Siman



SDBM-60 Series Laser Ranging Module

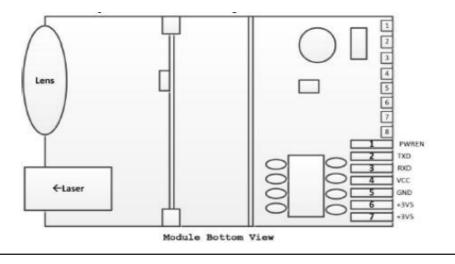
The SDBM-60 series, developed by Siman Sensing Technologies, is an ITOF (Indirect Optical Flight Time) laser ranging module featuring rapid response and high-precision measurement. With a measurement accuracy of ±3mm, it updates data at 20Hz and has a maximum range of 60 meters. Its compact design and 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

warn	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!
	1. Avoid use in dust/steam or corrosive gas environment;
	2. Avoid use in environments where corrosive gases are produced;
	> Do not use this product in water.
	➤ When used outdoors, pay attention to adding a waterproof cover.

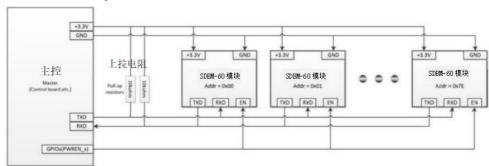
Pin definition

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



pin Pin	name	function	Windows default	description
1	PWREN	signal	low Low	Module power control pin, high level
		input		effective
2	TXD	signal	Gao High	Module serial port send pin, open
	IAD	output	Gao High	drain
3	RXD	signal	Gao High	Module serial port receive pin,
3	KAD	input	Сао підп	open-drain
4	VCC	source +	source	DC 2.5V~3.3V 300mA+
5	GND source -		the earth	Module power supply

Terminal applications 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 TTL-USB module's TXD/RXD pins lack pull-up resistors as the USB converter's TXD/RXD pins inherently contain internal pull-up resistors; the green PWREN line may be omitted.

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

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

(There are also modules without a pull resistor)



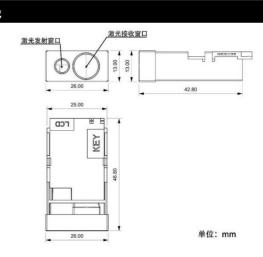
Maximum rated parameters													
Note: Exceeding one or more limit values may cause permanent damage to the module!													
category	least value Min	Normal	crest value Max	unit Units									
voltage VCC	-0.3	3.0	5.5	V									
GND		0	0	V									

TXD	-0.3		VCC+0.3	V
RXD	-0.3		VCC+0.3	V
PWREN	-0.3	VCC	4.0	V
working	-40		+60	°C
temperature				
Storage	-40		+60	℃
temperature				

temperature		
Specifications		
model	SDBM-60TF3	SDBM-60TF20
measuring range	0.0360m indoo	r 90% reflectivity
repeatability	+2,	mm
precision	±21	
accuracy	±31	mm
measuring	3hz	20hz
frequency	SHZ	ZONZ
laser light source	635nm,	Class 2
Measure the target	N. 1 C. 1 F. 1 G	
object	Natural surface of dedicated fello	ector for static or dynamic targets
Typical spot size	10m:5x3mm,	25m:10x6mm
(oval)	50m:15x10mm,	100m:30x20mm
data interface	UA	ART
working voltage	DC+	3.3V
power dissipation	< 0.	27W
specification and	49.2 × 24	5×13mm
dimension	48.3×20	13111111
weight	9	g
working	20	60℃
temperature	-20~	80 C
Storage	40	70°C
temperature	-40~	/0 C
Laser life	Over 1	0,000h
1. The standard dis	stance difference remains within ± 3mi	m across the full measurement range,

- 1. The standard distance difference remains within ± 3mm across the full measurement range unaffected by factors such as target surface flatness and color.
- 2. White targets deliver optimal results, with indoor measurements exceeding 60m
- 3. Outdoor measurement is best with a dedicated reflector
- 4. Measurement frequency: 3Hz, up to 3 times per second, capturing 3 distance data packets; 20Hz, up to 20 times per second, capturing 20 distance data packets

dimensional drawing



contact us

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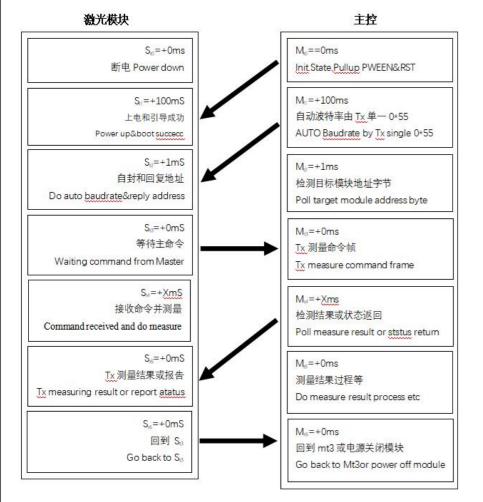
UART Communication													
Baud rate	19200bps (SDBM-60TF3) /115200bps (SDBM-60TF20)												
Start position: 1	Data bit 8	Stop position 1	Check bit:	Flow control:									
			None	None									

