

NITGEN® FIM2030 & FIM2040

Stand-Alone Fingerprint Identification Device with Built-in CPU

Datasheet

Version 1.06

FIM2030 & FIM2040



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Serial Number:

Specifications can be changed without notice.

FIM2030 & FIM2040



Revision History

<i>Date of Revision</i>	<i>Version</i>	<i>Description</i>
2005-10-25	1.06	Release

1. General Descriptions

FIM20xx is a high-end stand-alone Fingerprint Identification Device with many excellent features. It provides benefits such as high identification performance, low power consumption and two RS-232 serial interfaces with the various commands for easy integration into a wide range of applications. It is a durable and compact device with fingerprint identification module containing NITGEN® optics-based fingerprint sensor inside.

2. Target Application

Access Controller with more than 1000 users
Time and attendance management
ATM, POS and more

3. Basic Feature

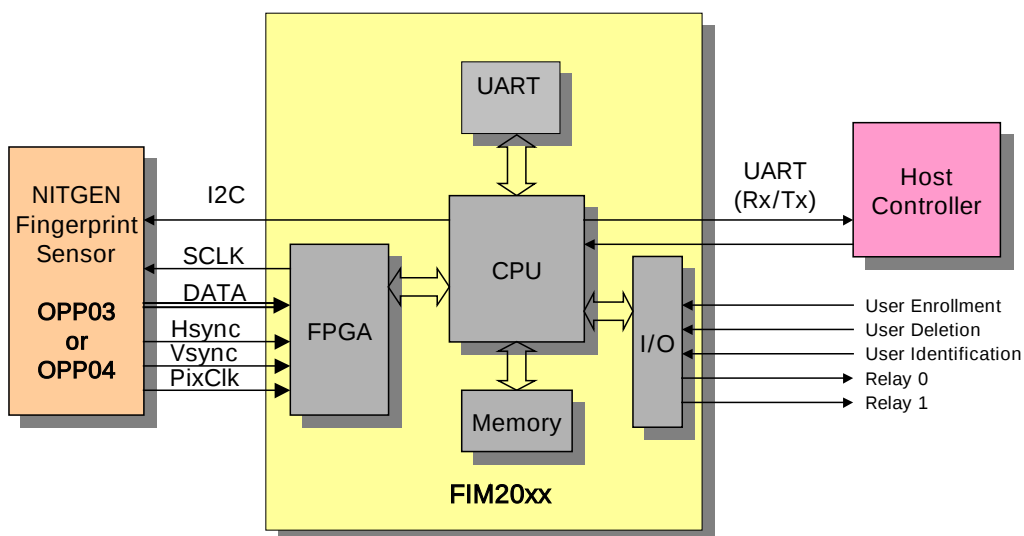
Hardware Specification

ITEM		FIM20xx
Board Spec.	CPU	S2C2410 (ARM9)
	DRAM	8Mbyte SDRAM
	Flash ROM	Program Flash: 1Mbytes DB Flash: 1/2/4 Mbytes
Dimension		43 x 93 [mm ²]
Sensor		NITGEN OPP03 (in FIM2030) NITGEN OPP04 (in FIM2040)
Supply Voltage		5 ± 0.5 [V]
Current Consumption		Max. 300 [mA]
Operating Temperature		-20 ~ 60 [°C]
Humidity		5 ~ 95 [% RH]
ESD Tolerance		±8 [KV] (indirect)
Communication Channel		2 Port RS-232 Speed: 9600 ~ 115200 [bps]
External I/O		3 Input (for Demo Only) 2 Relay Output, 2 Reserved Input

Operation Specification

ITEM	FIM20xx
Capture Speed	0.3(normal) / 1.1(secure) sec
Verification Speed	1.8 [sec] (Capture + Extract + Match)
Boot Up Time	Max. 0.7 [sec] for 100 users Max. 1.0 [sec] for 500 users Max. 2.0 [sec] for 1000 users Max. 4.0 [sec] for 2000 users Max. 12.0 [sec] for 4000 users
Data Encryption Method	AES for saving data AES for DB communication

4. Block Diagram



RS-232C communication data consist of 8-bit data, no parity, 1-bit start-bit and 1-bit stop-bit.

5. Operation

Reset

FIM20xx provides external low-active reset signal port. By setting the reset port low state, FIM20xx is initialized. The reset port is internally pull-uped to VCC.

