## Siman



### **SDBM-100 Series Laser Ranging Module**

The SDBM-100 series, developed by Siman Sensing Technologies, is an ITOF (Indirect Optical Flight Time) laser ranging module featuring rapid response and high-precision measurement. With a measurement accuracy of  $\pm 3$ mm, it updates data at 20Hz and has a maximum range of 150 meters. Its compact design and UART digital interface facilitate system integration and secondary development.

This product is widely used in industrial automation, robot navigation, intelligent warehousing, security monitoring and other high-precision distance measurement scenarios. With excellent performance-to-price ratio, it is the ideal choice for various distance measurement applications. For more product information, please visit: www.siman.asia

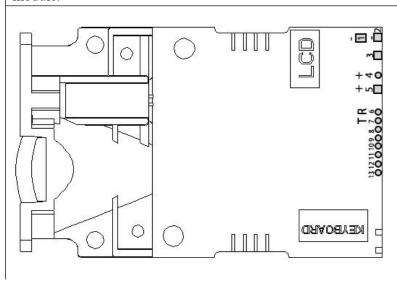
*****	Follow the equipment usage guidelines! This product is not a safety sensor and
warn	cannot be used for personnel protection.
	Measuring laser (635nm): Class 2. Do not look directly at the beam or use
	optical instruments to observe.
	> This product has no explosion-proof structure, and it is forbidden to use in
	flammable and explosive environments.
	> Do not remove this product.
**	> Be sure to turn off the power before operating. Do not connect wires while
	powered on!
	<ol> <li>Avoid use in dust/steam or corrosive gas environment;</li> </ol>
	2. Avoid use in environments where corrosive gases are produced:

## Pin definition

4 to 5 pins are required to power and control the laser distance measurement module.

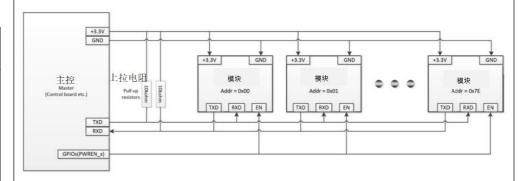
When used outdoors, pay attention to adding a waterproof cover.

Do not use this product in water.



Pin function	ons			
pin Pin	name	function	Windows	description
pin rin	Hame	Tunction	default	description
1	GND	the earth	Power	Madula navyanavyaniy
1	GND	the earth	supply	Module power supply
2	GND	the earth	Power	Madula marron grander (commented to 1)
2	GND	the earth	supply	Module power supply (connected to 1)
2	DWDEN	-:	1 T	Module power control pin, high level
3	PWREN	signal input	low Low	effective
4	VCC+	source +	source	DC 2.5V~3.3V 90mA+
5	VCC+	source +	source	DC 2.5V~3.3V 90mA+ (4-way)
6	RXD	ai am al immust	Cas High	Module serial port receive pin with
6	KAD	signal input	Gao High	open-drain
7	TXD	signal output	Gao High	Module serial port send pin, open-drain

The terminal application may require connecting multiple laser distance measurement modules to simultaneously read distance values. In a multi-slave system, ensure each module is assigned a unique address bit before network connection to prevent conflicts. Each module's default address bit is 0x00 before factory release.



The TXD/RXD pins of the TTL-USB module lack external pull-up resistors, as the USB converter's TXD/RXD pins are equipped with built-in pull-up resistors.

The white line PWREN may be omitted.

If you're using PWREN, be sure to select DTS. RTS can control the module's power supply.

Note: The TXD/RXD module pins are open-drain type.

If the signal is connected to the microcontroller, add a pull-up resistor.

(There are also modules without a pull resistor)





Maximum rated p	arameter			
Note: Exceeding or	ne or more limit value	es may cause perman	ent damage to the mo	odule!
category	least value Min	Normal	crest value Max	unit Units
voltage VCC	-0.3	3.0	5.5	V
GND		0	0	V
TXD	-0.3		VCC+0.3	V
RXD	-0.3		VCC+0.3	V
PWREN	-0.3	VCC	4.0	V
working	-40		+60	℃
temperature				

