THIR-6000 Bluetooth Series

THIR-6000B

THIR-6000HB

THIR-6000DM-B

Handheld Image Reader
(Linear / 2D Scanner)

OPERATION MANUAL

TOHKEN CO., LTD.

2nd Edition
February 25, 2009

TOHKEN

[Memorandum]

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APPLICATION NOTICE

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TRADEMARKS

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Introduction

Thank you for purchasing this product.

This manual explains the features of this product in addition to its operation, system configuration, specifications, etc. Please read this manual carefully so as to ensure proper operation of this product. Should any problems arise during use, please document it carefully for purposes of reproduction by our support team. The content of this manual may be changed without notice. Please check our website for regular updates

Safety Notices

DO NOT DISASSEMBLE

Do not disassemble this product as this will void the warranty and lead to failure or accident.

Follow

Please observe the warnings and notes for PCs used with this product.

Disconnect Power

Immediately stop use if smoke, strange odors or noise are produced by the product.

Continuing operation as is risks fire or electrocution.

Cautions on Handling

CAUTION

About memory backup

This product has a memory backup function for the settings. This backup can not guaranteed if repair, refurbishment, upgrade, etc. are performed on this Image Reader.

CAUTION

Avoid using or storing this product in direct sunlight or at temperature or humidity outside the product specifications.

CAUTION

Do not expose the unit to water, water vapor, oil, etc.

CAUTION

This unit may be damaged in environments with corrosive gas.

CAUTION

When grime or dust is stuck on the reading window, please follow the following steps to clean it:

- Gently wipe off the grime with a cloth or cotton swab moistened with alcohol.
- Gently wipe again with a dry cloth.

DO NOT use chemicals to wipe off the case.

In cases of severe soiling, gently wipe with a neutral detergent.

CAUTION

This is a high-precision optical device. Avoid shocking the product such as fall.

CAUTION

This unit is intended for use with general electronics devices such as personal computers, office automation equipment, mesurement equipment, industrial robots, AV equipment etc. Take suitable actions at the customer when used in units or systems related to the control and safety of transport devices (cars, trains, airplanes), traffic right, gas leak sensors or any type of safety equipment. Never use in applications requiring extremely high reliability such as satelites, nuclear power equipment, undersea relays, or medical requipment directly involving human lives.

The frequency band of this unit (IEEE802.15.1) is also applied in integrated wireless stations used by other industrial, scientific or medical instruments like microwave ranges (ISM band) (wireless stations requiring licensing), as well as special low-power wireless devices 9not requiring a liscensing), and amateur radio stations (requiring liscensing). .
To avoide cross talk, please follow the following instruction.

1. Check that there are no integrated wireless stations for identification of mobile devices, low-power wireless stations as well as special wireless stations and amature radio stations nearby.
2. If this device should somehow exert adverse electrical interference on integrated wireless stations for identification of mobile devices, immediately contact our sales department in order to discuss actions for avoiding cross-talk (for example, the installation of partitions, etc.), having changed the operating frequency or stopped the generation of the electromagnetic waves.
3. In addition, immediately contact our sales department if problems should arise where the device exerts adverse electrical interference on low-power wireless stations for identification of mobile devices, or amateur wireless stations.

Prohibited

Handle the Li-ion battery with care. Improper handling or use of batteries risks fire, explosion, leakage, or other hazard.

- Do not expose to fire or heat the battery.
- Do not disassemble the battery.
- Do not reverse the polarity.
- Do not touch the poles with metal objects
  Do not transport or store the battery together with metal necklaces, hairpins, etc.
- Do not apply strong shocks to the battery such as piercing with a nail, striking with a hammer, stepping on it, etc.
- Do not disassemble or modify the battery.
- Do not use or place the battery in hot locations such as near fire, next to heaters, etc., or in locations with direct sunlight or within cars exposed to the sun.
- Do not place the batter in a microwave oven or pressure vessel, etc.
- Only use the dedicated charger for rechargign the battery pack.
- Do not charge by directly connecting the battery to an electrical outlet, automobile cigarette lighter, etc.

Prohibited

Do not charge the battery near fire, under direct sunlight, etc.
Do not drop this unit or subject to strong shocks.
Handle the unit with care as it is a precision device.

Device Usage/Storage Location

CAUTION

Do not use/store this unit in the following locations. Use in the following locations may result in electrocution, fire, or malfunction, and may cause surrounding devices to malfunction.

- Where there is a great deal of static electricity, dust, or humidity
- Locations that exceed the temperature range (Usage: 0~40°C, Storage: -20~60°C) or the Humidity range (35~85%RH) (marshes, etc.)
- Locations exposed to direct sunlight (car dashboards, etc.)
- Locations around fire or hot air, etc.
- Adjacent to chemicals, etc.
- Near HVAC equipment
- At locations at risk for exposure to water drops, electrical sparks, etc.
- Locations generating a strong magnetic field
- Near TVs, radios, cordless telephones, etc.
- Inside medical facilities such as hospitals
- Near medical electronics such as hearing aids, pacemakers, etc.
- Near automatic control equipment such as fire alarms, automatic doors, etc.

Long-term storage

CAUTION

When storing this unit, be sure to avoid locations where there is vibration, dust, high humidity, low temperature, high temperature or direct sunshine.

Wireless device

- This unit is wireless device using a frequency in the 2.4GHz band

- No license, registration and/or contract is needed to use this unit.

Download information

Please access the following URL to download documents related to this product.

http://www.tohken.co.jp/DL/

You can download;

1- Operational Manual
2- Configuration Barcode Menu
3- Bluetooth – USB Adapter Connection Instruction
4- Bluetooth – Serial Adapter Connection Instruction
5- TMA-6000 and TMA-6000U Wireless Adapter Connection Instruction

Unpacking the product

After opening the shipping package containing the THIR-6000, take the following steps:

1- Check for damage that might occur during the shipping process. Report the damage immediately to the carrier who delivered the shipment.
2- Save the shipping container for later storage or shipping.
3- Make sure everything ordered is present.

Components	Qty
THIR-6000B series unit	1
Start-up Instruction Manual	1

Items not included with the product

- Charging base (TBC-6000) *see appendix 1 for more detail

Used to charge the rechargeable battery of THIR-6000B series

TBC-6000

- Wireless unit (TMU-6000) *see appendix 2 for more detail

This unit contains USB dongle for Bluetooth communication between THIR-6000B series and PC. The configuration for Bluetooth communication can be done on the PC.

TMU-6000

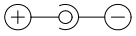
- Wireless adapter TMA-6000 and TMA-6000U *see appendix 3 for more detail

This unit can be used for Bluetooth communication between THIR-6000B series and PC. With this adapter, the configuration for Bluetooth communication can be done without using the PC.

TMA-6000 : RS-232C interface. Needs AC adapter

TMA-6000U : USB interface

- AC Power Adaptor (Optional): If purchasing separately, select an adapter with output DC3V to DC6V range and more than 10W. Please confirm polarity and DC plug type as below.

Polarity: 

DC plug type: EIAJ RC5320A Voltage Segment 2

- Set of the scanner

Scanner	Charging base	AC adapter
THIR-6000B series	TMU-6000	(Tohken's recommendation)

- Set of the wireless unit and wireless adapter

Wireless unit / adapter	Dongle	AC adapter	Instruction
TMU-6000 Wireless unit	USB type		Bluetooth - USB Adapter Connection Instruction
	RS-232C type		Bluetooth - Serial Adapter Connection Instruction
TMA-6000 Wireless adapter		(Tohken's recommendation)	Wireless Adapter Connection Instruction
TMA-6000 Wireless adapter			

Table of Content

1. Getting started

Equipped with a powerful state-of-the-art 2D Imager Scanner and processing CPU, the THIR-6000 is ready for capturing images as well as decoding 1D or 2D bar codes.
The THIR-6000 is a 2D Imager Scanner that reads Liner, 2D, and Postal barcodes to meet many different requirements in Delivery, Transportation, Meter Reading, and many other applications.

The ergonomic design of the THIR-6000 provides user comfort even during lengthy scanning sessions.

The THIR-6000 is available with different interfaces to accommodate various applications. The THIR-6000 has an RS-232C interface for connection to a host computer. The THIR-6000(H)U, on the other hand, has a USB interface for connection to a host computer running Windows2000/XP. THIR-6000(H)U can be used as a Human Interface device. The configuration barcodes are prepared to change the THIR-6000(H)U's interface from USB to HID and vice versa. The Human Interface Device function can send data to application software same as keyboard input.

1) Supported barcodes

The unit can read the following symbols:

1D bar codes:

- Code39
- Code128
- Codabar
- ITF (interleaved 2 of 5)
- JAN/EAN/UPC
- RSS
- Code93

2D codes:

- Data Matrix (ECC200)
- QR Code
- Micro QR
- PDF 417
- Micro PDF
- Maxi Code
- Composite

2) Picture taking (except THIR-6000(H)U as a Human Interface Device)

The THIR-6000B can take pictures for such items as seals, signatures, or ID photos.

3) Ordering information

THIR-6000 (H) (DM) B
1 2 3

1. Resolution
   An “H” following “THIR-6000" indicates that the scanner is the high resolution type.
   No “H” indicates that the scanner is a normal resolution type.
2. Direct Parts Marking
   A “DM” following “THIR-6000” or “THIR-6000H”, indicates that the scanner is for direct parts marking applications. The DM type has special optical and illumination settings.
3. Bluetooth
   “B” means the THIR-6000 interface is Bluetooth.

According to this rule, there are 3 types in the THIR-6000B family.