Communication

FIM20xx has two RS-232 serial communication ports through those FIM20xx communicates at the same time. These ports support 6 baudrate modes such as 9600, 14400, 19200, 38400, 57600, and 115200 bps.

FIM20xx follows NITGEN Serial Communication protocol. For more detail information refer to the document "NITGEN_ComProocl.pdf".

User Data Area

FIM20xx provides 64 Kbytes flash memory. Using this memory, host can save private data for specific usage. The caution is needed for the responsibility for reading, writing and erasing user data area is given to the host.

Relay Output

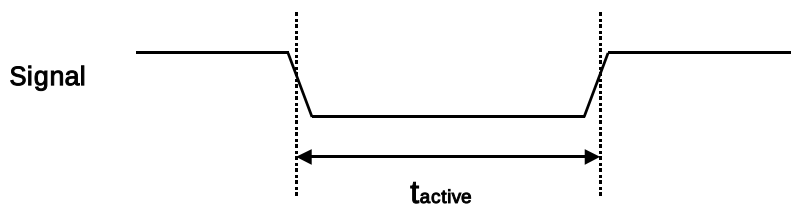
FIM20xx has two relay-signal output ports. After executing matching commands, such as Verification, Identification, Instant Matching and so on, the result is outputted in RELAY_0 port. If the result is success, high state is outputted. The duration of high state is controlled by board configuration system option. Relay-signal output ports can be set or reset regardless of the matching result for a various usage.

Key Function

FIM20xx supports 3 function key inputs such as Enroll_Key, Delete_Key, and Identify_Key. Using these keys without serial communication, enrollment, deletion, all deletion and

identification operating can be executed.

The following timing diagram and table show the operation condition of keys.



Command	Signal Name	t_{active}	
		Minimum [ms]	Maximum [ms]
CMD_ENROLL	/ENROLL_KEY	30	
CMD_DELETE	/DELETE_KEY	30	3,000
CMD_IDENTIFY	/IDENTIFY_KEY	30	
CMD_DELETE_ALL	/DELETE_KEY	3,000	

Board configuration option

The following table shows board configuration system option. Using NITGEN Serial Communication protocol, these option values can be changed.

Code	System Information	Value Range	Default Value	
0x01	SI_USING_RELAY	True/False	False	
0x02	SI_USING_LOG	True/False	True	
0x03	SI_NUM_OF_TEMP	2, 4	2	
0x10	SI_WIEGAND_FORMAT	0 – No out 1 – 26 bits 2 – 34 bits	0	
0x11	SI_WIEGAND_SITECODE		0x0000	
0x17	SI_IDENTIFY_TIMEOUT	255 or 10 ~ 250	255 (Unlimited)	100ms tick

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0x18	SI_RELAY_TIME	0 or 1~100	10	100ms ticks
0x19	SI_CAPTURE_TIMEOUT	More than 10	50	100ms ticks
0x20	SI_IMAGE_BRIGHTNESS	0~100	45	100 - brightest
0x21	SI_IMAGE_GAIN	1,2,4,8	2	
0x22	SI_IMAGE_CONTRAST	0~100	20	
0x28	SI_ADAPTIVE_CAPTURE	True/False	True	
0x30	SI_VERIFY_SECURITY_LEVEL	1~9	5	
0x31	SI_IDENTIFY_SECURITY_LEVEL	6~9	8	
0x32	SI_REGISTER_QUALITY	30~100	40	
0x33	SI_VERIFY_QUALITY	10~100	30	
0x38	SI_USING_LATENT	True/False	True	
0x40	SI_ENABLE_CHANNEL1	True/False	False	
0x48	SI_CHANNEL0_BAUDRATE	0 – 115200 1 – 57600 2 – 38400 3 – 19200 4 – 9600	4	
0x49	SI_CHANNEL1_BAUDRATE	“	4	
0x4A	SI_CURR_CHANNEL_BAUDRATE	“		
0x50	SI_MAX_USER			