°C

+60

Storage

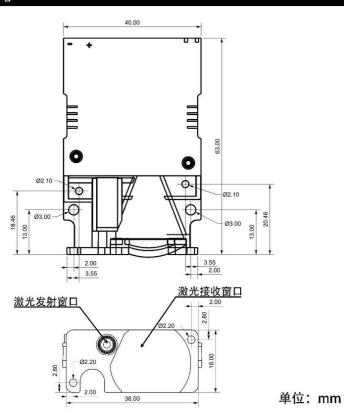
temperature

-40

Specifications										
1-1	SDBM-100	SDBM-100	SDBM-100	SDBM-100	SDBM-150					
model	TF3	TF20	TB3	TB20	TF3					
measuring range		0.03100	m indoor 90% r	eflectivity						
repeatability			±2mm							
precision	±211III									
accuracy	±3mm									
measuring	3hz	3hz 20hz 3hz 20hz 3hz								
frequency	3hz 20hz 3hz 20hz 3hz									
laser light source			635nm, Class 2							
Measure the target	Natural	surface or dedica	ated reflector for	static or dynami	c targets					
object	Naturar	surface of dedica	ated reflector for	static of dynami	c targets					
Typical spot size		10m:	5x3mm, 25m:10x	к6тт						
( oval )		50m:15	x10mm, 100m:30	0x20mm						
data interface			UART							
working voltage			DC+3.3V							
power dissipation			< 0.27W							
specification and			63×40×18mm							
dimension			03/40/10/11/11							
weight			13g							
working	-20~60°€									
temperature	-20 400 C									
Storage	-40~80°C									
temperature			-10 ·00 C							
Laser life	Over 10,000h									

install With mounting holes

dimensional drawing



#### contact us

# Siman

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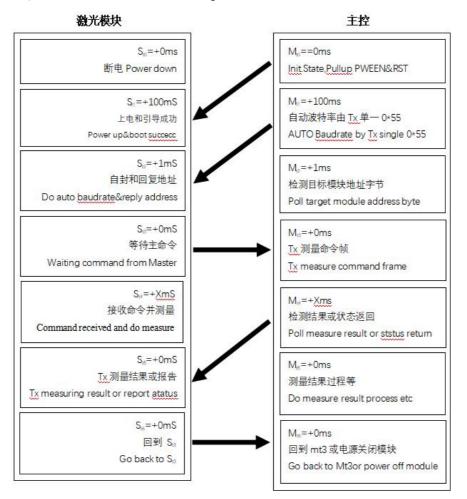
Scan the QR code to follow us

UART Communication										
Baud rate	aud rate 19200bps (SDBM-100TF3/SDBM-100TB3/SDBM-150TF3)									
	115200bps (SDE	BM-100TF20/SDB	M-100TB20)							
Start	Data bit 8	Stop position 1	Check bit: None	Flow control:						
position: 1	None									

#### Control flow characters

All communication commands are sent by the motherboard, with the laser ranging module providing auxiliary support to respond to the host's requests.

The Q&A flow for UART is shown in the figure below



Comm	and Form	at Fram								
byte	0		1	2	3	4	5	6	7	8
Bits	[7:0]	[7]	[6:0]	[7:0]	[7:0]	[7:0]	[7:0]	[7:0]	[7:0]	[7:0]
nomo	First	R/W	addres	*~~;	ster	Effe	ctive	offoot	ive byte	verifica
name	First	IV W	s	legi	SICI	Calcu	lation	eneci	iive byte	tion
give										
an	0xAA	0	0x51	0x00	0x20	0x00	0x01	0x00	0x00	0x72
exam	UXAA	0	0231	UXUU	0.00	UXUU	UXUI	UXUU	0.000	UX/Z
ple										

The table above shows an example of a single measurement request command from the host to the slave. In this command framework:

The first byte starts with the fixed header byte 0xAA; an error occurs when it starts with 0xEE. R/W stands for read/write, where 0 indicates write and 1 indicates read.

0x51 is the address bit, ranging from 0x00 to 0x7F (supporting up to 127 address bits). 0x00 is the default address, while 0x7F is the broadcast address. In a master-slave network, this broadcast address enables simultaneous operation.