- **THIR-6000B**
- **THIR-6000HB**
- **THIR-6000DM-B**

1.1 Scanner components

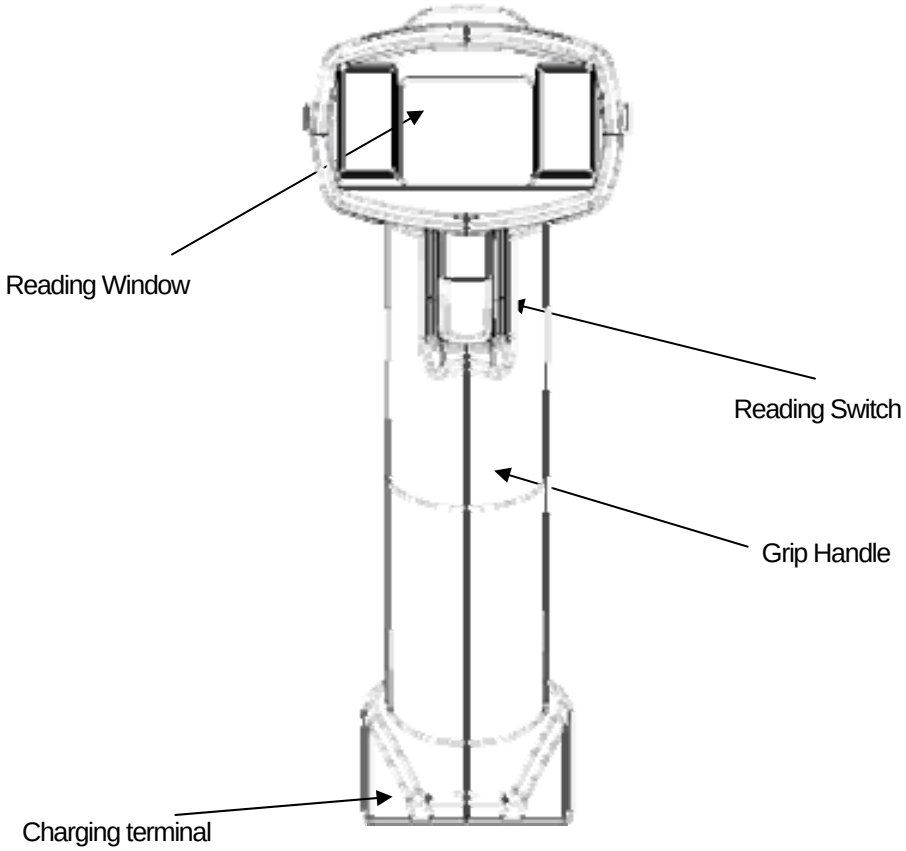


Figure1a. Front View

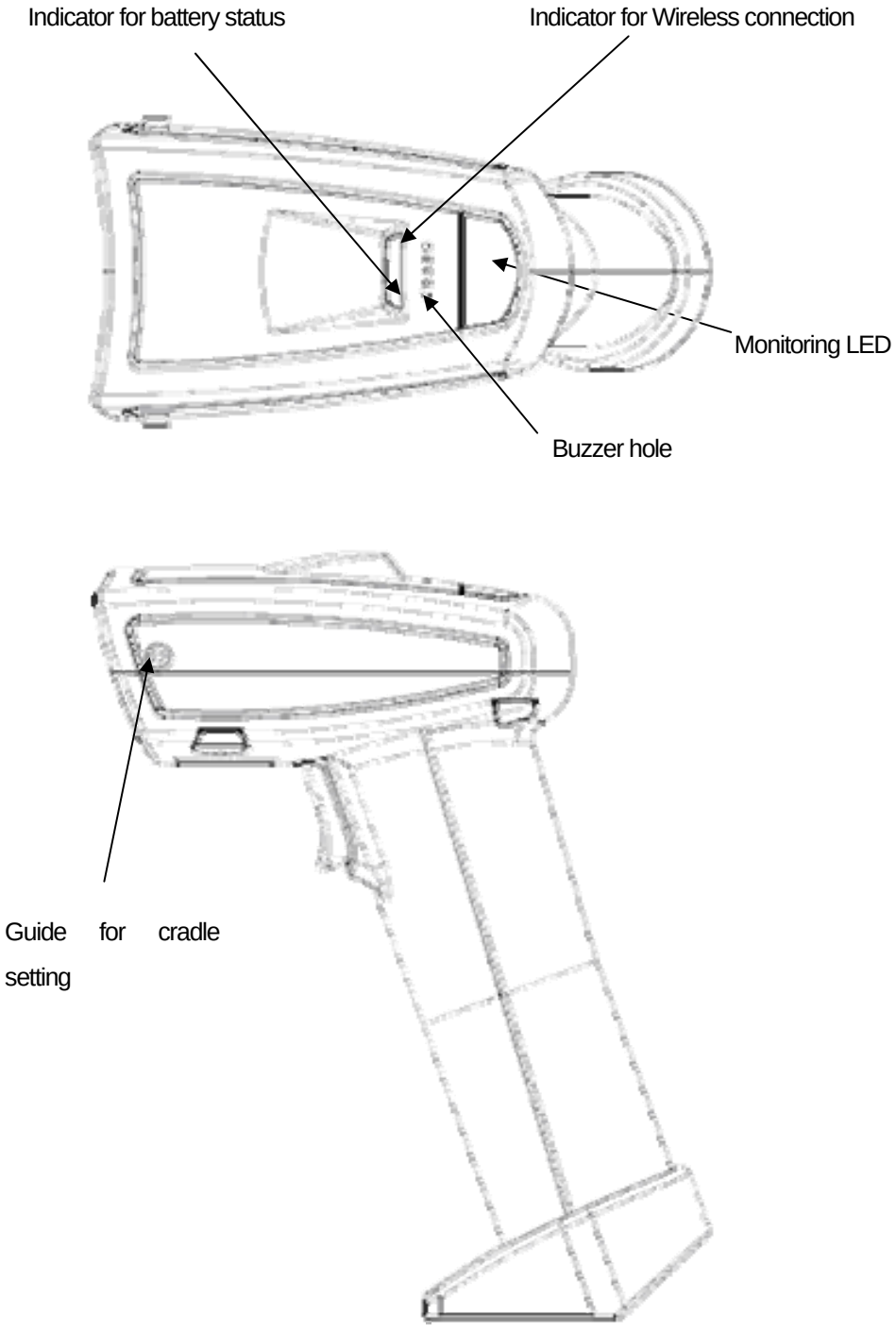


Figure1b. Side and Rear View

1.2 Part Functions

- Monitoring LED

  The monitoring LED lights up either GREEN or RED depending on the operation:

  - ✓ A GREEN light indicates the successful decoding of a symbol.
  - ✓ A Flashing GREEN light indicates image data transmission in progress.
  - ✓ A RED light indicates failure of data transmission.

- Triggering Switch

  This switch is used to initiate the reading and decoding of a symbol.

- Indicator for wireless connection

  A GREEN light indicates the status of the wireless connection.

  - ✓ Turn-ON: Connected
  - ✓ Turn-OFF: Disconnected

- Indicator for battery status

  GREEN, ORANGE, RED lights indicate the status of the battery.

  - ✓ GREEN: Powered
  - ✓ ORANGE: Charging.
  - ✓ RED: Low battery

- Buzzer

  The buzzer indicates the states of reading and communication.

- Charging terminal

  Used to charge the battery

- Guide for cradle (charging base) setting

  Used to adjust the position when the THIR-6000B is set in the charging base

2. How to use THIR-6000B

2.1. Battery charging

THIR-6000B employs a Li-ion rechargeable battery.

Since new batteries are not fully charged, please charge the battery by following the instructions below.

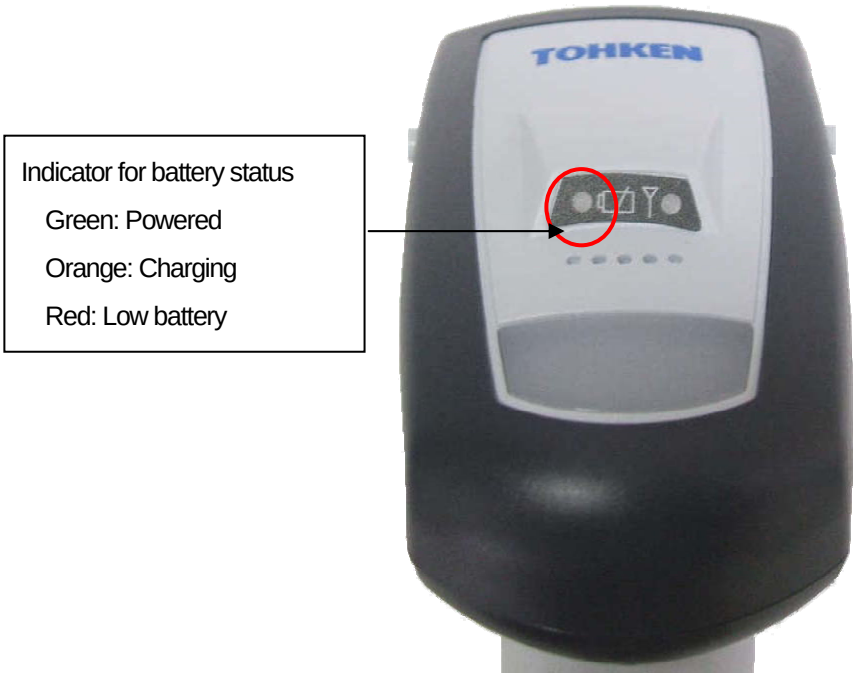
Battery charging begins once the THIR-6000B is set into the charging cradle. .

*Please see “Appendix 1” for more information about the cradle.

1. Insert THIR-6000B by adjusting its “guide” to the slit of the cradle.

2. Gently set the bottom of the handle (the charging terminal side) into the cradle.

3. The indicator for battery status will change to orange. When the battery is fully charged, it will turn green. Normally, the charging time is 3 hours.



CAUTION

- Charging time will vary depending on the remaining charge.
- Failure to set the THIR-6000B properly into the crade will prevent proper charging.
- Dust and dirt on the charging terminals may impede proper charging. Periodically clean the charging terminals using a cotton swab moistened with ethanol or a neutral detergent.
- The rechargeable battery is a consumeable item. The battery has likely reached the end of its lifetime if the usage time after charging has become noticeably shorter. A good rule of thumb for battery lifetime is around 300 discharge/recharge cycles, or two years of use under proper usage conditions. Contact our sales department for replacement batteries.

2.2 Connecting to a Host Computer

The THIR-6000B series can connect to the host PC even when it is being charged.

Preparation -- With TMU-6000 (Bluetooth – USB or Bluetooth – RS232C adapter) --

1. The configuration of the adapter's communication settings is needed when THIR-6000B series connect to the adapter for the first time or its connection settings have to be changed.

2. This configuration procedure depends on the type, model and manufacture of the adapter. Please follow the instruction provided by the manufacture.

3. Usually it is done by following the instruction manual and installation CD enclosed with the adapter.

4. "Bluetooth - USB Adapter Connection Instruction" and "Bluetooth – Serial Adapter Connection Instruction" are prepared for typical adapter can be used with THIR-6000B series.

Preparation -- With TMA-6000 or TMA-6000U --

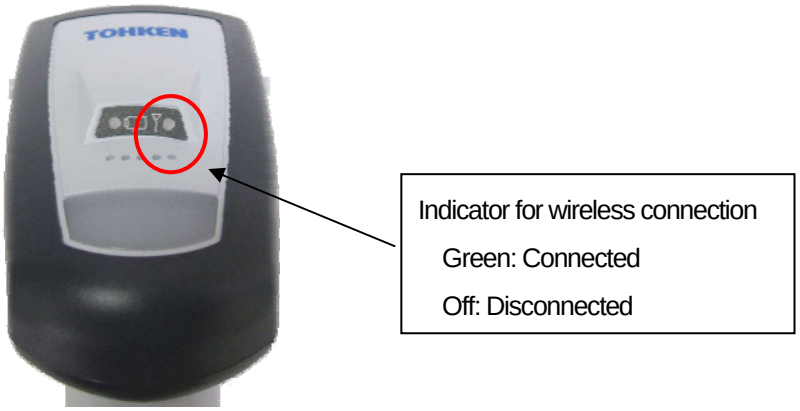
1. By using the wireless adapters (TMA-6000 or TMA-6000U), THIR-6000B series can connect to the host PC. When THIR-6000B series read the barcode placed on the housing of TMA-6000, the scanner establishes Bluetooth connection with the host PC through TMA-6000.

