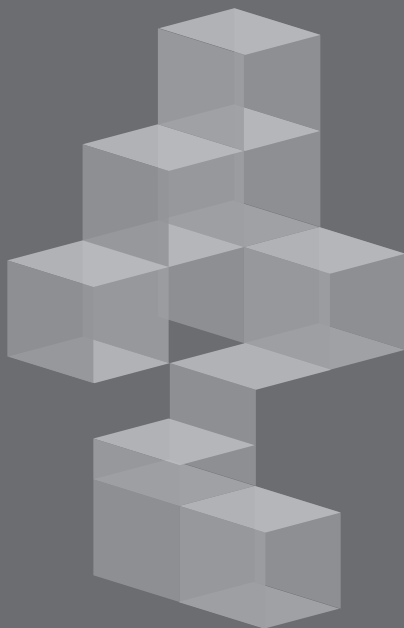# Quick Start Guide
FM400 Series

FIXED MOUNT SCANNER

FUZZYSCAN

cino

Getting Familiar with Your FuzzyScan

Thank you for choosing Cino FuzzyScan FM400 Series Fixed Mount Scanner. Integrated with the innovative FuzzyScan 2.0 Imaging Technology and durable ultra-compact design, FM400 series not only provides outstanding reading performance, but also meets various demands for both industrial and general purpose applications. This document provides a quick reference for installation and operation purpose. The complete documentation is available at **www.cino.com.tw**.

FM400 Series (Front-view Model)
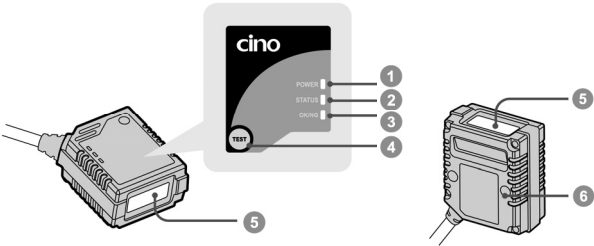
FM400 Series (Side-view Model)
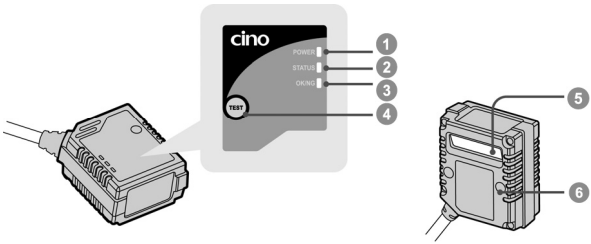
1 Power Indicator		**4** Test Button	
2 Status Indicator		**5** Scan Window	
3 OK/NG Indicator		**6** M3 Mounting Hole	

Connect to Your Host

Both RS232 and USB interfaces are available in different models of FM400 series. Each model is equipped with corresponding connector to meet various application demands.

USB Models (FM4xx-11x)

The USB models provide a plug-and-play solution. Both USB HID and USB COM Port Emulation interfaces are available for user's choice.

4-pin Type A Connector

Pin No.	Signal	Description	I/O Type
Case	FG	Frame Ground	---
1	VCC	---	I
2	Data -	USB Data -	I/O
3	Data +	USB Data +	I/O
4	GND	---	---

RS232 Models (FM4xx-00x)

The RS232 models support the standard RS232 interface equipped a 9-pin D-sub connector with power jack for external 5Vdc power inlet.
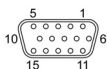
9-pin D-sub Female Connector

Pin No.	Signal	Description	I/O Type
Case	FG	Frame Ground	---
1	---	---	---
2	TXD	Transmit Data	O
3	RXD	Receive Data	I
4	---	---	---
5	GND	Signal Ground	---
6	---	---	---
7	CTS	Clear to Send	I
8	RTS	Request to Send	O
9	VCC	5Vdc Power Supply	I

Universal Models (FM4xx-98x)

The universal models support RS232 and USB interfaces with OK/NG signal outputs and external trigger input.