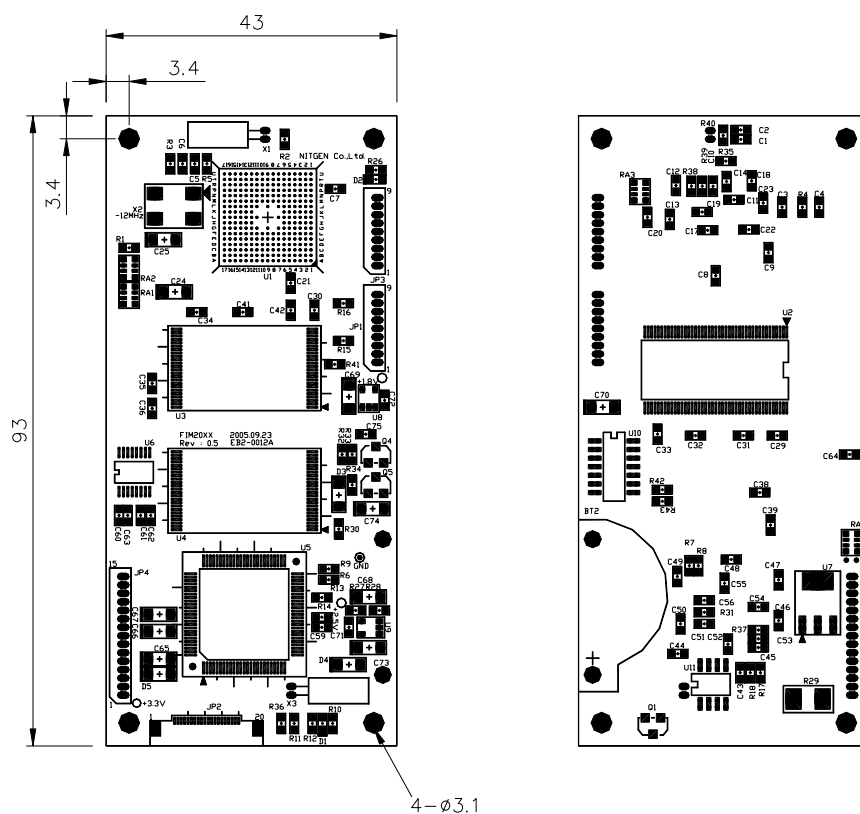
True means '1' and False means '0'.