2. "TMA-6000 and TMA-6000U Wireless Adapter Connection Instruction" is available. Please download from our web site or ask our sales representative.

Check the status of connection

If the indicator for wireless connection turns green, the THIR-6000B is connected to host computer. If it turns off, it is disconnected.

.



Security settings

A PIN CODE can be set for a security reason. See “7.4 How to configure security settings”.

* TMA-6000 employs its unique PIN CODE which can not be changed by users.

2.3 Connect to host PC

1. Communication settings

Connect to Bluetooth adapter by using Bluetooth profile (SPP).

With TMU-6000 (Bluetooth – USB adapter)

The host PC allocates a virtual COM port to communicate with the Bluetooth – USB adapter’s driver software. The communication settings of the virtual COM port (Baud rate and frame structure) can be ignored.

With TMU-6000 (Bluetooth – Serial adapter)

Please use the communication software attached to TS-232C adapter to configure the communication settings of the adapter and THIR-6000B series.

With TMA-6000

When THIR-6000B series read the barcode placed on the housing of TMA-6000, the scanner establishes Bluetooth connection with the host PC through TMA-6000. Please see “TMA-6000 and TMA-6000U Wireless Adapter Connection Instruction” for more detail.

2. Communication protocol

There is no need to set a communication protocol. In order to receive data, the host computer has to be installed with software with the following functions.

- Receiving data from the THIR-6000B
- Sending serial commands to the THIR-6000B
- Receiving picture from the THIR-6000B

Contact our sales representative for a sample of this software.

2.4 Confirming read data reception

Barcode data read by the THIR-6000B is sent to the host computer. Users can be informed of the successful transmission of data to the host though a buzzer, LED indicator, or vibration.

See “7.5. How to confirm data transmission” for further details.

* This function is not available with TMA-6000 and TMA-6000U

2.5 Image preprocessing [DM type only]

Reading of difficult-to-read low quality barcodes can be improved by a suitable image filter in using image preprocessing. This is particularly effective with direct-marked (DM) barcodes).

See “7.6 Image preprocessing” for a detailed command list.

For further details about image preprocessing, ask our sales department for the “Operation manual for image preprocessing”.

* This function is not available with TMA-6000 and TMA-6000U

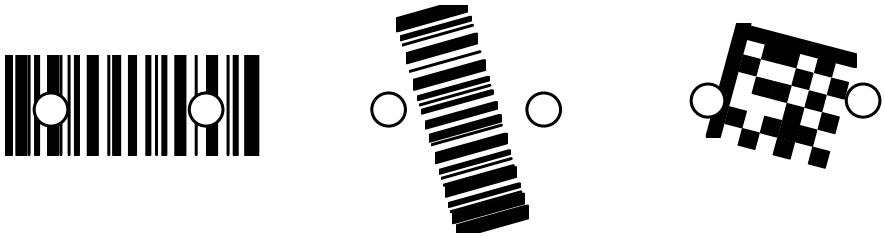
3. Operation

3.1 Barcode reading

- Once the user pulls the reading switch, the THIR-6000 shows two red pointers by LED light to indicate the reading area.

Note: The pointers turn off automatically after 30 seconds if there is no reading operation. Pressing the READ switch will cause the pointers to flash again.

- While pressing the reading switch, position the reader so that the pointers are at the center of the barcode.



- Upon completion of successful reading, the monitoring LED lights up “GREEN” and the unit beeps once.

- Release the reading switch.

3.2 Beeps

Event or Status of scanner	Sounds
Power ON	Beeps 5 times (long, long, short, short, short)
Establish wireless connection	Short beep 2 times
Disconnect wireless connection	Short beep 3 times
Successful reading	Short beep 1 time
Data transmission failure	Short beeps 7 times
On all the other occasions	Remains silent

3.3 Image data reading

*) The THIR-6000U can not capture images as a HID.

Bitmap/image (name*.bmp, 1280 x 1024 pixel)

- Transmitting the data by a serial interface takes 2 min. at a baud rate 15.2Kbps (THIR-6000).
- In the case of USB1.1, (THIR-6000(H)U), transmitting the image takes approximately 10 seconds.

The green monitoring LED blinks while the unit transmits the image.

Notes:

A) The host computer should be provided with software to receive the transmitted data.
B) The image size is changeable.

* This function is not available with TMA-6000 and TMA-6000U

3.4 Vibration

The unit will vibrate when a barcode has been successfully decoded.

The barcode setting menu is available to enable/disable this function,.

4. Communications

4. 1 Bar Code Data Transmission:

The unit transmits the scanned data to the host computer.

4. 2 Serial Command Transmission:

The host computer transmits the command signals to the unit and sets up the operation of the unit.

* This function is not available with TMA-6000 and TMA-6000U

4. 3 Image Data Transmission:

The unit transmits the captured image data to the host computer.
Tohken's unique transmission protocol is used and it requires special software to receive the images from THIR-6000B series.

* This function is not available with TMA-6000 and TMA-6000U

5. Specifications

5.1 General specifications

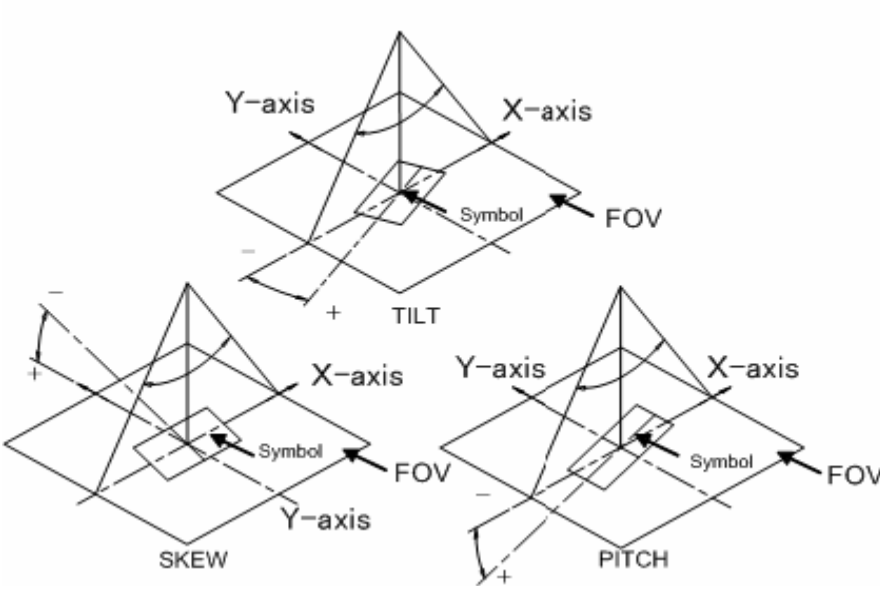
Type	THIR-6000(H)
Dimensions	159(H)×63(W)×99(D)mm
Weight	Approx. 220 g (including the battery)
Illumination	1. White LED (THIR-6000B, THIR-6000HB) 2. Red LED (THIR-6000DM-B)
Aiming beam	Red LED (peak wave length is 644nm)
Indicator	Monitoring LED (3 colors), Vibration
Image sensor	CMOS color area sensor (1.3M pixel)
Minimum resolution	1. 0.125mm (1D barcode), 0.19mm (2D barcode) (THIR-6000B) 2. 0.1mm (1D barcode), 0.167mm (2D barcode) (THIR-6000HB, THIR-6000DM-B)
Supported barcodes (1D)	Code39, Code128, EAN128, Codabar, ITF, JAN/EAN/UPC, RSS, Code93
Supported barcodes (2D)	Data Matrix (ECC200), QR Code, Micro QR Code PDF417, MicroPDF, MaxiCode, Composite Postal code
Format	ASCII or Bitmap(image)
Bluetooth interface	Bluetooth 2.0 Class1 *can be worked with Windows 2000/XP
Battery	Li-ion rechargeable battery (3.7V, 2200mAh)
Operating time	7 hours (calculated with 5 seconds per 1 barcode reading)
Charging time	3 hours
Environmental specifications	
Operational Temperature	0 to 40 degrees centigrade
Storage Temperature	- 20 to 60 degrees centigrade
Operational Humidity	35 to 85 %RH (Non-condensing)
Storage Humidity	35 to 85 %RH(Non-condensing)
Vibration	10 to 55 Hz(max. 4G)
Shock	Durable multiple drops to concrete from 7ft.

5.2 Functional specification

Reading Direction

- PITCH : ±35 degree
- SKEW : ±35 degree
- TILT : 360 degree
- Ambient Light : 0 to 10,000 lx

Viewing angle



5.3 Reading Range/Depth

Decodable Symbols

Liner: Code39, Code128, EAN128, Codabar, ITF, JAN / EAN / UPC, RSS

Check digit calculation method:

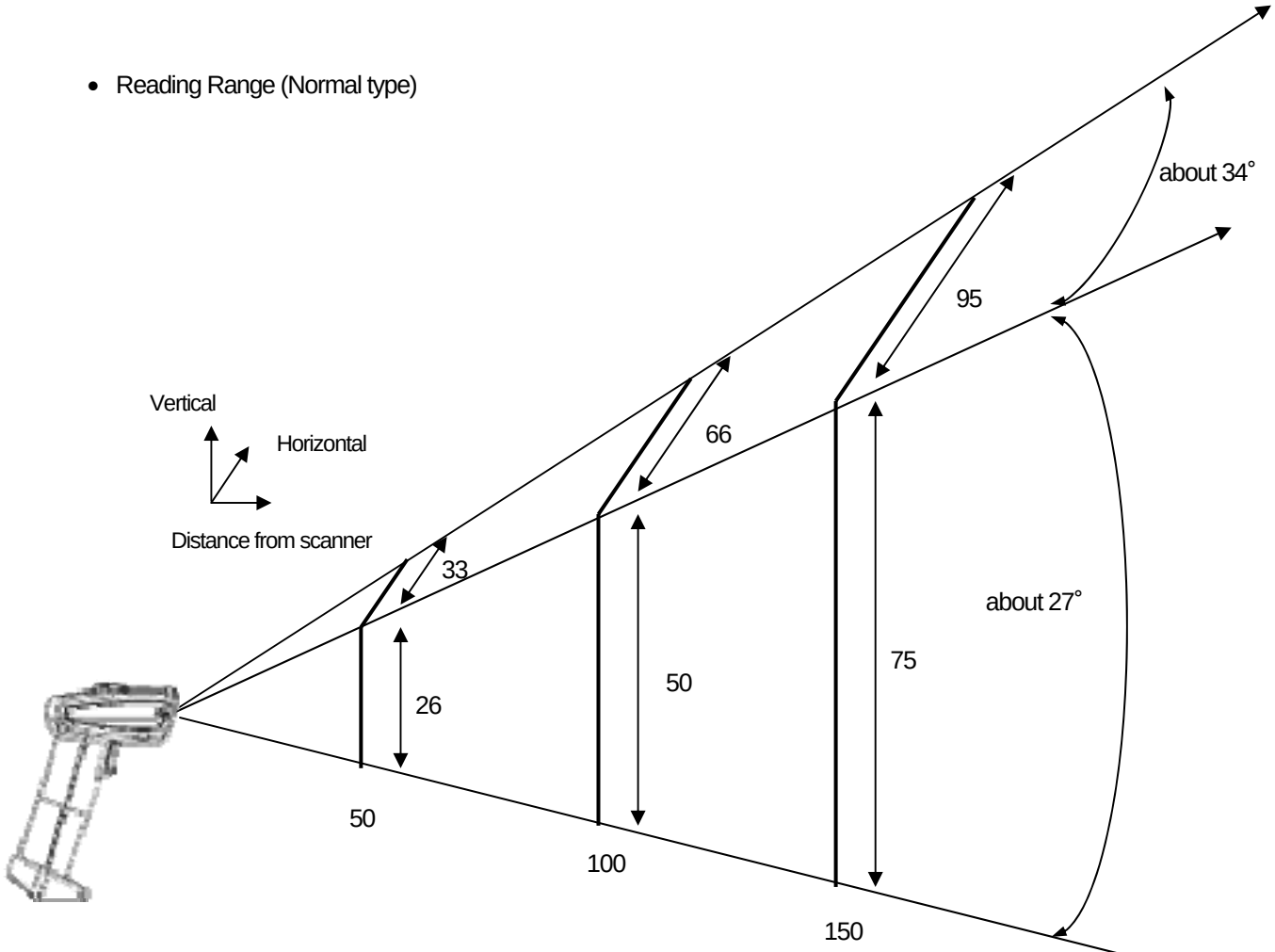
Code39	Modulus 43
Codabar	Modulus 16
ITF	Modulus 10

