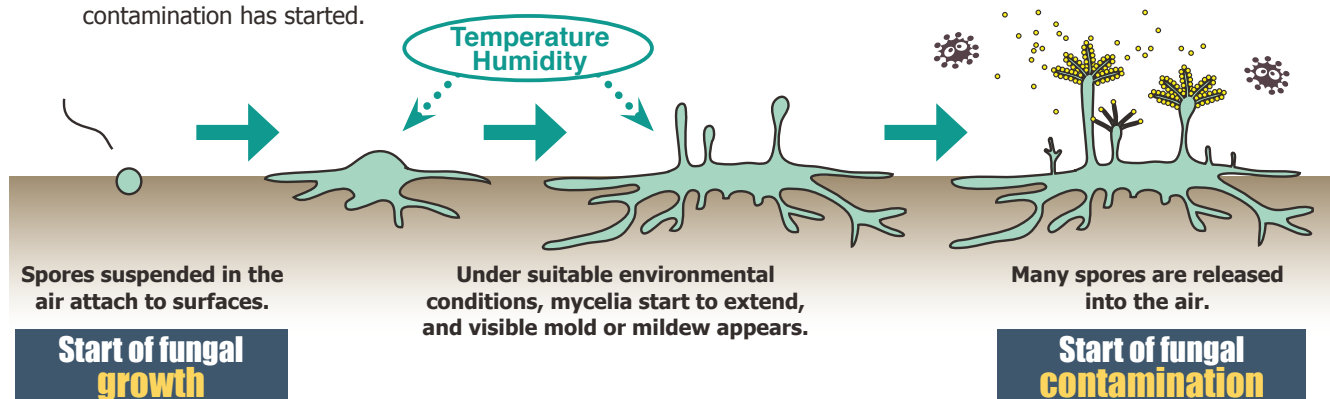
Thailand, Vietnam, and India

# *Fungal Growth Prevention: Shifting from Temperature and Humidity Management to "Fungal Index" Management*



## Fungal Growth and Contamination

- ▶ Fungal spores are floating in the air. These spores easily attach to any surface. Fungal growth then starts based on environmental conditions, such as source of nutrients, temperature, and moisture.
- ▶ There is a correlation between fungal growth and temperature/ humidity. If the environmental conditions are right, spores that have attached to surfaces will germinate, extend mycelia, and begin to grow. After a certain amount of fungal growth, visible fungi in the form of mold and mildew appear, and spores are released and dispersed through the air.
- ▶ It is not possible to see each fungus with the naked eye at the start of its growth, as it fungus is visible only after spores are formed. Once we are able to detect visible fungi, mold or mildew, the spores have already been released and fungal contamination has started.



**It is important to stop fungal growth as early as possible.**

The "Fungal Index" is effective for predicting the period of

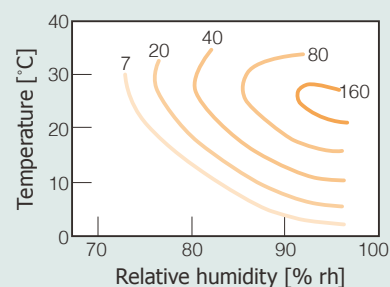
# Easily Predict Fungal Growth Based on 2 Indices



## Fungal index - Calculated based on temperature and relative humidity -

- ▶ This index, which predicts how easy it is for fungi to grow, was proposed by Keiko Abe, Doctor of Agriculture and Director of the Institute of Environmental Biology. Because fungal growth has a direct correlation with temperature and relative humidity, expected occurrence can be predicted. Mainly, this index can be used to express the indoor environment for fungal growth quantitatively. (Japanese Patent Number 2710903)
- ▶ The Hioki LR8520 Wireless Fungal Logger calculates the fungal index based on temperature and humidity measured using high-precision sensors.  
The fungal index is indicated by a value from 0 to 200, and can be used to predict the period of time until the start of fungal growth and contamination.