The 2nd and 3rd bytes are registers;

softw radio

data

0xAA

0x80

0x00

0x0C

0x8C

The last byte serves as the frame checksum, calculated as the sum of bytes 1 through 7 (excluding

register												
register			,	nomina	nto		func	tion				
0x0000			_		ERR C	ODE			tus cod	Δ		
0x0000			_		BAT V			cing vo				
0x0000			_		ADDR			ule ad				
0.0010			1	CEO_A	ADDK	LOO	+		asuren	nent		
0x0012	•		F	REG_C	OFFSE	Т		result offset				
0x0020	1		F	REG_N	MEA_S	START	Start	Start measuring				
0x0022			F	REG_N	MEA_I	RESULT	meas	sureme	nt resu	lt		
0x01BI	0x01BE				CTRL_	LD	Lase	r diode	e contre	ol		
data												
b	yte	(	)		1	2		3		4		
na	J				dress	r	egister		verif	ication		
d					x80	0x00	0	x00	0	x80		
Type: R	ead comr	nand										
Register	address:	0x0000	)									
Function	n: Read tl	ne statu	s of th	ne mod	lule aft	er the pre	vious c	ommar	nd is ex	ecuted		
byte	0	1	2	3	3	4 :	5	6	7	8		
nam	P: .	addr				Effective		effecti	ive	verif		
e	First	ess	re	egister		Calculatio				ation		
1 ,	0xA	0.00	0.00		00 0	00 0		0xY				
data	A	0X80	0x80 0x00 0x				01	Y	Z	sum		
The sum	is the pa	arity bit	, calcı	ulated	as the	hexadecir	nal sum	of all	preced	ing by		
except the	he first by	yte (AA	.).									
Byte 0x2	ZZ is the	status c	ode r	eturne	d by th	e machine	e					
Normal	reply: A	A 80 00	00 00	01 00	00 81							
1	yte	(	)		1	2		3		4		
b										verification		
	ame	Fi	rst	ad	dress	r	egister		verif			
na d	ame ata		rst AA			0x00		x0A				
na		0xA			dress			x0A		ication		
na d	ata	0x/	AA		dress			x0A		ication		
na d Type: Register	ata ead comr	0x2 mand 0x0002	AA A	0	dress		0	x0A		ication		
na d Type: Register	ata ead comr	0x2 mand 0x0002	AA A	0	dress	0x00	0	x0A		ication		
Type: Register	ata ead comr address:	0xAmand 0x000Ame hards	AA A ware v	version	dress x80	er of the 1	module 5	6	7	ication x8A		
Type: Register	ata ead comr address:	0xAmand 0x000A	AA A ware v	version	dress x80	0x00	module 5	6 effe	0. 7	8 veri		
Type: Register Function byte	ead comr address: n: Read the	0x2 mand 0x0002 he hard	AA A ware v	version 2	dress x80	er of the 1	module 5	6 effe	7	8 veri		
Type: Register Function byte	ead comr address: n: Read the	0x20002 mand 0x0002 he hards 1 adding ss	AA Ware v	version 2	dress x80	er of the 1	module 5	6 effective by	7 ctive yte 0x	8 verification		
Type: Register Function byte name	ead comments address: n: Read the state of t	oxamand oxoooa he hards addi ss ox8	AA ware v  o  o  o  o  o  o  o  o  o  o  o  o  o	version 2 regis	dress x80  n numb 3  ster  0x0 A	er of the 1  4  Effec Calcul	module 5 tive ation	6 effe	7 ctive	8 verification		