2-D: Data Matrix(ECC200),QR Code, Micro QR Code,PDF417,Micro PDF, Maxi Code, Composite

Reading Digit:

(Except ITF)	1～2047
(Only ITF)	2,4,6～2047

- Reading Range (Normal type)



1D(0.125) 70～110

1D(0.15) 60～130

1D(0.25) 40～160

1D(0.33) 40～180

2D(0.19) 80～110

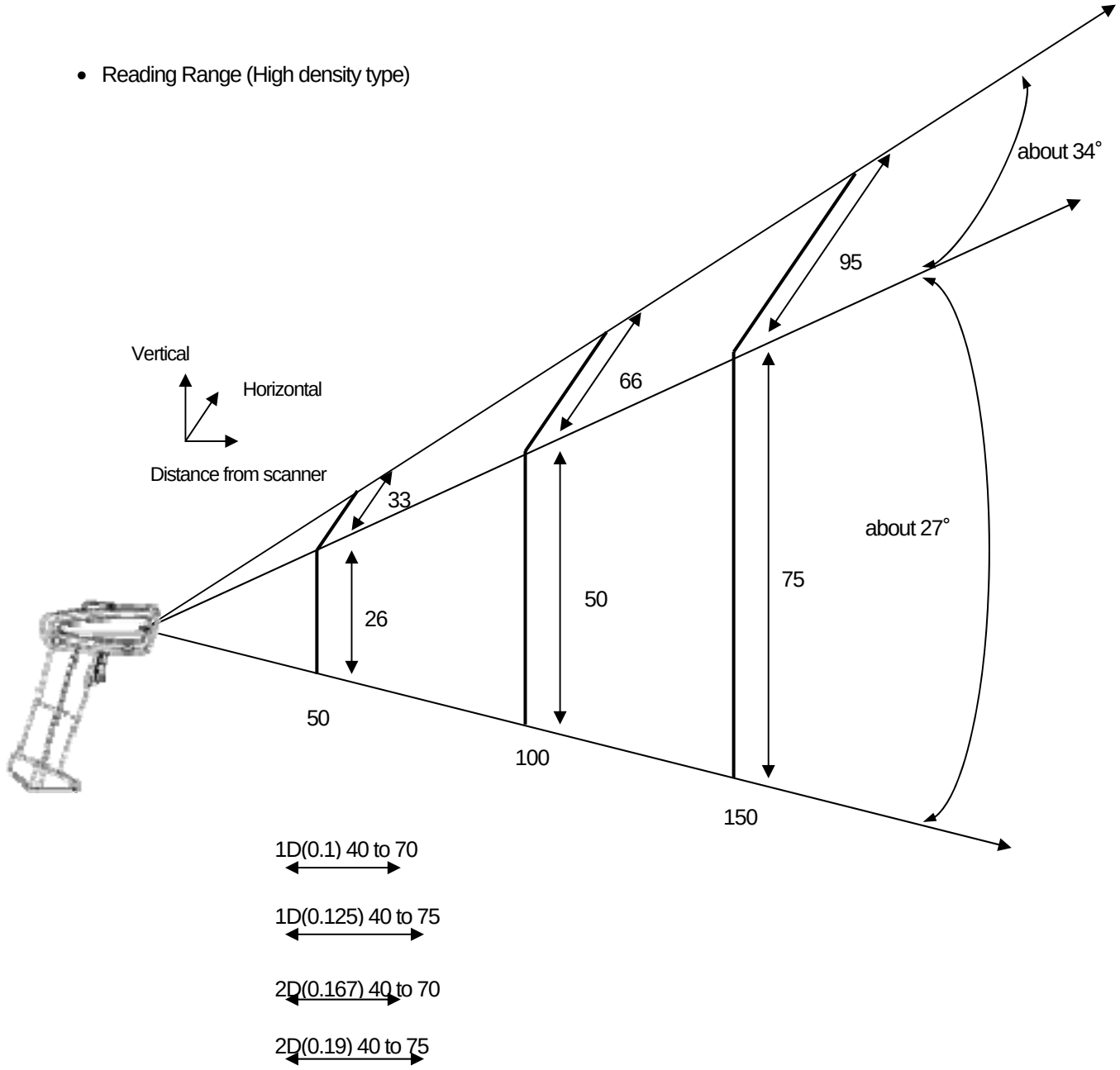
2D(0.25) 60～130

2D(0.33) 50～160

unit : mm

- Reading ability depends on environment (brightness etc) and the printing quality of scanned barcodes.
- Measured in 500 to 1000(lx) of homogeneous brightness, printed with good quality, no pitch and no skew.

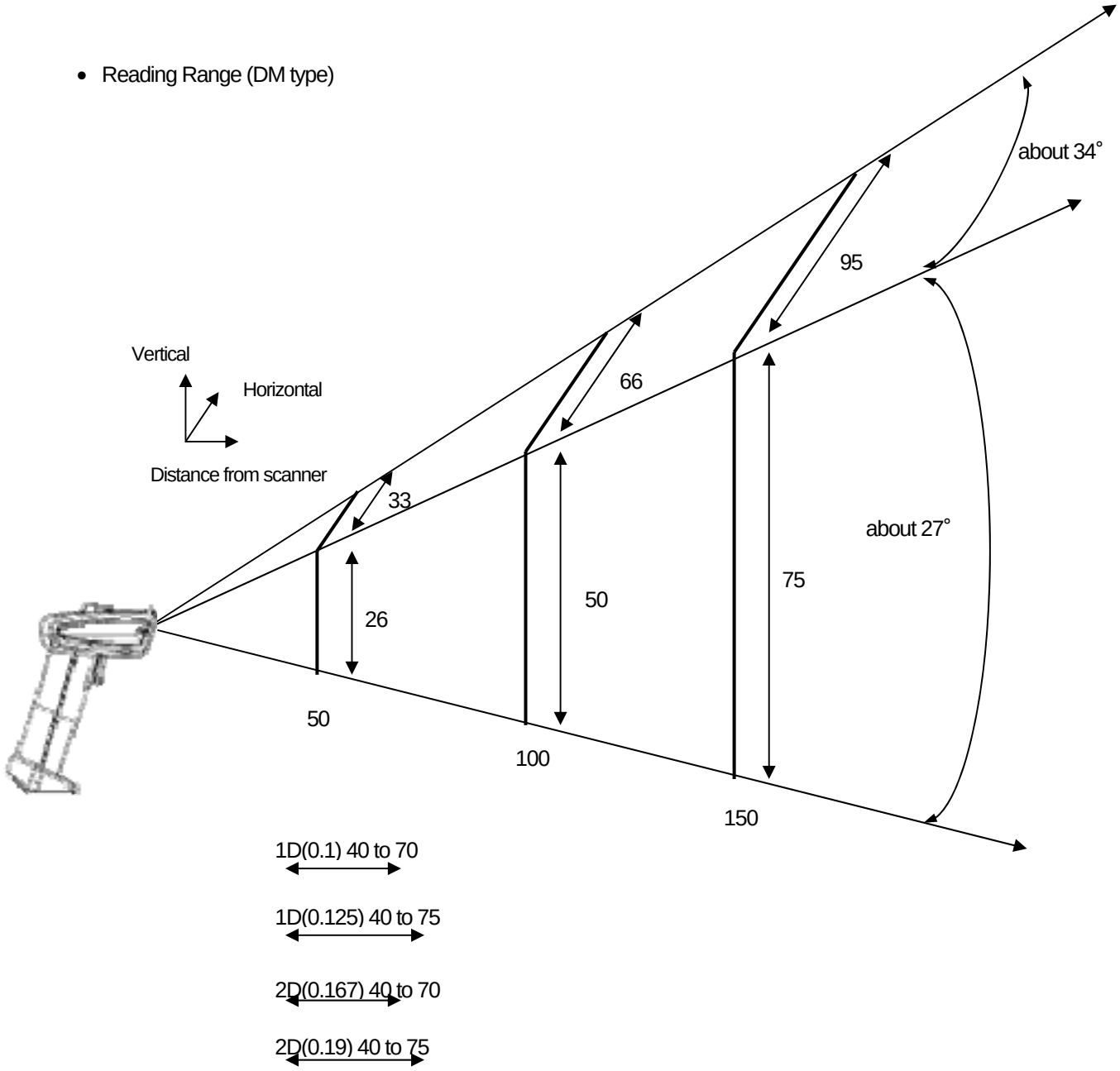
- Reading Range (High density type)



unit : mm

- Reading ability depends on environment (brightness etc) and the printing quality of scanned barcodes.
- Measured in 500 to 1000(lx) of homogeneous brightness, printed with good quality, no pitch and no skew.

- Reading Range (DM type)



unit : mm

- Reading ability depends on environment (brightness etc) and the printing quality of scanned barcodes.
- Measured in 500 to 1000(lx) of homogeneous brightness, printed with good quality, no pitch and no skew.