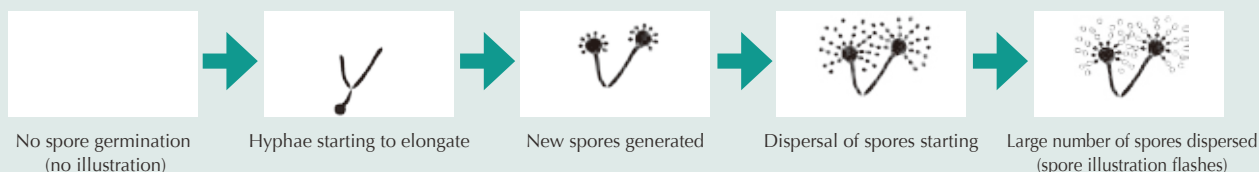
Fungal Index	Period of time until the start of fungal growth (estimate)	Period of time until the start of fungal contamination (estimate)	Locations in a home (example)
1	2 months	10 years or more	Dry areas Living spaces Closets Shoe storage
2	1 month	8 years	
5	2 weeks	3 years	
10	5 days	2 years	
20	3 days	1 year	Basements and crawl spaces Bathrooms Inside air conditioners running in cool mode
50	1 day	4 months	
100	12 hours	2 months	
200	6 hours	1 month	



\*Fungal contamination may be confirmed quicker in environments that are already contaminated or rich in nutrients necessary for fungal growth.

## Growth Prediction - Calculated based on the fungal index -

- ▶ If the fungal index value increases momentarily, that does not necessarily mean that fungal contamination will start immediately. Since fungal growth occurs when the necessary environmental conditions are maintained over a certain period of time, the cumulative value estimated from the fungal index can be used to predict fungal contamination.
- ▶ The Hioki LR8520 uses illustrations to indicate fungal growth in 5 stages based on the accumulative value.



### “Fungal Index” proponent

Director of the Institute of Environmental Biology, Doctor of Agriculture **Keiko Abe**

Graduate of Chiba University, Faculty of Horticulture, Department of Agricultural Chemistry. Completed Tokyo University Graduate School Doctorate. Majored in Microorganism Cellular Physiology.

Received the Japan Society for Bioscience, Biotechnology, and Agrochemistry's scholarship in 1985, for research in morphology changes



# Prevent Fungal Occurrence in Business Critical Locations

Thoroughly manage the environment of a room by including corners and areas near entrances and exits as inspection locations. The compact Hioki LR8520 can be easily installed in a variety of locations for detailed monitoring of environmental conditions.

## Food and Grain Storage



- ▶ Grain is traded in terms of weight, but its quality is maintained by keeping the grain as dry, and therefore as light, as possible.
- ▶ On the other hand, increased humidity brings about the risk of fungal contamination.
- ▶ If fungal contamination is discovered, the entire volume of product must be destroyed.

### Using the fungal logger

**You can easily check if environmental conditions promote fungal growth in order estimate how high the humidity can be safely raised.**

## Document Storage

- ▶ Fungal growth can occur on the surface of boxes that are stored at room temperature in environments where temperature and humidity are not controlled.
- ▶ Customers might seek verification that fungal growth will not occur.

### Using the fungal logger

**Confirm that environmental conditions of storage areas at room temperature discourage fungal growth. Reassure customers by explaining the principles and applications of "fungal index".**



## Art Galleries and Museums



- ▶ Although temperature and humidity are controlled to preserve cultural properties, stagnant air in display cases and storage vaults promotes fungal growth.
- ▶ Because of the large number of people entering and exiting, you may not notice a rise in the temperature and humidity.

### Using the fungal logger

**Install the LR8520 in display cases and monitor the data remotely using a tablet PC. Set alarms to warn of changing environmental conditions that run the risk of promoting fungal growth.**

## Buildings

- ▶ Since buildings have a high degree of air tightness, fungal growth occurs easily in any season.
- ▶ In the summer, fungal growth occurs easily in areas subject to cool air from air conditioning units.
- ▶ Air conditioning is set to excessively control temperature and humidity in an attempt to prevent fungal growth.

### Using the fungal logger

**Easily identify the range in which fungal growth occurs in order to moderate**



# Useful Features for Managing the Fungal Index

## Recorded Items

In addition to the fungal index and growth prediction, the LR8520 also records temperature and humidity so that changes can be identified according to time period and season. The screen can be toggled to display temperature and humidity, and the logger also records the maximum, minimum, and average values for each parameter at the set recording interval.