Type: Register Function byte name	ead comre address:  Read tl  0  First	oxamand oxoooa he hards addi ss ox8	AA ware v  o  o  o  o  o  o  o  o  o  o  o  o  o	version 2 regis	dress x80  n numb 3  ster  0x0 A	er of the 1  4  Effec Calcul	module 5 tive ation	6 effe by 0x VV	7 ctive yte 0x	8 verification		
Type: Register Function byte name data	ead comments address: n: Read the state of t	oxamand oxoooa he hards addi ss ox8	AA ware v  re  0 0 ris 0x	version 2 regis	dress x80  n numb 3  ster  0x0 A	er of the 1  4  Effec Calcul	module 5 tive ation	6 effective by	7 ctive yte 0x YY	8 verification		
S	ox0020 ox0020 ox0021 ox01BI  cti data  by na dby Type: Re From ad Register Function byte nam e data  The sum except tl Byte 0x2	byte name data  Type: Read common From address: 0x Register address: Function: Read the part of the sum is the part of the first by Byte 0xZZ is the	0x0020 0x0022 0x01BE  titi data  byte 0 name Fin data 0xA  Type: Read command From address: 0x000 Register address: 0x0000 Function: Read the statu  byte 0 1 nam First ess data 0xA A 0x80  The sum is the parity bit except the first byte (AA Byte 0xZZ is the status of	0x0020  0x0022  1  0x01BE  1  1  1  1  1  1  1  1  1  1  1  1  1	0x0020 REG_N 0x0022 REG_N 0x01BE REG_O  cti data  byte 0 name First ad data 0xAA 0  Type: Read command From address: 0x000 Register address: 0x0000 Function: Read the status of the mod byte 0 1 2 3  nam First ess register e OxA 0x80 0x00 0x  The sum is the parity bit, calculated except the first byte (AA). Byte 0xZZ is the status code returne	0x0020  0x0022  REG_MEA_S  0x01BE  REG_CTRL_  til data  byte 0 1  name First address  data 0xAA 0x80  Type: Read command  From address: 0x00  Register address: 0x000  Function: Read the status of the module aft  byte 0 1 2 3  nam First ess  data 0xA 0x80 0x00 0x00 0  The sum is the parity bit, calculated as the sexcept the first byte (AA).	0x0020 REG_MEA_START  0x0022 REG_MEA_RESULT  0x01BE REG_CTRL_LD  cti data  byte 0 1 2  name First address r  data 0xAA 0x80 0x00  Type: Read command  From address: 0x000  Register address: 0x0000  Function: Read the status of the module after the pre-  byte 0 1 2 3 4 5  nam First ess register  c Calculation  iv data 0xA 0x80 0x00 0x00 0x00 0x  The sum is the parity bit, calculated as the hexadecine except the first byte (AA).  Byte 0xZZ is the status code returned by the machine	Dx0020   REG_MEA_START   Start	REG_MEA_START   Start measurement	result offset		