5.4 Default settings

When the unit is shipped from the factory, the initial setup is as follows:

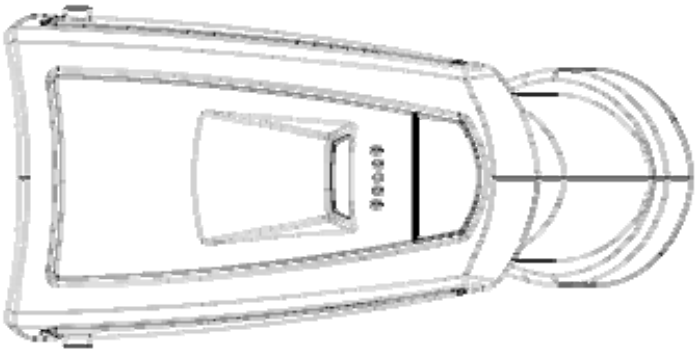
- THIR-6000B, THIR-6000HB → Enabled Symbols: all symbols.
- THIR-6000DM-B → Data Matrix (ECC200) and QR Code

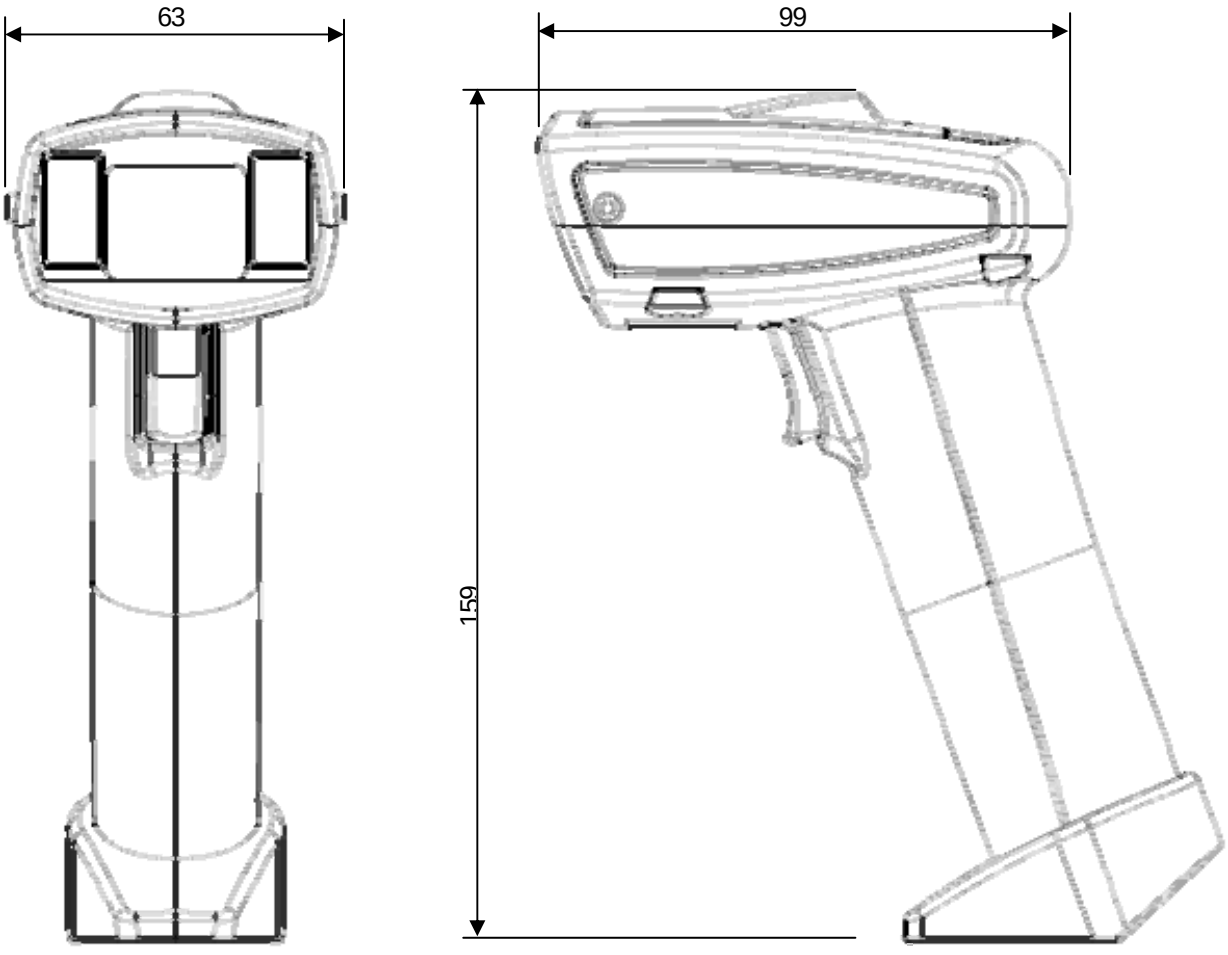
Security settings

As the default, security settings are not configured. Please see “7.4 How to configure security settings”.:

6. Dimensions

6.1Housing Dimensions





Unit: mm

7. Special Functions

7.1 Cropping Function

Cropping is a method to remove unwanted areas from the image in order to make the image smaller.

The following is the procedure to set up this function through the serial interface.

Confirming the cropping status

Serial Command ?IMG<cr>

<< Example of reply>>

```
******** STATUS ******** THIR-6000
 BBC=0  0:256 1:16 2:RLE 3:AVE 4:AVERLE 9:Color
 IMODE=0  PX=0  PY=0  WX=1280  WY=1024
 CAPMODE=0,0,1280,1024
 CAPX=0 ( 0:100%, 1:75%, 2:50%, 3:25% )
 CAPY=0 ( 0:100%, 1:75%, 2:50%, 3:25% )
 VMODE=0 (0:Mono 1:Color )
********* END ********** THIR-6000
System version = K85C-V1.0c
Decode version = K85A-V1.0c
```

} Cropping status is bolded..

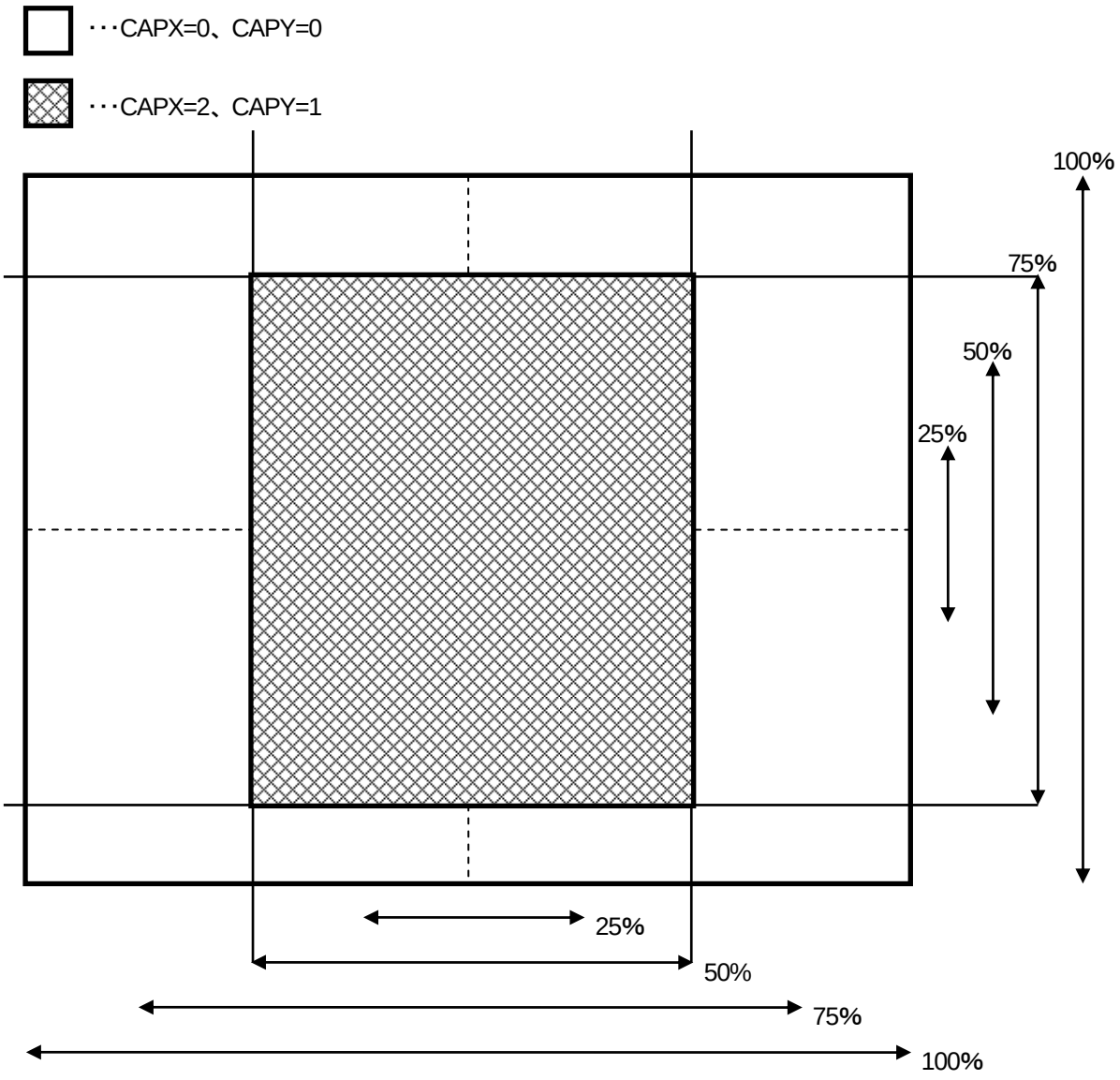
【 Setting for

Serial Command CAPX=*m*, CAPY=*n* (*m,n*=0,1,2,3)

<< Value >>

0…100%
1…75%
2…50%
3…25%

Cropping Area



7.2 Auto detection mode

7.2.1 Overview

By using this mode, the THIR-6000 can read and decode symbols automatically.

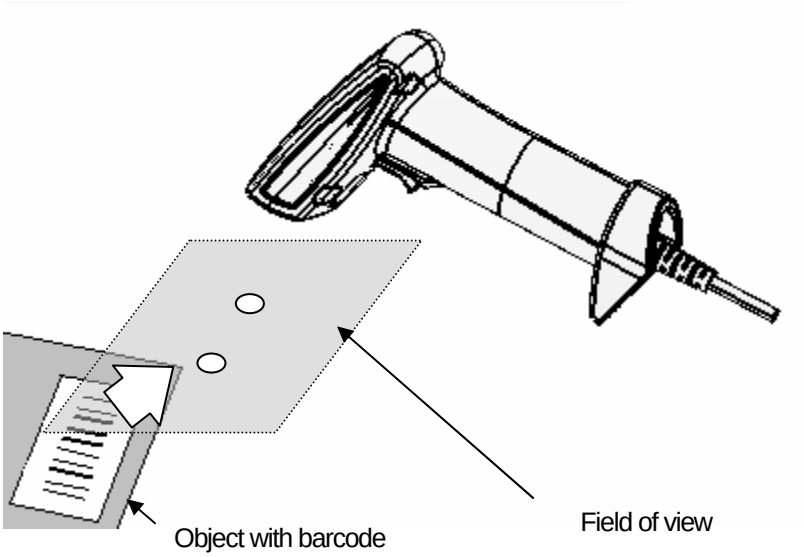
The THIR-6000 detects changes of image in its field of view, such as changes in ambient brightness and motion of objects. When there is such a change, the THIR-6000 starts to capture an image and decode it.