Temperature and humidity display



Fungal index display  
(Max. and Min. values)

## Sensor

Select from 2 types of high-precision  $\pm 3\%$  rh humidity sensors: a 50 mm sensor for measuring temperature and humidity in the immediate area, and a 1.5 m sensor useful for taking measurements in locations away from the unit.



50 mm

Immediate confirmation of measured values



1.5 m

Discreetly installed below the tabletop

## Power source

The unit supports a variety of power sources such as an AC adapter (sold separately), AA alkaline batteries x 2, or an external power source (such as from 5 V to 13.5 V DC/ USB\*).

\* A conversion cable is required. Please inquire with us.



AA alkaline batteries



AC Adapter

### ✓ Power-saving function for longer battery life

Set to turn on the Bluetooth® only during a pre-set time period. The shorter the power is on, the longer the battery will last.

Continuous operating time (Battery)	WIRELESS FUNGAL LOGGER LR8520
Recording interval of 1 min, Bluetooth® OFF	3.5 months
Recording interval of 1 sec, Bluetooth® OFF	3 months
Recording interval of 1 sec, Bluetooth® ON	20 days

## Alarm

Using the built-in alarm function, if measured signals fall outside defined ranges, "ALARM" can be displayed.

You can also connect the logger to an external buzzer or warning indicator lamp. (The buzzer and warning indicator lamp must be prepared separately.)

Set individual alarm ranges for fungal index, growth prediction, temperature, and humidity, according to your needs.



## Calibration

Calibration of measurement accuracy is conducted at Hioki and is required only for temperature and humidity sensors, but not for the Hioki LR8520 logger. Hioki provides both calibration results and a certificate of calibration. Please inquire with your Hioki distributor to request a calibration.

By keeping spare, calibrated temperature/ humidity sensors on hand, you can avoid any interruptions in measurement work when calibration is necessary.



Calibration required



Calibration not required

## Use with Logger Series

You can use the fungal logger together with other loggers in the wireless logger series of products to take a variety of measurements.

For example, you can use it in combination with the Hioki WIRELESS CLAMP LOGGER LR8513 to simultaneously control both air conditioning load current and fungal index as part of your energy saving measures.



WIRELESS PULSE  
LOGGER LR8512



WIRELESS CLAMP  
LOGGER LR8513



## Specifications

\*Only the temperature and humidity sensors affect the measurement accuracy and are subject to calibration. The LR8520 logger does not require calibration.


Supported devices	<ul style="list-style-type: none"> <li>Android™ smartphone or Android™ tablet (Download app from Google Play)</li> <li>Windows PC or Windows tablet (Use bundled software)</li> <li>WIRELESS LOGGING STATION LR8410-20</li> </ul> <p>*The settings can only be configured from supported devices.</p>
Control and communications	Bluetooth® 2.1+EDR or later Profile: SPP Communications Range: 30 m, line-of-sight (Depends on the performance of the communication supported device)
Display contents	Temperature, humidity, fungal index (0 to 200), growth prediction (5 levels), date, time, number of recorded data, maximum value, minimum value, and average value
Input	1 temperature channel + 1 humidity channel (HUMIDITY SENSOR Z2010 or HUMIDITY SENSOR Z2011 is required (sold separately))
Measurable range	[Temperature] -40°C to 80°C, Range 100°C f.s., Max. resolution 0.1°C [Humidity] 0% rh to 100% rh, Range 100% rh f.s., Max. resolution 0.1% rh
Temperature measurement accuracy (using Z2010/Z2011)	±0.5°C (10°C to 60°C), using Z2010/Z2011 If outside above temperature range: Add 0.015°C/°C (-40°C to 10°C) or 0.02°C/°C (60°C to 80°C)
Humidity measurement accuracy (using Z2010/Z2011)	±3% rh (20°C to 30°C, 20% to 90% rh) If outside above range, see Figure 1
Output	Outputs alarm signals
Recording intervals	0.5 sec to 30 sec, 1 min to 60 min, 14 selections
Storage capacity	500,000 data items
Recording modes	Instantaneous value
Continuous recording	Set to ON or OFF ON: When the storage limit is reached, the oldest data is deleted and the unit continues to record (endless recording) OFF: Recording stops when the storage limit is reached (one-time recording)
Operating temperature and humidity	-20°C to 60°C, 80%rh or less (non-condensing) (When operating on battery power, these values will vary according to the battery specifications.)
Storage temperature and humidity	-20°C to 60°C, 80%rh or less (non-condensing) (With batteries removed)
Applicable standards	Safety EN61010
	EMC EN61326 class A, EN61000-3-2, EN61000-3-3
	Wireless certification Japan: Incorporates a wireless module that has been certified as compliant with applicable technical standards. US: Part 15.247 (Contains FCC ID: QOQWT111A) Canada: RSS-210 (Contains IC: 5123A-BGTWT111A) EU: EN 300 328, EN 301 489-1, EN 301 489-17