6. Technical Data

6.1. Physical Characteristics

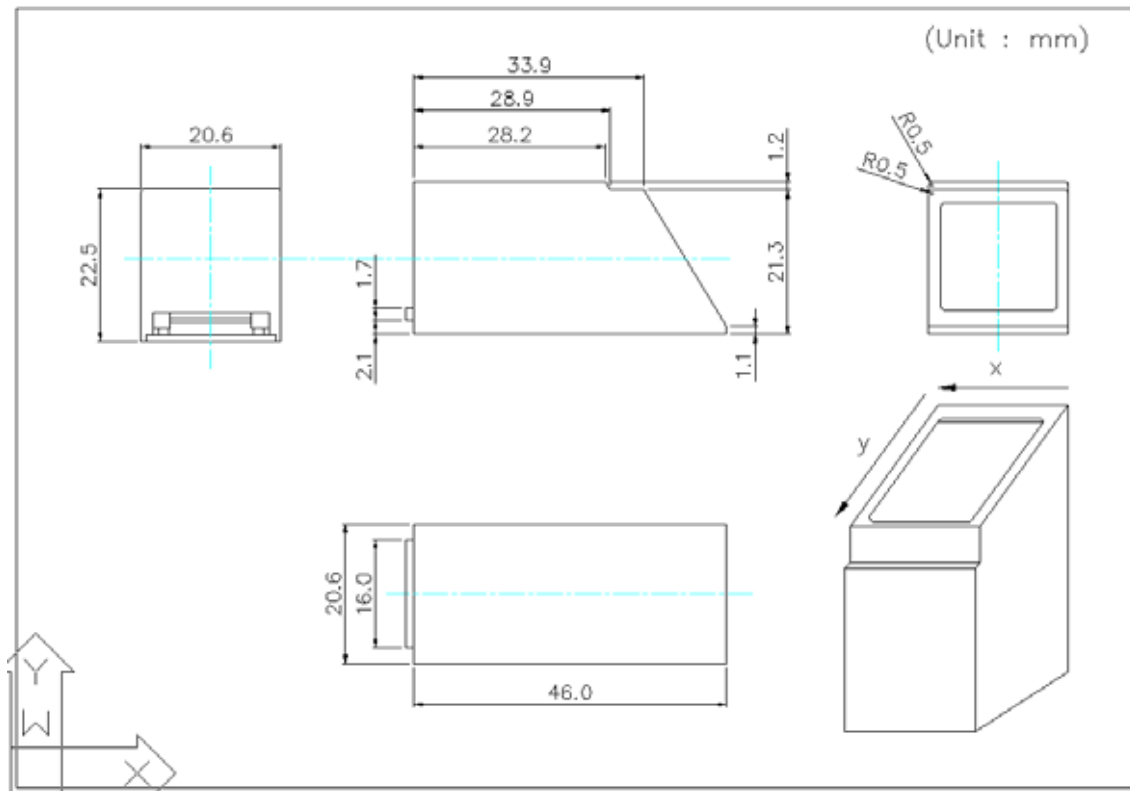
The Feature of Board

[: mm]



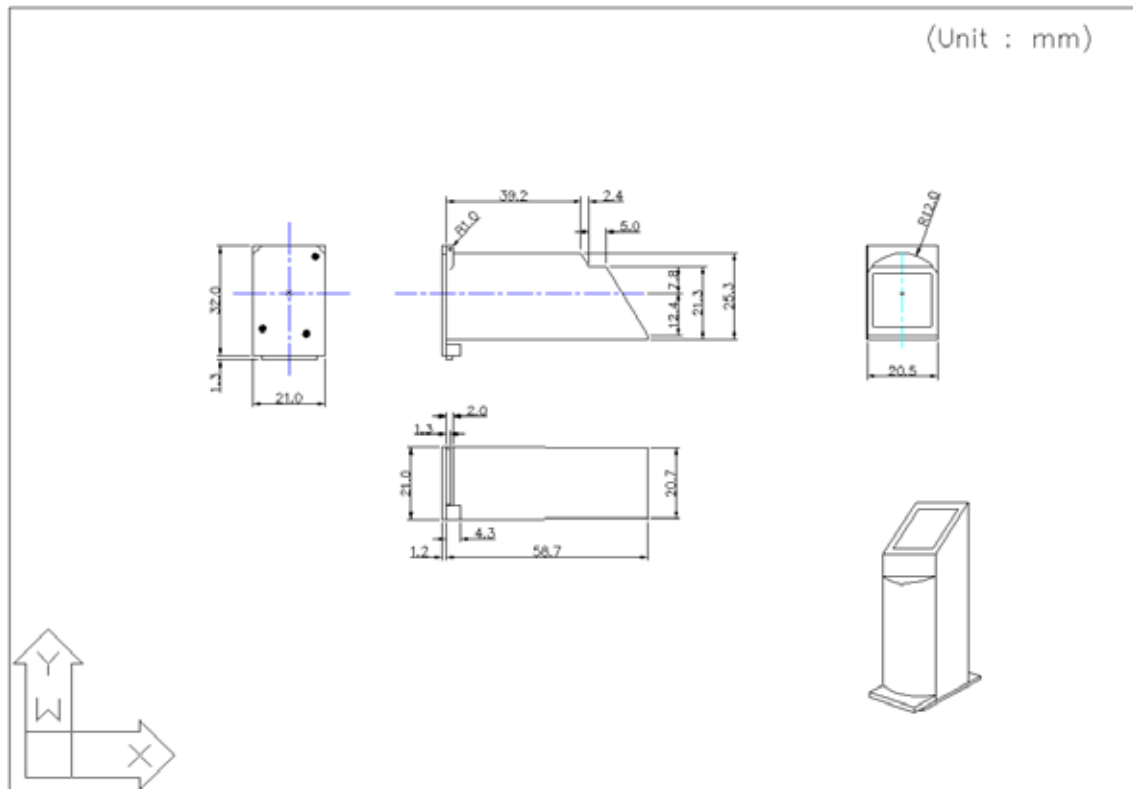
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The feature of Optical fingerprint sensor



The Dimension of OPP04

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The Dimension of OPP03

6.2. External Port

● JTAG Connector (JP1)

Pin	Pin Name	Description
1	VCC	3.3 Volt Power
2	N/A	N/A
3	nSRST	JTAG control pin
4	TDO	JTAG control pin
5	TDI	JTAG control pin
6	nTRST	JTAG control pin
7	TCK	JTAG control pin
8	TMS	JTAG control pin
9	GND	Ground

* JP1 (JTAG connector) is used only for development or emergency recovery.