This function is designed for stand mounting use to read documents with printed barcodes. For example, it is suitable for using on the counter at post office.

CAUTION

In Auto Detection mode the trigging switch does not work, neither does image capture, HEX program reception, or Macro program execution. Please turn the Auto Detection mode OFF if those function are needed.

Auto Detection mode may not work well under excessivey bright, dim, or intermittent lighting..



Note

- Auto Detection mode is not a default setting. To change to Auto Detection mode, have the THIR-6000 read the corresponding configuration barcode.
- The THIR-6000 does not vibrate when it decodes a symbol successfully in the Auto Detection mode regardless of the current vibration setting.

7.2.2 How to use

(1) Bring the reader within the reading range of the barcode with the monitor LED lit orange, and the pointer LED flashing red.

(2) Position the label barcode near the center of the two pointers.

(3) Reading will begin once the reader has detected the label.

(4) Once the reader has finished reading the barcode, the monitor LED will light up green, and a single beep will sound. However, when the same barcode is rejected to the consecutive read prohibition, the monitor light will be red and two beeps will sound.

(5) In addition, if the barcode cannot be read within the reading timeout (default setting: 1 sec.), reading will be finished,

(6) After the conclusion of reading, remove the label from the reading range.

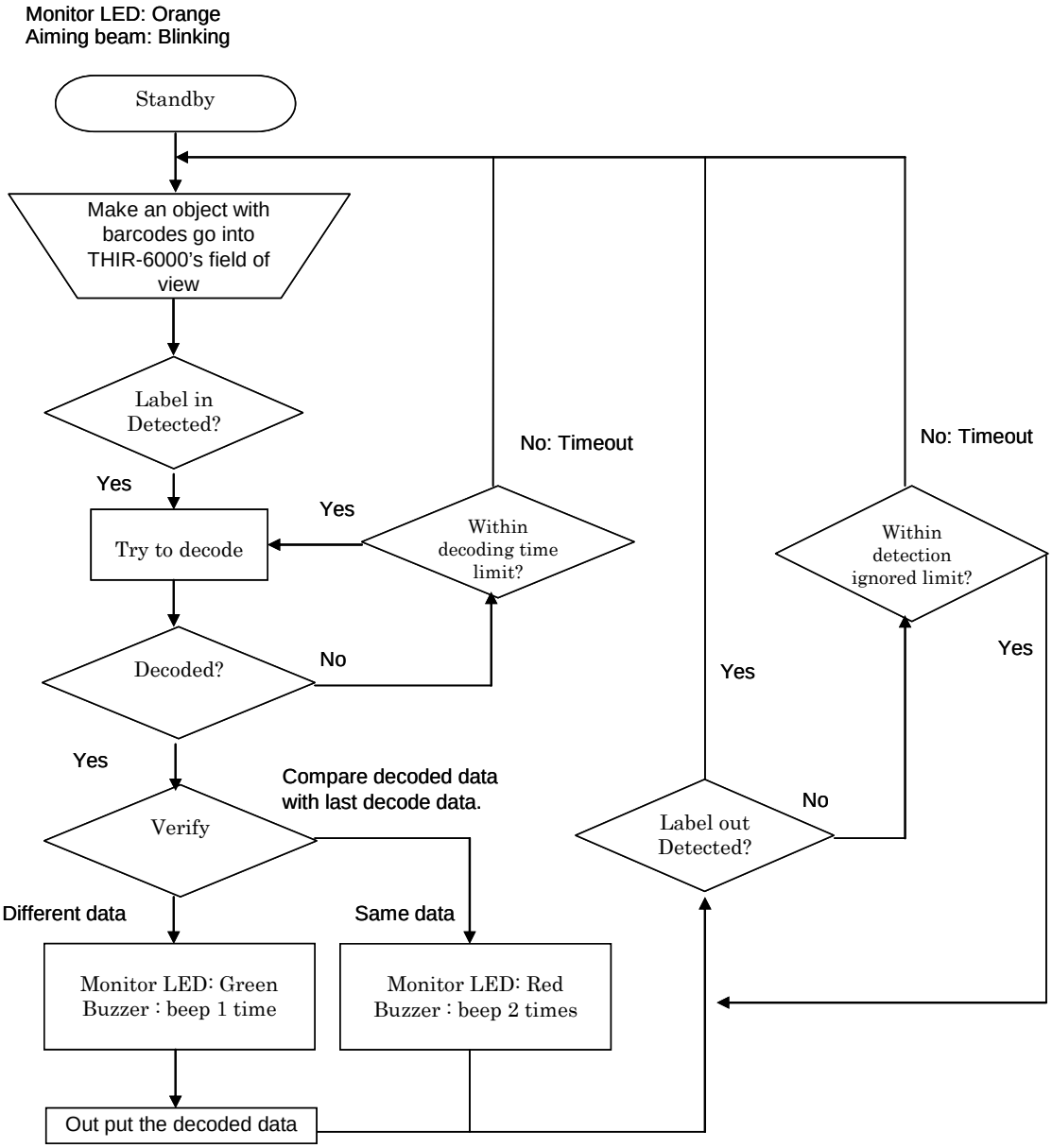
(7) When the reader detects a missing label, (return to (1) and proceed with reading the next label. Even if the missing label could not be detected within the missing label timeout time (default value: 0.5sec.), return to (1) and proceed with reading the next label in the same manner. A missing label timeout will result if the label is removed during barcode reading, or if the label is placed as is after reading.

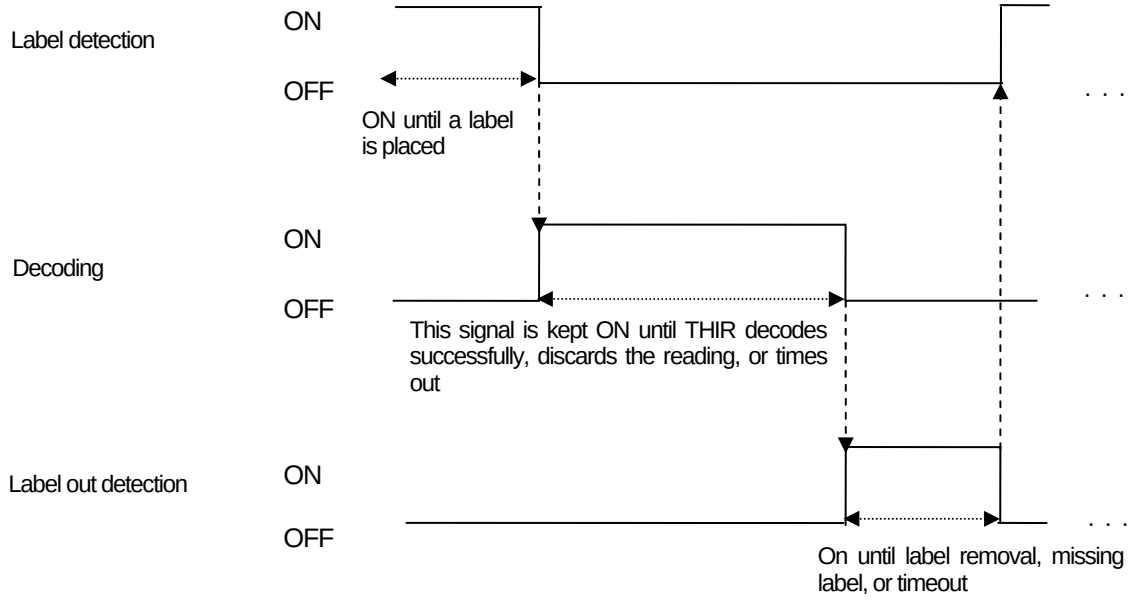
(8) See the operation timing chart for details on the operation content.

- If reading is not possible even with a label in place…

Remove the label temporarily, and wait until the monitor LED turns orange (as in (1)).

The flow chart of Auto Detection mode





Operation Timing chart

7.3 For high density barcodes

The HD mode is designed to read high density barcodes (cell size under 0.167mm) more quickly. Since this is not a default setting, please change to HD mode by reading the corresponding configuration barcode.

7.4 How to configure security settings

Serial command

?	Show status data string1 If the data is correctly received, THIR-6000B is connected to the host computer.
PIN CODE=XXXX	Put 4 digit numeric to "XXXX".

Bluetooth connection will be disconnected when PIN CODE is set. Please enter the PIN CODE to connect again. Setting the PIN CODE as "0000", disables security.

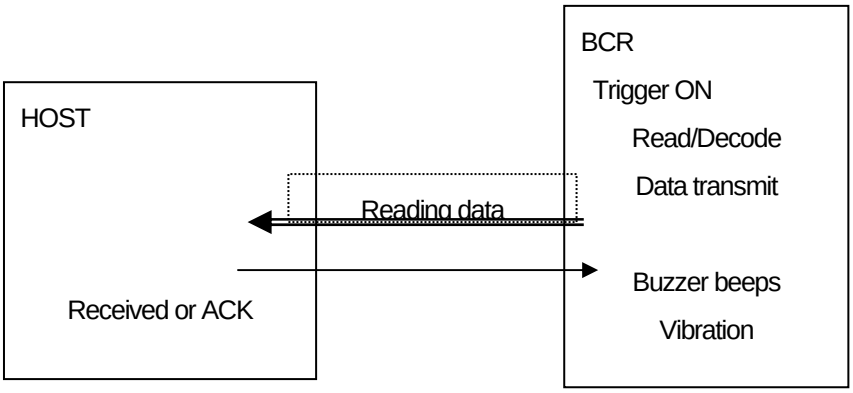
WSETS	Write settings to THIR-6000's flash memory (make sure the connection is established)

7.5 How to confirm data transmission

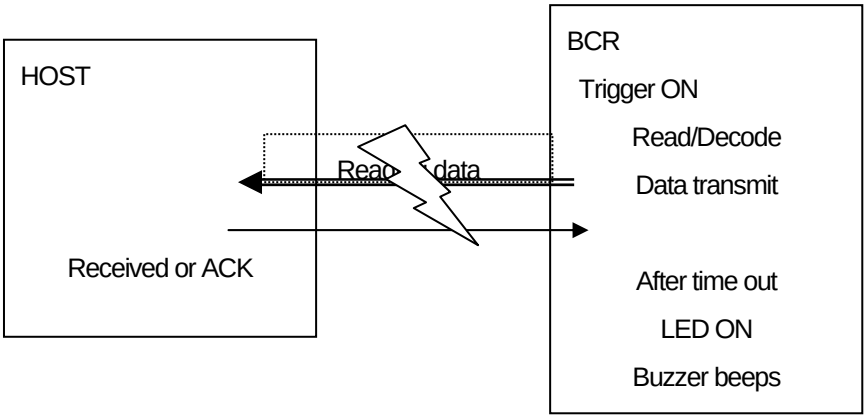
The following method is strongly recommended to ensure data communication
It will take approx. 20 second to detect disconnection between the THIR-6000 and the host computer caused due to the reader leaving the area, etc.. Data sent during this period will be lost as it cannot reach the host computer. By using the following method to confirm that the transmitted data is successfully received, thereby preventing data loss..