are versi on		Type: Read of From addres Register add	s: 0x00	00C								na me	Fir st	add res	reg	ister	Effect Calcula		Effecti distand	ce signal quality	verifi cation				0xA	S	0x0	0x1
num		Function: Re										dat	0x	0x0	0x	0x2	0x0	0x0	0xAAB	BC				data	A	0x00	0	2
ber	receiv	name	First	addres	2 regist	3 ter	4   5 Effective	6 7 effective	veri fica			a byte	A A 0	0	00	2	3	3 4	CDD 5	0x0101 6 7	sum 8			name	0 First	addre		gister
	e	data	0xAA	0x80	0x00	0x0 C	n 0x0   0x0 0   1					nam e	First	t add		regi	ster	Effect Calcul		effective byte	verifi catio	Turn	trans mit by	data	0xAA	0x00	0x01	02
		The SW vers	ion numb	er is 0x	VVYY						trans	data	0xA	0x	.00	0x00	0x10	0x00	0x0	0x00 0xY	sum	laser on or	radio	Type: Wi	ite comma	ınd		
	trans mit by	name data		0 First 0xAA	address 0x80	3	register x00 (		fication x8E		mit by radio	Type: C		and wr	rite; n	nodifies		dule ID		modifying the		off		Register	dress: 0x00 address: 0x Turn the	k01BE	am on o	r off. l
Read mod	radio	Type: Read of Register add Function: Re	ress: 0x00	00E						Set		From ac Register	r addre	ess: 0x		ed addı	ress						receiv e	0x00, the	laser is of	f.		
ule		byte	0	1	2	3 4	1 5	6 7	8	mod			n: Set	modul	e addr			will no		t after power fa				byte	0	1	2	
serial num ber	receiv e	name	First	addre ss	registe		Effective alculatio	effective byte	ver ific atio	ule addre ss		name		st	ddre ss	2 reg	gister	Calcu	ctive	6 7 effective byte	verific ation			name	First	add	r	register
		data	0xA A	0x80		x0 02 E (		0xS 0xN S N	n su m		receiv	data Set the	0xA	. 0	)x00	0x00	Only bit	0x0 0 s [6:0] s	0x0 1	$\begin{array}{c cc} 0x0 & 0x \\ \hline 0 & YY \\ \end{array}$ i; other bits are	sum ignored)	-	trans mit by	data	0xAA		00 0	0 (
	trans mit by radio	byte name data Type: Read of	(	0 First 0xAA	1 address 0x80	0	2 register		4 fication x86		е	reserved	d for a es mea	a maste asure d host a	er-slav listanc	e netwo	ork. Whe	n a broay	adcast a	ess 0x7F. This ddress comman spond with mea d only then re	nd is sent,	Singl e	radio	From add	lress: 0x00 address: 0: Start the	x0020		) perf
Read		Register add Function: Re	ress: 0x00	006			ncoding)															auto matic		byt e	0 1	2	3	4
volta ge	receiv	byte ( nam Fi e	) 1 rst add		2 3 register		5 ffective	6 7 effective	8 veri			name		irst	1 addre	2	register	4 Ef	5 ffective	6 7 effective	ver ific	meas urem ent			Fir add st ress	regi	ster	Effec Calcu
	e	data 0x		30 0x	00 0x06	5 0x00	0 0x01	0x3 0x1 2 9	tion	Set		data		AAA	0x00		0x1		0 0x0	0 0xZ 0x <sup>3</sup>	atio n su		receiv	dat a	0x A 0x0 A 0	0x 00	0x2 2	0x0 0
Read meas urem	trans mit by radio	byte name data Type: Read enabling mu	command	0 First 0xAA 1. This c	1 address 0x80 ommand is	0			4 Effication xA2	mod ule meas urem ent offse t	trans mit by radio	Type: W From ac Registe 0xYY in Functio	Vrite co ddress: r addre ndicate n: Set	ommar: 0x00 ess: 0x0 es the comeasur	nd 0012 offset t	to adjus	2	7B (+12		Z Y				From add Register: Function 0xAABB Signal qu	ply from s lress: 0x00 address: 0: Send the CCDD mi ality = 0x d the higher	x0022 measure illimeter 101. Th	ement re rs (Bytee e smalle	5: 9), r the s
ent result		From addres Register add Function: Re	ress: 0x00		ieasuremen	t result						will be	increas	sed by	123 m	nm. If the	he offset d by 123	0xZZY 3 mm.	Y =0xFl To rest	F85 (-123), the core the origin	measured	Singl	trans	byte	0 Firs	1 addr	2 regist	3
S	receiv e	byt e 0	1	2 3	3 4	5	6:9	10:11	12		receiv e	byte name	(	0	1 addres	2	3 egister	4	ffective 5		8 veri	slow meas urem	mit by radio	data	0xA A	0x0 0	0x00	0x20