15-pin D-sub HD Female Connector

| Pin No.	Signal	Description	I/O Type
1	VCC	5Vdc Power Supply	I
2	TXD	Transmit Data	O
3	RXD	Receive Data	I
4	GND	Signal Ground	---
5	---	---	---
6	RTS	Request to Send	O
7	OK	OK Signal Output (3-24Vdc)	O
8	Data +	USB Data +	I/O
9	Trigger	External Trigger Input	I
10	CTS	Clear to Send	I
11	---	---	---
12	Data -	USB Data -	I/O
13	Shield	Frame Ground	---
14	NG	NG Signal Output (3-24Vdc)	O
15	Reserved	---	---

Install Your FuzzyScan

Adjust Reading Angle

The readability may be impacted by the specular reflection caused by the perpendicular reading angle. To get the most optimal reading performance, you are suggested to install the FM400 at an approximate **15°** angle to the perpendicular line of the target barcode. However, the reading angle and distance may vary depending on the size and printing quality of barcodes.

Front-view   **Side-view**
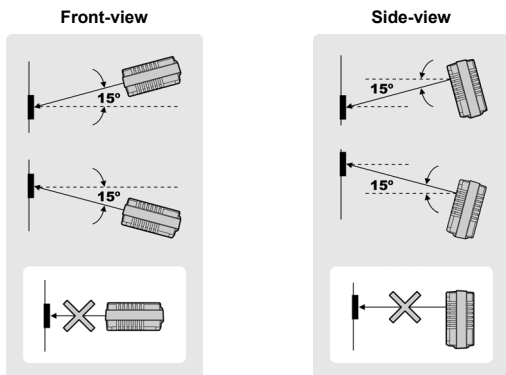
Mount Your FuzzyScan
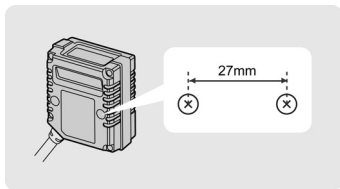
There are two **M3** mounting holes on the bottom of the chassis. Please follow below procedures to mount your scanner.

1 Prepare two appropriate M3 screws (minimal 4mm in depth) and decide your desired mounting location. Then adjust the two screws to accommodate **27mm** center width.

2 Optimize the mounting position by adjusting the reading angle and distance. Ensure the illumination envelop is not blocked by any external object.

3 Use the test mode to verify the actual reading rate. If the reading rate is not good enough, please adjust the reading angle and distance to get the optimum readability.

Use the Test Mode

The FuzzyScan FM400 provides an useful test mode which is helpful for you to quickly identify the best mounting position. Please refer to the descriptions listed below for details.

Test Button

Under normal operation, the Test Button of FM400 just acts as a normal trigger switch of hand-held scanner. You can press the Test Button to scan the corresponding barcode commands to configure your scanner with ease.

✍ **Please note that if you press the Test Button over 5 seconds, the FM400 will enter the test mode automatically.**

Test Mode

Once determine your desired location to install the scanner, you may use the test mode to optimize the mounting position with ease. Please follow below procedures to use the test mode.

1 Hold the Test Button over **5** seconds until the status indicator gives one green blink, then release the button to activate test mode. The scanner will give 2 short beeps and the power indicator will flash blue blink per 1 second. The scanner will turn on the light source to scan barcodes continuously before exit the test mode.

2 Keep scanner to read the same test barcode. The scanner will count the **Good Read** numbers, then output the information of reading rate and refresh LED indications every 100 scans. The format of output message is listed below.

> **< Readout data >   :   < Reading rate (0 to 100) >**

At the same time, both Status and OK/NG indicators will provide the visible reading rate information as well. You may refer to the table listed below for details.

Reading Rate	Status Indicator	OK/NG Indicator
100%	Steady Green	Steady Green
80 to 99%	Steady Red	Steady Green
50 to 79%	Steady Green	Steady Red
20 to 49%	Steady Orange	Steady Orange
0 to 19%	Steady Red	Steady Red

3 If the reading rate is not good enough, please adjust the reading angle and distance to get the optimum readability. If you would like to exit the test mode, please press the Test Button once again.