After sending data, the THIR-6000B waits for a response from the host for a set time (communication timeout period), and it determines that the data was received normally by receiving the reception command from the host. . The THIR-6000B will determine the data to be lot if no command is received within this time..
The user can be informed of the result of a data reception determination by a buzzer, LED, or vibration.
To use this function, the host must send a “received” or ACK (0x06) command to the THIR-6000B after receiving data from the scanner.

(1). Normal flow



(2)In case of NG



- How to switch confirmation ON ←→ OFF
  1) Configuration barcode menu (Other document) → By reading barcodes
  2) By sending serial command

  ANSWERBACK=X Confirmation ON/OFF 0: OFF (Default) 1: ON

  ANSWERBACKTIM=X Time out limit 1~3 second (Default:1)

- How it works
  The THIR-6000B, having sent reading data, waits for a "received" command from the host within the timeout limit.
  The trigger signal and other serial commands are disabled during this period.
  The trigger signal and other serial commands are enabled after receiving a "received" command or at timeout.

- During the reception check timeout period, the "received" command will
  1). If received → Message OK to the operator by a buzzer or vibration.
  2). If not received → NG will be messaged to the operator by a buzzer or red LED

	Buzzer	LED	Vibration
OK	2 times (high tone)	non	100msec
NG	3 times (low tone)	Red LED ON (700msec)	non

7.6 Image preprocessing

Article	Command	Contents
Image Preprocessing	?PROC	Indicates the status of a image pre-processing setting contents
	IPFUNC0=a1,a2,a3,a4,a5	No.0 Image Preprocessing Setting
3x3 Mask Filter	FILTER33[I] [j]=a FILTER33DM=1-10000	Set coefficient value of 3x3 mask filter. (i, j=0 through 2, a= -99 through +99) Set magnification value of 3x3 mask filter.
5x5 Mask Filter	FILTER55[I] [j]=a FILTER55DM=1-10000	Set coefficient value of 5x5 mask filter. (i, j=0 through 2, a= -99 through +99) Set magnification value of 5x5 mask filter.

Article	Command	Description
None	0	No Image preprocessing
Black Erosion	1	Erosion 2x2
	3	Erosion 3x3
	5	Erosion 5x5
	7	Erosion 2x1 (w)
	9	Erosion 1x2 (h)
White Dilation	2	Dilation 2x2
	4	Dilation 3x3
	6	Dilation 5x5
	8	Dilation 2x1 (w)
	10	Dilation 1x2 (h)
Reverse	20	Reverse White & Black
Contrast Enhancement 21&22 are used to enhance black 23&24 are used to enhance white	21	Cont (L12cut): Cut the lest (from the darkest) 12.5%
	22	Cont (L22cut): Cut the lest (from the darkest) 25%
	23	Cont (H23cut): Cut the most (from the brightest) 12.5%
	24	Cont (H24cut): Cut the most (from the brightest) 25%
	25	Cont (LH12cut): Cut the lest 12.5% and the most 12.5%.
	26	Cont (LH22cut): Cut the lest 25% and the most 25%.
Gamma Correction	27	Gamma(r=0.5) Execution for Gamma Correction 0.5
Smoothing Filter	40	Low pass Filter 3x3 average value
Median	41	Median filter 3x3 median value
3x3 Filter	60	3x3 filter FILTER33, FILTER33DM execution filtering by command
5x5 Filter	61	5x5 filter FILTER55, FILTER55DM execution filtering by command
Down Size	70	Down Size (Quick) Down size whole image with quick mode
Down Size	71	Down Size (Average) Down size whole image with average speed mode

Please ask our sales department for more information.

8. Troubleshooting

8.1 The LED pointers do not light up even when pushing the read trigger switch.

Is the battery charged?

The THIR-6000B may not operate correctly with insufficient battery charge.

Please see "2.1 Charging battery".

8.2 Cannot charge battery

Is the THIR-6000B placed on the cradle correctly?

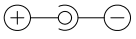
Charging is not possible if the THIR-6000B is placed on the cradle incorrectly. Please see "2.1 Charging battery".

Is the AC adapter inserted correctly?

Charging is not possible if the AC adapter is incorrectly inserted into the cradle.

Is power supply polarity correct?

Charging will not be possible if the polarity is reversed.

Correct polarity → 

Is the power rating of the power supply enough?

Charging will not be possible unless the capacity of the power supply is sufficient.

are the charging terminals clean?

Charging will not be possible if there is grime on the charging terminals. Periodically clean with a cotton swab wetted with a neutral detergent or ethanol.

Is the battery old?

- The rechargeable battery is a consumeable item. The battery has likely reached the end of its lifetime if the usage time after charging has become noticeably shorter. A good rule of thumb for battery lifetime is around 300 discharge/recharge cycles, or two years of use under proper usage conditions. Contact our sales department for replacement batteries.

8.3 Barcode Cannot be Read.

Is there beep from the buzzer when the THIR-6000B reads a barcode?

YES → Barcode is decoded, but an error has occurred in Bluetooth data transmission. Please see "8.4. Errors in transmitting data".

NO→ Barcode is not decoded. Please see the following troubleshooting guidelines.

Is the code setup correct?

Barcodes outside the settings are not readable if the corresponding barcode or number of digits is delineated.

Perform barcode and digit settings as needed as per "Barcode Menu Setup".

Is reading distance suitable?

Reading may be impossible when the reading distance is outside the working range or reading depth. Moreover the printing quality of the code may make it non-readable even if it is within the reading range limits. See "5.3 Reading Range/Depth".

Is the surface of the barcode glossy?

If the surface of the barcode is glossy, the illumination will be sometimes reflected like a mirror.

To avoid this, put the scanner in angle relative to the barcode.

Is the reading window clean?

If the window becomes dirty or stained, the illumination will be dimmed, distorting and dimming the image taken by the reader. Clean with a lens cleaner or similar anti-scratching (non-abrasive) method.

Is the print quality of the code good?

Please check that the basic width/length ratio conform to the standard for 1-dimensional barcodes, as well as the cell arrangement, code size, etc., for two-dimensional codes. Low-quality barcodes with faded, missing, or soiled printing may also not read.

8.4 The data does not transmit or the data itself is corrupted.

Is the Bluetooth adopter connected to the host computer?

USB Bluetooth adapter

Please check if the wireless unit TMU-6000 has a Bluetooth adapter or not and that the wireless unit USB cable is connected to USB port of the host computer. If TMU-6000 is not used, please check if the Bluetooth adapter is inserted to USB port of the host computer.

Serial Bluetooth adapter

Please check if the Bluetooth adapter is inserted to serial connector of the host computer.

8.5 Reading data gets garbled

Did you indicate a fixed number of digits for ITF?

In some cases, dropping of digits (Reading fewer digits than the indicated number of digits) may occur in ITF (Interleaved 2 of 5) . We recommend setting specific number of digits for ITF.

8.6 Bluetooth connection is disconnected

Is THIR-6000B in the range or Bluetooth connection?

The Bluetooth area generally has a radius of around 10m from the Bluetooth adapter, but the distance varies depending on the use environment. Please check wave strength if prone to disconnection. The reader 'status" can be selected and the strength checked, in the utility screen of the Bluetooth driver. If it is weak, install a Bluetooth adapter for the wireless unit (TMU-6000) in a location with good visibility .

8.7 Reading drops occur

Is there a disconnection during transmitting?

Reading data can be partially dropped if the connection fails during the transmission. Check the connection between the reader and the Bluetooth adapter. See "2.2 Setting up the host computer" for the connectivity check method.

8.8 Keyboard wedge interface is needed

If keyboard wedge software is installed to the host computer, the THIR-6000B can be used as a keyboard interface device. Please let our sales department know if keyboard wedge is needed.

8.9 PIN CODE is required when Bluetooth connection is established

The PIN CODE is not set at the time or shipment from our factory. To initialize the PIN CODE setting, see 'Setting default settings" in the "Configuration Barcode Menu".

See "7.4. How to configure security settings" if a PIN CODE is to be used.

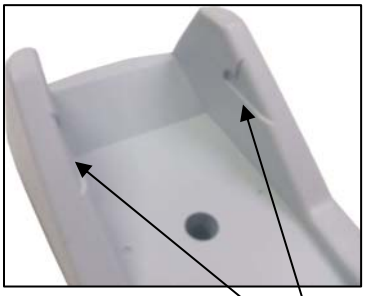
Appendix 1 Cradle（TBC-6000）

1. Overview　　Cradle for THIR-6000B series
2. Specifications

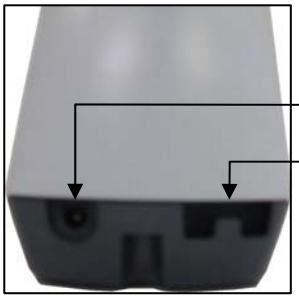
Dimensions　　: 72(H) × 90(W) × 241(D)
Weight　　: Approx. 215g (AC adapter, wireless unit, and THIR-6000B are not included)
Tap Holes　　: ϕ5 x 3
Screws　　: M4 × M20　2pcs (comes with the cradle)

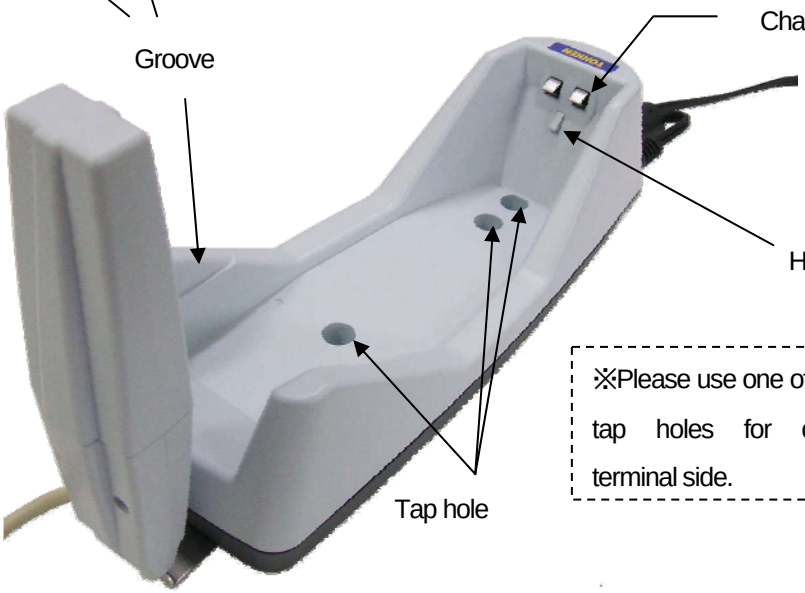
3. Appearance

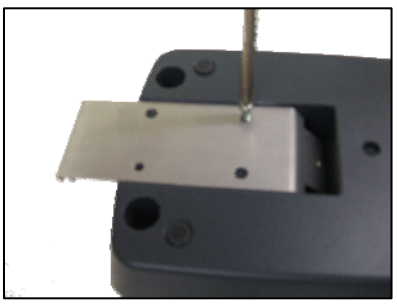
Edges



Rear







Fix the metal plate

Hook the cable of AC adapter

Appendix 2 Wireless unit（TMU-6000）

1. Overview

   This unit optimizes the distance and range of connection when installed in a location with good electromagnetic visibility. It can be attached to the cradle or walls, desks etc.