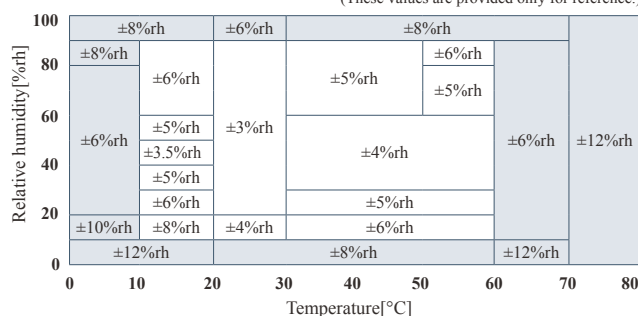
Vibration endurance	JIS D 1601:1995 5.3(I), Category 1: Vehicle, Condition: Category A equiv.
Power source	AC adapter AC ADAPTER Z2003 (sold separately, DC 12 V)
	Battery AA alkaline batteries (LR6) × 2
	External power DC 5 V to 13.5 V * can also be supplied from USB bus power via a conversion cable
Continuous operating time (Battery)	3.5 months (Recording interval of 1 min, Bluetooth® OFF) 20 days (Recording interval of 1 sec, Bluetooth® ON)
Dimensions and mass	85 mm (3.35 in) W × 61 mm (2.40 in) H × 31 mm (1.22 in) D (Excluding protrusions), 95 g (3.3 oz) (Not including the battery)

### ■ Functions

Alarm	: ALARM is displayed when values fall outside defined ranges Open drain output (Max. rating: 30 V DC, 200 mA)
Scaling	: Measured values are scaled when displayed
Recording operation hold function	: If the power source is interrupted while recording, recording will start again automatically when the power is restored.
Erroneous operation prevention	: Confirmation messages are displayed when recording is started/stopped and when turning the power off
Comment recording function	: Titles and comments for each channel can be recorded
Power saving function	: Power can be saved by turning Bluetooth® on and off as necessary
Authentication function	: A password can be set for user authentication

### ■ Humidity measurement accuracy (fig. 1)

The accuracy of values shown in  is not guaranteed.  
(These values are provided only for reference.)



## Order Code/ Options

### WIRELESS FUNGAL LOGGER LR8520



#### Accessories :

CD-R (Instruction Manual, Logger Utility, Wireless Logger Collector) × 1, Measurement Guide × 1,  
Caution for Using Radio Waves × 1, AA alkaline batteries (LR6) × 2, CONNECTION CABLE L1010 × 1

Temperature and humidity sensor, and AC Adapter are not included.

CONNECTION  
CABLE L1010  
1.5 m (4.92 ft)  
Bundled and  
also available for  
additional purchase

HUMIDITY SENSOR Z2010 or HUMIDITY SENSOR Z2011 is required to measure humidity.



HUMIDITY SENSOR  
Z2010  
50 mm (0.16 ft)



HUMIDITY SENSOR  
Z2011  
1.5 m (4.92 ft)



AC ADAPTER  
Z2003  
100 to 240 VAC,  
50/60Hz



MAGNETIC  
STRAP Z5004

**Precaution:** Although the fungal index is a highly reliable index based on academic research, it does not assure that absolutely no fungus will grow in environments with a low fungal index.

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