● 20-Pin Sensor Connection (JP2)

Name	No	States	Description
GND	1	POWER	Sensor Ground
VCLK	2	IN	Sensor Clock
VCC	3	POWER	Sensor VCC (3.3V)
	4		Reserved
	5		Reserved
VSYNC	6	IN	Vertical Sync.
HSYNC	7	IN	Horizontal Sync.
SDATA0	8	IN	Sensor Data 0
SDATA1	9	IN	Sensor Data 1
SDATA2	10	IN	Sensor Data 2
SDATA3	11	IN	Sensor Data 3
SDATA4	12	IN	Sensor Data 4
SDATA5	13	IN	Sensor Data 5
SDATA6	14	IN	Sensor Data 6
SDATA7	15	IN	Sensor Data 7
SDA	16	IN/OUT	I2C Data
SCL	17	OUT	I2C Clock
LED	18	OUT	Sensor LED

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PIXCLK	19	IN	Pixel Clock
GND	20	POWER	Sensor Ground

- 15-Pin External Connector (JP4)

Pin	Pin Name	Description
1	VCC	5V
2	RXD0	RS-232C port receiving signal from host (Channel 0)
3	TXD0	RS-232C port transmitting signal to host (Channel 0)
4	RELAY_0	Relay enable output
5	RELAY_1	Relay enable output
6	GND	Ground
7	RXD1	RS-232C port receiving signal from host (Channel 1)
8	TXD1	RS-232C port transmitting signal to host (Channel 1)
9	/ENROLL_KEY	Key input for enrollment (Demo only) – active low
10	/DELETE_KEY	Key input for deletion (Demo only) – active low
11	/IDENTIFY_KEY	Key for identification (Demo only) – active low
12	/RESET	Reset signal – active low
13	RESERVED	
14	RESERVED	
15	RESERVED	

- I/O Port Operation Condition

Pin	Name	Direction	Initial State	Active State
4	RELAY_0	Output	Low	High
5	RELAY_1	Output	Low	High
9	/ENROLL_KEY	Input	High	Low
10	/DELETE_KEY	Input	High	Low
11	/IDENTIFY_KEY	Input	High	Low

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- Reserved Port for future use (JP3)

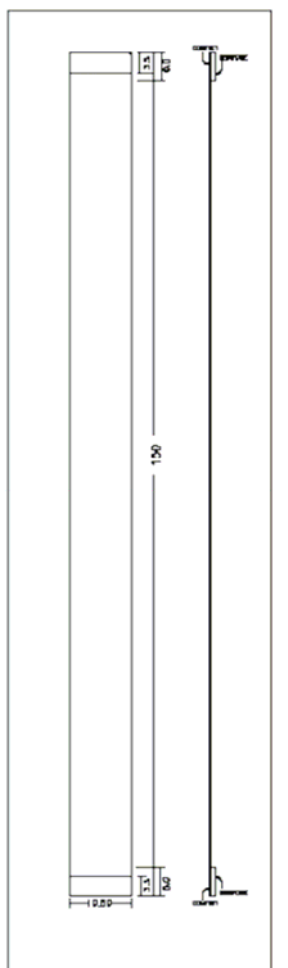
Name	No	Description
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	

* This connector is reserved for future use. The FIM20xx having no JP3 connector is delivered.

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6.3. Connector and Cable

6.3.1 Sensor



Material List

NO	DESCRIPTION	VENDOR
1	20-PIN (52746-2090)	MOLEX

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6.3.2 Communication

Material List

NO	DESCRIPTION	VENDOR
1	15-PIN Male (53047-1510)	MOLEX
2	Matching Female (51021-1500)	MOLEX

6.4. Electrical Characteristics

Parameter	MIN.	TPY.	MAX.	UINTS
Power				
Supply current			300	mA
Supply Voltage	4.5	5.0	5.5	V
RS-232				
Output Voltage Swing	±5.0	±5.4		V
Input Voltage Range	-15		+15	V
Input Threshold LOW	0.6	1.2		V
Input Threshold HIGH		1.5	2.4	V
Maximum data rate			115,200	BPS
Relay				
Output Voltage HIGH	2.4			V
Output Voltage LOW			0.4	V
Etc				
Reset pulse Width	1			ms

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7. Ordering Information

FIM2030 (with OPP03) Ordering Guide

Ordering Number	Max. Users
FIM2030 - HV	1000
FIM2030 - HV2	2000
FIM2030 - HV4	4000