✍ **1. If the scanner is unable to read any barcode during preset scan input time-out (default is 900ms), the scanner will count it as a NG reading.**

2. Under test mode, the OK/NG output signals will not be performed.

Use Your FuzzyScan

Both FuzzyScan **Barcode commands** and **Serial commands** are available to configure your FM400. The FuzzyScan barcode commands are a series of proprietary barcodes which allow you to easily configure the scanner for most applications. Moreover, the FuzzyScan serial commands are ideal for precise and complicated reading control in machine-controllable environments. Please refer to the relevant documentations for details.

External Trigger and Serial Trigger

The FM400 provides both external trigger and serial trigger to activate the scanning processes. Please note that the external trigger is available for universal models only. The serial trigger is one of serial commands available for all models including RS232 serial and USB COM Port Emulation interfaces.

Scan Input Time-out

The scan input time-out is a preset light source on time available for presentation, alternative and level modes. The scanner keeps the light source on and continues to scan until the preset scan input time-out is up. You can adjust the time-out duration from 100 milliseconds to 99 seconds to meet various application demands.

OK and NG Outputs

The universal models provide additional OK and NG outputs for more precise reading control. If the scanner got a good read, a signal will be outputted through scanner OK pin. However, if the scanner failed to read the barcode during a reading cycle or preset scan input time-out, a signal will be outputted through scanner NG pin.

The OK and NG outputs are designed as **NPN** signal outputs and have been preset to active low. If necessary, you are able to change the active state of OK and NG outputs to meet your applications.

Operation Modes

The FuzzyScan FM400 series provides five different operation modes, including trigger, alternative, level, presentation and force modes to meet various application demands.

Both the presentation and force modes support **triggerless** operation, you don't need to use either external trigger or serial trigger to activate the scanning. But the trigger, alternative and level modes **have to** work with **external trigger** or **serial trigger** to scan barcode.

||| |||| |||||||||||| ||| |||

Trigger mode

Under trigger mode, the scanner will turn on the light source to read barcode when it receives an external trigger or a serial trigger ON command. Once the external trigger has been released, or the scanner gets a good read or a serial trigger OFF command, the scanner will stop reading and wait for the next trigger to activate scanning again.

||| |||| ||||||||||||| |||

Alternative mode

When the scanner receives an external trigger or a serial trigger ON command under alternative mode, the scanner will turn on the light source to read barcodes until the **preset scan input time-out** is up. The scan input time-out will be reset after each good read. Once the light source goes off, the scanner is waiting for the next trigger to activate scanning again.

||| |||| ||||||||||| ||| |||

Level mode

When the scanner receives an external trigger or a serial trigger ON command under level mode, the scanner will turn on the light source to read barcodes until **a good read** is performed or the **preset scan input time-out** is up. Once the light source goes off, the scanner is waiting for the next trigger to activate scanning again.

||| |||| ||||||||||||| |||

Presentation mode

Under presentation mode, the scanner will automatically detect the object movement in the scanner field of view. Once the scanner detects a similar barcode image, the scanner will turn on the light source to read barcodes until the **preset scan input time-out** is up. For dark environments, you may adjust the setting of "Presentation Sensitivity" to increase the detection sensitivity.

||| |||| ||||||||||||| |||

Force mode

Under force mode, the scanner continues to read barcodes without using external trigger or serial trigger. Please note that the scanner will not stop reading until you switch into another operation mode.