					S				Calcul	ation		byte		fica
			0 4			00	01				0	0-	-37	tion
		data	0xA A		00x0	0x0 0	0x1		0x00	0x01	$\begin{vmatrix} 0x \\ ZZ \end{vmatrix}$		κΥ Υ	su m
		byte	0		1	2	<del>                                     </del>	3	4	5	6	+	7	8
		byte			1						0		,	veri
		name	First		addre	re	gister		Effe	ctive	ef	fectiv	e	fica
					SS		5.000		Calcu	lation		byte		tion
	trans							хB	0x0	0x0	0x0	0:	xΖ	su
Turn	mit by	data	0xAA	A (	0x00	0x01		Е	0	1	0		Z	m
laser	radio	Type: W	rite com	mand	i									
on or		From ad	dress: 0x	٥00										
off		Register	address	: 0x0	1BE									
		Function	: Turn tl	ne las	er bea	m on oi	off. l	f 0x2	ZZ = 0	x01, th	e laser	is on	; if (	XZZ =
		0x00, the	laser is	off.										
	receiv e	Send the	same											
		byte	(	0	1	2		3	4	5	6	1	7	8
					addre				Effe	ctive	off	ectiv	<u> </u>	veri
		name	Fi	rst	SS		egiste	r	Calc	ulatio		oyte		fica
					33				1	n				tion
	trans	data	0x.	$_{\rm AA}$	0x00	0x(	0   0	)x2	0x0	0x0	0x0	02	x0	0x2
	mit by					0		0	0	1	0		)	1
	radio	Type: W					nstruc	tion,	laser	illumir	nates o	nce,	and	returns
		one dista			ment v	alue.								
		From ad			020									
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e		mode	. Start	iic si	ave u	evice ic	peri	OIIII	a sing	ic ilica	Surcin	JII II.	ı auı	omane
auto		byt												
matic		e	0	1	_									
meas		_		1	2	3	4	5		6:9	10:	11		12
urem					2	3			Eff	6:9				
		na		dd		ter	Effec	ctive	Eff		sign	nal		12
ent		na me	Fir a	+	regis	ter		ctive	Eff dis	fective		nal lit	veri	
ent		me	Fir ac	dd ess	regis	ter	Effect Calcu	etive lation	Eff dis	fective stance value	sign qua	nal lit	veri	on
ent		me dat	Fir ac st re	dd ess	regis:	0x2 (	Effect Calcu	otive lation	Eff dis	fective stance value	sign qua y	nal lit	veri	on afficati
ent	receiv	me	Fir ac st re	dd ess	regis	ter	Effect Calcu	etive lation	Eff dis	fective stance value	sign qua	nal lit	veri	on
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ent		dat a	Fir ac rest ox A A Ox A Ox A A A A	dd ess x0 0 m sub-	regis  0x 00	0x2 (2	Effect Calcu	otive lation	Eff dis	fective stance value	sign qua y	nal lit	veri	on afficati
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ent		me dat a Type: Re From add Register Function 0xAABE	Fir ac ox Ox A A Pply from dress: 0x address: : Send the second of the second of the second or the s	ddd dd x00	regis  0x 00  ordina  022 easurer	ter 0x2 0x2 tte	Effect Calcuu	0x0 3	Effidis v  O 0x  BC  o the hoch need	fective stance value AAAB CCDD	sign qua y 0x0 1	urem	veri	ificati on  ificati on  result =
ent		me dat a Type: Reference From add Register Function 0xAABE Signal quantum data a signal	Fir at rest ox A A Or A A Pply from address: 0x address: Send the address are send to a send the address are send to a send to	x0 0 0 m sub- x00 c 0 x00 milli 0x10	regis  0x 00  ordina  022  easurer meters 1. The	ter (0x2 ) te ment research smaller	Effective Effect	0x0 3	Effidish volume of the head of	fective stance value  AAB  CCDD  ost. The sto be y value.	sign qua y 0x0 1	urem	veri	ificati on  ificati on  result =
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urem		Type: Wr									
ent		From add									
		Register a									
		Function:	Start th	ne slave	device to	perform	n contii	nuous n	neasure	ement in	n rapid
		mode									
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		If an erro		_		rement j	phase, the	he laser	rangir	ng modu	ıle will
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ine		name	First	s	regis	ster	Calcu	lation	b <sub>i</sub>	yte	fica
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	1	Type: Rep	ply from	subordina	ite						
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		Register a	address: (	0x0000							
		Function:	Reports	the error	status co	de to the	host. E	rror cod	e = 0x0	000F. F	or more
		error code	es, refer t	to the stat	us codes.						
Exit											
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#### measurement pattern