2. Specifications

   - Dimensions : 145(H)×30(W)×95(D)mm
   - Weight : Approx. 125g (Including cable)
   - Length of cable : 2m
   - Tap holes : φ3 x 2 φ4 x 2
   - Screws : φ2.6 ×8 2pcs

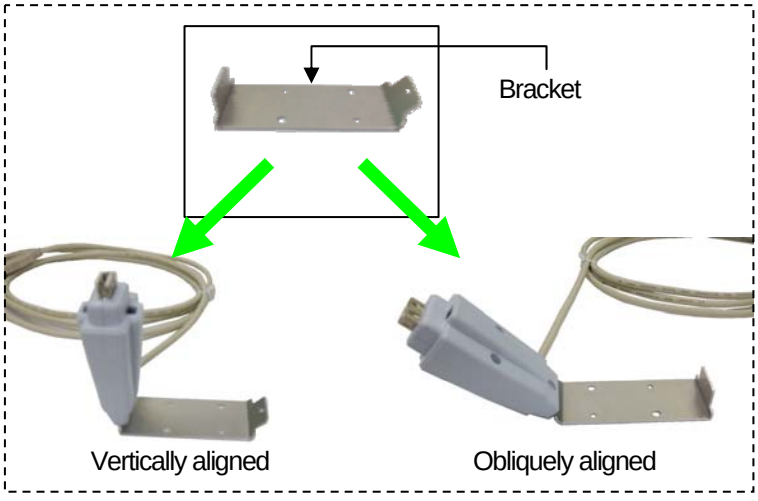
   *These screws are used when the unit is attached to the cradle (TBC-6000).

   *In this case, please use two φ3 tap holes.

3. Appearance

Wireless Unit

Examples of bracket use



Appendix 3 Wireless adapter（TMA-6000(U)）

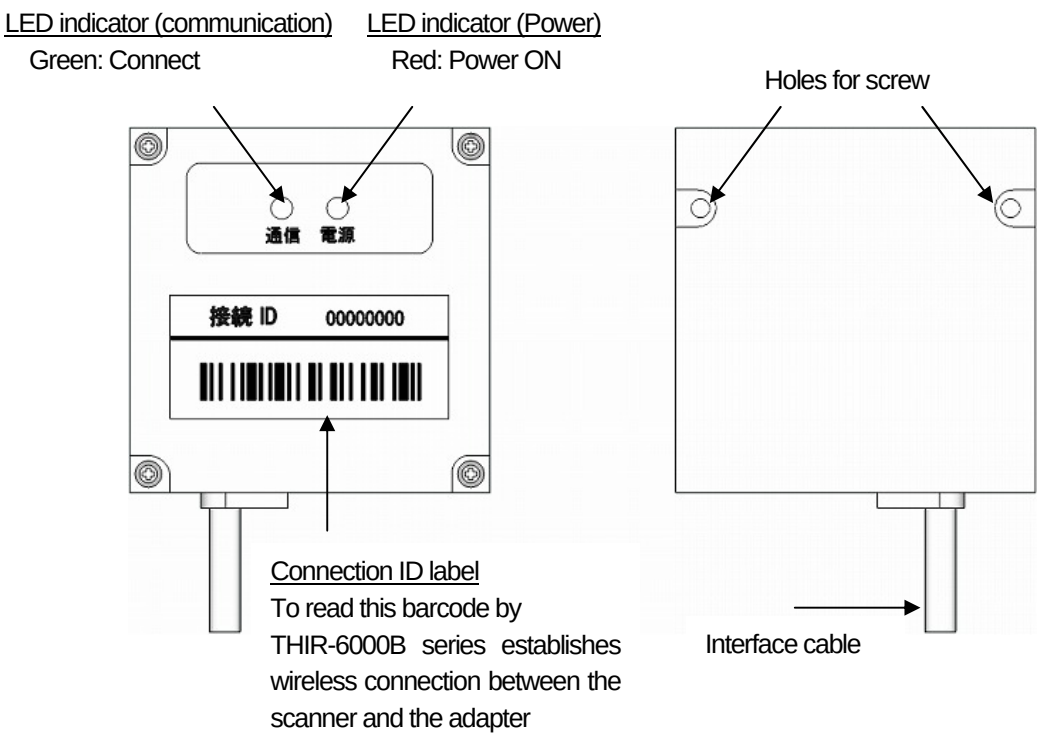
1. Overview

This unit is used for Bluetooth communication between THIR-6000B series and host PC. By reading the barcode label placed on the housing of TMA-6000, the scanner and the adapter establish Bluetooth connection. Both USB and RS-232C interfaces are available.

Model	Interface	Description
TMA-6000	RS-232C	Needs AC adapter
TMA-6000U	USB	Works as keyboard wedge. Send reading data to the host PC as if the data is input by using keyboard. Windows2000 or XP is required as OS of the host PC

* “TMA-6000 and TMA-6000U Wireless Adapter Connection Instruction” contains how to use and configure them.

2. Components



3. Specification

Item	Specification
Dimensions	58(H)×59(W)×24(D) [mm]
Weight（Except cable）	50g
Power	5.0V±10%
Power consumption (adctive)	150mA@5V
Wireless interface	Bluetooth 2.0　Class1
Maximum distance of connection (reference)	100m without any objects between the host and the scanner (Varies by the presence of objects (Walls, metal, human and etc.)　and condition of environmental signal noise.
Wired interface	・RS232C type：　RS-232C(Dsub9p) ・USB type：　　USB1.1(A plug) * USB I/F requires Windows2000 or XP
Holes for screw	M3, depth 5mm, 2 locations
Environmental specification	Pursuant to THIR-6000 series'

4. Unpacking

Component	Qty
TMA-6000 (including interface cable)	1 set
Connection ID label (spare)	1 sheet
Rubber foot	4 pieces
TMA-6000 connection instruction	1 copy

5. Pin out of connecter

5.1 RS-232C type　　D-Sub9 female

No.	Signal	Description
1	NC	No connection
2	TxD	Serial data transmit data output
3	RxD	Serial data receive data input
4	NC	No connection
5	GND	Ground
6	NC	No connection
7	CTS	Clear to send (input)
8	RTS	Request to send (output)
9	NC	No connection

5.2 USB type　　USB connecter A plug

6. Default settings

6.1 TMA-6000 (RS-232C type)

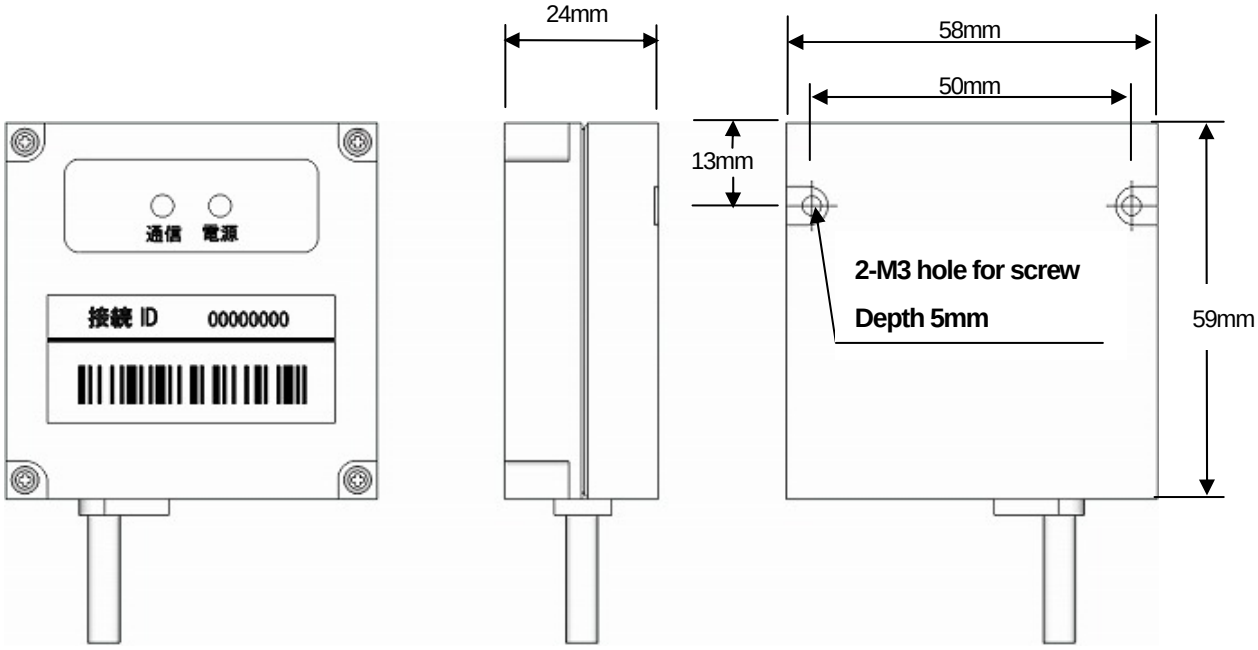
Function		Default value
Baud rate		9600 bps
Frame structure	Data length	8
	Parity bit	None
	Stop bit	1
Flow control	RS/CS control	None
	ACK/NAK control	Nonw
	Time out for response	1 second

6.2 TMA-6000U（USB type）

Function	Default value
Keyboard language	Japanese
Interval of data transmission	10ms
Caps Lock	No
Num Pad	No
Case conversion	No

7. Outlook

7.1 Dimensions



[Memorandum]

Warranty Obligations

Except for cases specifically mentioned in an estimate contract or specification, TOHKEN warrants this product as follows.

1. Term of warranty

   One year from the date of purchase.

2. Warranty Coverage

   TOHKEN will repair or replace the product at no charge for faults on the part of the company. The losses incurred due to the failure of this product are excluded from this warranty. However, faults of the following type are outside the warranty.

   (1). Handling or use of the product under conditions or an environment not in accordance with the catalog, user's manual, etc.

   (2). If the product is modified or repaired by any outside party.

   (3). If not caused by the product itself.

   (4). If the defects are caused by *force majure*, beyond the responsibility of TOHKEN, such as fire, natural disaster, etc..

3. Usage outside of Japan

   This warranty coverage presumes use in Japan. Please contact our sales department if there need to use this product outside of Japan.

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