Host Interface Quick Set

||| ||| ||||| ||| ||| |||
RS232 Serial

||| ||| |||| ||| ||| |||
USB HID Turbo Mode

||| ||| ||||| ||| ||| |||
USB HID Standard Mode

||| ||| ||||| ||| || |||
USB Com Port Emulation

USB HID Interface Quick Set

- Record Suffix -

||| ||| ||||||| ||| ||
None

||| ||| |||||| ||| |||
TAB

||| ||| ||||| |||| |||
ENTER

||| ||| |||||| ||| |||
RETURN ◆

||| ||| ||||| ||| |||
SPACE

- Keyboard Layout -

||| ||| |||| ||||| |||
USA ◆

||| ||| ||||| ||| |||
Germany

||| ||| |||| || ||| |||
Canadian French

||| ||| ||||| ||||| ||
Latin America

||| ||| ||||| ||||| |||
Japan

||| ||| |||| |||| |||
France

||| ||| |||||| ||| |||
United Kingdom-UK

||| ||| |||| ||||| |||
Spain

||| ||| |||| ||||| |||
Nertherlands

Serial Interface Quick Set

- Record Suffix -

None

CR ◆

LF

CRLF

TAB

SPACE

- Baud Rate -

38.4K BPS

19.2K BPS

9600 BPS ◆

4800 BPS

2400 BPS

1200 BPS

600 BPS

300 BPS

- Data Frame -

8, None, 1 ◆

8, Odd, 1

8, Even, 1

8, Space, 1

8, Mark, 1

8, None, 2

7, Odd, 1

7, Even, 1

7, Space, 1

7, Mark, 1

7, None, 2

7, Odd, 2

7, Even, 2

7, Space, 2

7, Mark, 2

System Commands

```
PROGRAM
(Enter Programming Mode)
```

```
END
(Exit Programming Mode)
```

```
System Information
```

```
Factory Default
```

```
Master Default
```

```
PowerTool Host Link
```

```
Save User Default
```

```
User Default
```

USB HID Interface Control

Command	Parameter Selection		Option Code	
Keyboard Layout	USA ◆ France Germany United Kingdom-UK Canadian French Spain Sweden/Finland Portugal Norway	Latin America Italy Netherlands Denmark Belgium Switzerland-Germany Iceland Japan Universal	00 01 02 03 04 05 06 07 08	09 10 11 12 13 14 15 16 99
Record Suffix	None RETURN ◆ TAB SPACE	ENTER User define character	0 1 2 3	4 5
Preamble	None ◆ 1-15 characters		FIN [00-7F], [FIN]	
Postamble	None ◆ 1-15 characters		FIN [00-7F], [FIN]	
Intermessage Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Intercharacter Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Interfunction Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Caps Lock Control	"Caps Lock Off" State ◆ "Caps Lock On" State Auto Detect		0 1 2	
Caps Lock Release Control	"Caps Lock On, Caps Off" ◆ "Caps Lock On, Shift Off"		0 1	
Function Key Emulation	Enable ASCII 00-31 as KB function code output ◆ Enable ASCII 00-31 as Ctrl-xx output		0 1	
Key Pad Emulation	Disable key pad emulation ◆ Enable numeric output as key pad output		0 1	
Upper/Lower Case	Normal case ◆ Inverse case Upper case Lower case		0 1 2 3	

Serial Interface Control

Command	Parameter Selection		Option Code	
STX/ETX Control	Disable STX/ETX transmission ◆ Enable STX/ETX transmission		0 1	
Record Suffix	None CR ◆ LF CRLF	TAB SPACE User define character	0 1 2 3	4 5 6
Preamble	None ◆ 1-15 characters		FIN [00-7F], [FIN]	
Postamble	None ◆ 1-15 characters		FIN [00-7F], [FIN]	
Handshaking Protocol	None ◆ RTS/CTS ACK/ NAK Xon/Xoff		0 1 2 3	
Intermessage Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Intercharacter Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Interfunction Delay	None ◆ 1-99 (x5) msec.		FIN (2 digits)	
Serial Response Time-out	None 200 msec. 500 msec. ◆ 1 sec.	2 sec. 5 sec. User define value (sec.)	0 1 2 3	4 5 6

Message String Breakdown

USB HID interface output

Preamble	Data Length	Prefix ID	Scanned Data	Suffix ID	Postamble	Record Suffix
1-15 char.	2-3 digits	1 or 2 char.	Variable	1 or 2 char.	1-15 char.	1 char.

Serial interface output (RS-232, USB COM Port Emulation)

STX	Preamble	Data Length	Prefix ID	Scanned Data	Suffix ID	Postamble	ETX	Record Suffix
1 char.	1-15 char.	2-3 digits	1 or 2 char.	Variable	1 or 2 char.	1-15 char.	1 char.	1 char.