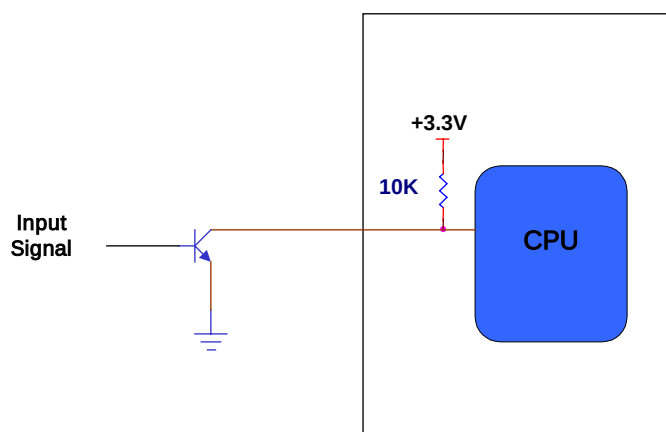
FIM2040 (with OPP04) Ordering Guide

Ordering Number	Max. Users
FIM2040 - HV	1000
FIM2040 - HV2	2000
FIM2040 - HV4	4000

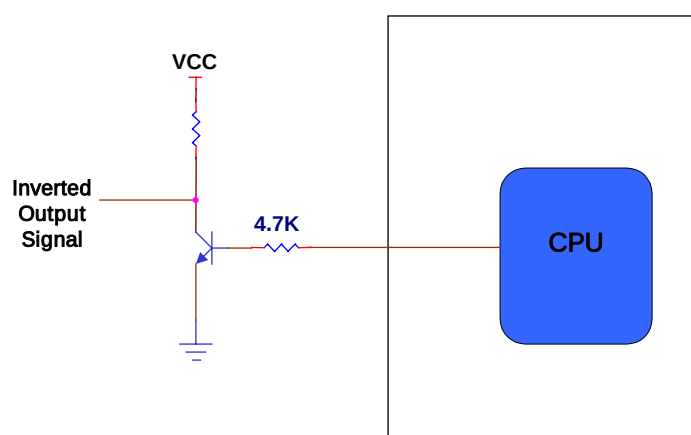
APPENDIX

Recommended circuit

Input - /ENROLL_KEY, /DELETE_KEY, and /IDENTIFY_KEY



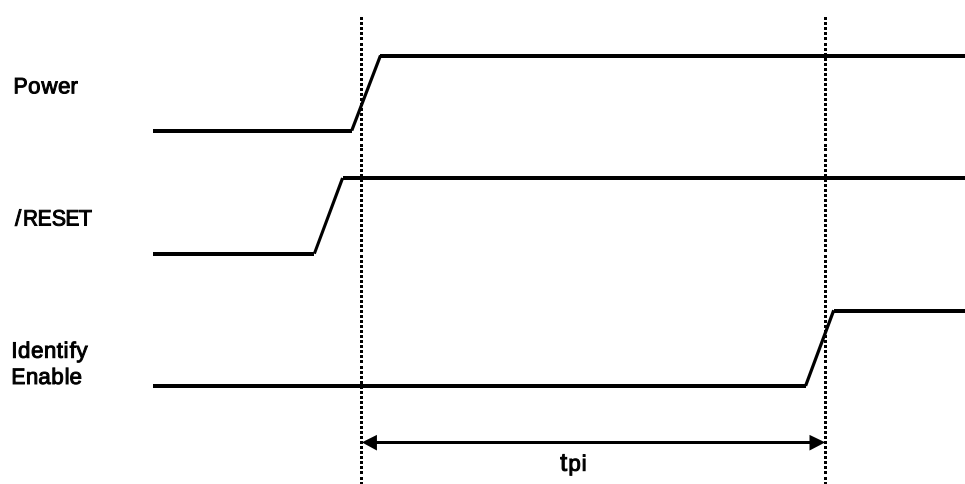
Output – RELAY_0 and RELAY_1



Boot up time

System Boot-up time means the total time consumed by FIM20xx after system power is supplied on condition that **/RESET** is high.

System Boot-up time can be measured as the following.



Support Information

NITGEN Co., Ltd.

Sam-o Bldg. 3F, 905-4, Hogae-dong, dongan-gu, Anyang,
Kyungki-do, Korea

Tel: +82-31-451-9400

Fax: +82-31-451-6722

E-mail. Customer@nitgen.com