There are two kinds of measurement mode, one is single measurement, the other is continuous measurement;

Single measurement: the host sends a measurement command, the module works once, the laser lights up once, and a measurement distance value is returned.

Continuous measurement: The host sends a measurement command, and the module operates continuously with the laser on, returning the measured distance value continuously. To stop continuous measurement, the host must send a 1-byte value 0x58 (ASCII uppercase 'X'). Each measurement mode has three working modes:

- 1. Automatic measurement: automatically adjust the measurement speed and distance accuracy according to the return distance value and signal quality;
- 2. Slow measurement: the slowest measurement speed, but the highest accuracy of the measured distance value:
- 3. Fast measurement: The distance value measured is relatively low in accuracy, but the measurement speed is the fastest.

pattern	voluntarily	low speed	fast
single measurement	Auto single	Slow single	Single quick
continuous measurement	transfer	Slow continuous	Fast Continuous
Measure speed	voluntarily	slow	fast
certainty of measurement	voluntarily	Gao	low
20.0			

*			
certainty of	voluntarily	Gao	low
measurement	Verunium	00	
condition code			
Status code (3HZ)	Status code (20HZ)		description
0x0000	0x0000		inerrancy
0x0001	0xFFFF		The input voltage is too low. The
			power supply voltage should be ≥ 2.2V
0x0002			Internal error, no problem
0x0003	0xFFFD		The module temperature is too low
			(<-20°C). This error does not occur
			in the high/low-temperature resistant
			version.
0x0004	0xFFFC		The module temperature is too high
			(> +40°C). This error does not occur
			in the high/low-temperature version.
0x0005	0xFFFB		Target is beyond range
0x0006	0xFFFA		Invalid measurement result
0x0007	0xFFF9		The background light is too bright
0x0008	0xFFF8		The laser signal is too weak
0x0009	0xFFF7		The laser signal is too strong
0x000A	0xFFF6		Hardware fault 1
0x000B	0xFFF5		Hardware fault 2
0x000C	0xFFF4		Hardware fault 3
0x000D	0xFFF3		Hardware fault 4
0x000E	0xFFF2		Hardware fault 5

0x000F	0xFFF1	The laser signal is unstable
0x0010		Hardware fault 6
0x0011		Hardware fault 7
0x0081	0xFFC3	Invalid/communication error

#### matters need attention

SDBM is an optical instrument whose operation is affected by environmental conditions. As a result, the achievable range varies during application, while the ranging accuracy remains unaffected by such factors. The following conditions may influence the range:

#### Factors affecting the range:

	8 8	
essen tial facto	Factors affecting extended measurement range	Shorten measurement factors
1		
Targe		
t		
	Special reflector, reflective film plate	A matte surface, green or blue
surfa		
ce		
Air		
parti	Clean air	Dust, fog, rain, snowstorm
cles		_
Sunli		
Sunii		
ght		
inten	Dark environment	The target is well lit
sity		

#### Reasons affecting measurement accuracy

#### (1) Rough surface

When measuring rough surfaces (such as plaster walls), align with the center of the shiny area. Use a target board to avoid measuring deep into the plaster joints.

#### (2) Transparent surface

To avoid measurement errors, do not measure against the surface of transparent objects such as colorless liquids (e.g., water) or glass (dust-free). For unfamiliar materials or liquids, perform a trial measurement first. When aiming through a glass window or when there are multiple objects in the line of sight, the measurement will be incorrect.

#### (3) Wet, smooth or high gloss surfaces

When the aiming angle is small, the laser is reflected. In this case, the SDBM receives a weak signal, or it may detect the distance to the target hit by the reflected laser. If the aiming angle is at a right angle, the SDBM may receive a strong signal.

(4) Inclined surface, circular surface When the target area is large enough to accommodate the laser spot, the measurement can be carried out.

#### (5) Multiple path reflections

Incorrect measurements may occur when the laser returning from other objects exceeds the target reflected light. Avoid various reflectors in the measurement path.

#### Security precautions

The following guidelines help SDBM managers and users anticipate potential operational risks and take preventive measures. Equipment managers must ensure all users read and follow these instructions.

If SDBM is part of a system, the system vendor must be responsible for all security-related issues, such as manuals, labels, and guidance.

instrumenttation

Allowed uses:

SDBM is allowed for distance measurement

Disabled scope:

Use of the instrument outside the stated range without following the instructions, which damages the safety system;

Remove instructions and hazard signs;

Use tools (such as screwdrivers) to modify or upgrade the device;

Do not aim directly at the sun using accessories from manufacturers not approved by Siman.

Intentionally introduce other shiny objects;

At measurement sites without safety facilities (such as road measurements)

Warning: The prohibited use method If the use may cause personal injury, instrument failure and loss, the instrument responsible has the responsibility to inform the user of the danger and how to prevent it.

Do not proceed until you understand how to use SDBM.

Use under conditions suitable for human survival.

Do not use in flammable and explosive environments.

## scope cover

Responsibility of the original equipment manufacturer Siman:

Siman is responsible for providing products under fully safe conditions, including this manual, software, and original accessories.

Non-Siman attachment manufacturer's liability:

Non-Siman accessory manufacturers are responsible for the development, availability, and safety specifications of their products. They are also responsible for the safety of Siman products online.

Major hazard:

Warning: Do not point the SDBM laser directly at the sun, as it may damage the instrument.

Do not point the SDBM laser directly at the human eye for an extended period.