Operation Control

Command	Parameter Selection	Option Code
Inverse Reading	Disable ◆ Enable	0 1
Redundancy	None Level 1 ◆ Level 2 Level 3 Level 4 Level 5 Scan Voting	0 1 2 3 4 5
Power On Indicator	Disable (LED off) LED steady on ◆ LED flash	0 1 2
Buzzer Tone Control	Buzzer tone – mute Buzzer tone – low Buzzer tone – medium ◆ Buzzer tone – high Buzzer tone – extremely high Power–on beep ◆ No Power–on beep	0 1 2 3 4 5 6
Good Read Duration	Short Medium ◆ Long Extremely long Extremely short	0 1 2 3 4
Presentation Sensitivity	Level 1 Level 2 Level 3 Level 4 Level 5 ◆ Level 6 Level 7	0 1 2 3 4 5 6
Hands Free Time-out	Short ◆ Medium Long Extremely long Disable	0 1 2 3 4
Scan Input Time-out	100 msec. 200 msec. 300 msec. 400 msec. 500 msec. 600 msec. 700 msec. 800 msec. 900 msec. ◆ User define: 1-99 sec.	0 1 2 3 4 5 6 7 8 9, (2 digits)

Output Control

Command	Parameter Selection	Option Code
Dollar Sign Output	Dollar sign output as " $ " ◆ Dollar sign output as " ¥ " Dollar sign output as " € " Dollar sign output as " £ " Dollar sign output as " ¢ "	0 1 2 3 4
Good Read Delay	None ◆ 200 msec. 500 msec. 1 sec. 1.5 sec. 2 sec. 3 sec.	0 1 2 3 4 5 6
Reread Delay	Disable Immediate time out ◆ Short time out Medium time out Long time out Force verification Double Scan Verification	0 1 2 3 4 5
OK/NG Signal Active States	OK low/NG low ◆ OK low/NG high OK high/NG low OK high/NG high	0 1 2 3
OK/NG Signal Output Control	Disable OK/NG output Enable NG output Enable OK output Enable OK/NG output ◆	0 1 2 3
OK/NG Signal Duration	10 msec. 20 msec. 30 msec. 40 msec. 50 msec. 60 msec. 70 msec. 80 msec. 90 msec. 100 msec. ◆ User define: 1-99 (x50) msec.	0 1 2 3 4 5 6 7 8 9 A, (2 digits)
OK/NG Beeping Control	Disable OK and NG beep Enable OK and NG beep ◆ Enable OK beep and disable NG beep Enable NG beep and disable OK beep	0 1 2 3
Symbology ID Transmission	Disable symbology ID transmission ◆ Enable prefix CINO symbology ID transmission Enable suffix CINO symbology ID transmission Enable prefix and suffix CINO symbology ID transmission Enable prefix AIM symbology ID transmission Enable suffix AIM symbology ID transmission Enable prefix and suffix AIM symbology ID transmission	0 1 2 3 4 5 6

Option Codes

||||||||| |||
0

||||||||| |||
1

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2

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3

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4

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5

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8

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9

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A

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B

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C

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D

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E

||||||||| |||
F

||||||||| |||
FIN (Finish)

||||||||| |||
END (Exit)

FuzzyScan Fixed Mount Scanner Quick Start Guide - FM400 Series
International Edition, Rev. A

P/N: YMAUB70010000R0

CINO GROUP
PC WORTH INT'L CO., LTD.

Disclaimer

Warranty

Cino warrants its products against defects in workmanship and materials from the date of shipment, provided that the product is operated under normal and proper conditions. The warranty provisions and durations are furnished by different warranty programs. The above warranty does not apply to any product which has been (i) misused; (ii) damaged by accident or negligence; (iii) modified or altered by the purchaser or other party; (iv) repaired or tampered by unauthorized representatives; (v) operated or stored beyond the specified operational and environmental parameters; (vi) applied software, accessories or parts are not supplied by Cino; (vii) damaged by circumstances out of Cino's control, such as, but not limited to, lightning or fluctuation in electrical power. Any defective product must follow the warranty program and RMA procedures to return Cino for inspection.

Regulatory

FCC	FCC part 15B	Industry Canada ICES-003
CE	EN55022, EN55024, EN61000-3-2, EN61000-3-3	LED Eye Safety — IEC60825-1, EN60825-1
	CNS13438	

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