Control flow characters

Command Format Framework

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



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]
name	First	R/W	addre ss	regi	ster		ctive lation	effectiv	verifica tion	
give an example	0xAA	0	0x51	0x00	0x20	0x00	0x01	0x00	0x0 0	0x72

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;

The last byte serves as the frame checksum, calculated as the sum of bytes 1 through 7 (excluding the first byte), with byte overflow being ignored.

control register													
order number	regi	ster		no	minate				function				
1	0x0	000		R	EG_ER	R_COI		System status code					
2	0x0	006		R	REG_BAT_VLTG					working voltage			
3	0x0	010		R	EG_AD	DRES	S		Modul	le address			
									Modul	le			
4	0x0	012		R	EG_OF	FSET			measu	rement result			
									offset				
5	0x0	020		R	EG_ME	EA_STA	ART		Start n	neasuring			
6	0x0	022		R	EG_ME	EA_RE	SULT		measu	rement result			
7	0x0	R	EG_CT	RL_LI)		Laser	diode control					
order													
function direct	data	lata											
ion	data									,			
	ŀ	byte 0				1 2				4			
	n	ame	Fir	st	address register				verification				
trans	Ċ	lata	0xA	AA	0x80 0x00 0				0x00 0x80				
mit	Type: F	Read con	nmand										
by	From a	ddress: (00x00										
radio	Registe	r addres	s: 0x000	0									
	Functio	n: Read	d the st	atus o	f the r	nodule	after	the pre	vious	command is			
Read the	execute	d											
latest	byte	0	1	2	3	4	5	6	7	8			
module	nam		addre			Effe	ctive	effe	ctive	verificati			
status	e	First	SS	reg	ister	Calcı	ulatio		te	on			
						1	1	- 0,					
recei	data	0xA	0x80	0x0	0x0	0x0	0x0	0xY	0xZ	sum			
ve		A		0	0	0	1	Y	Z				
	The Su	ım bit i	is a pari	ty che	ck, cal	culated	l as the	e hexac	lecima	l sum of all			
I	1	The Sum bit is a parity check, calculated as the hexadecimal sum of all preceding bytes (excluding the first byte AA). Byte 0xZZ is the status code returned by the machine											
	1 -												

Normal reply: AA 80 00 00 00 01 00 00 81

		t	yte	0		1		2	3		4					
	trans	n	ame	Fir	st	addre	ss	re	gister		verification					
	mit	Ċ	lata	0xA	0xAA 0x80 0x00 0x0A 0x8A											
	by	Type: F	Read con	nmand												
	radio	Registe	r addres	s: 0x000	A											
Read the		Functio	n: Read	the hard	ware v	ersion r	numb	er of the	module							
hardwar		byt	0	1	2	3	4	5	6 7		8					
e version		e	U	1		3	4	3	0	7	8					
number		na		addre			Ef	fective	offa,	ctive	verificati					
	recei	me	First	SS	reg	ister	Ca	lculatio		te.	on					
	ve	IIIC		33				n	0,	, ic	Oll					
		data	0xA	0x80	0x0	0x0	0x0	0x0	0xV	0xY	Z sum					
		data	A	OXOO	0	A	0	1	V	Y						
		The HV	V version	n numbe	r is 0x	VVYY										
		t	yte	0		1		2	3		4					
	trans	n	ame	Fir	st	addre	ss	re	gister		verification					
	mit	Ċ	name First address register verification data 0xAA 0x80 0x00 0x0C 0x8C													
	by	Type: F	Read con	nmand												
	radio	From a	ddress: (00x00												
Read the	racio	Registe	Register address: 0x000C Function: Read the software version number of the module													
software		Functio	n: Read	the softv	vare ve	ersion n	umbe	er of the 1	nodule							
version		byt	0	1	2	3	4	5	6	7	8					
number		e		•					Ů	,	0					
		na		addre			Ef	fective	effectiv		verificati					
	recei ve	me	First	SS	reg	ister	Ca	lculatio		rte	on					
								n	- 7							
		data	0xA	0x80	0x0	0x0	0x(0x0	0xV	0xY	Z sum					
			A		0			1	V	Y						
		The SV	/ version	number	is 0x											
	trans	t	yte	0	0			2	3		4					
	mit	n	ame	Fir	st	addre	ess		register		verification					
	by	Ċ	lata	0xA	AA	0x80 0x00 0x0E					0x8E					
	radio	Type: F	Read con	nmand, f	rom ac	ldress: (00x0									
Read		Registe	r addres	s: 0x000	E											
module		Function	n: Read	the mod	ule ser	ial num	ber									
serial		byte	0	1	2	3	4	5	6	7	8					
number		nam		addre			Ef	fective	effe	ctive	verificati					
	recei	e	First	SS	reg	ister	Ca	lculatio	by	/te	on					
	ve							n								
		data	0xA	0x80	0x0	0x0	0x0		0xS	0xN	sum					
			A		0	Е	0	1	S	N						
				n numbe		SSNN										
	trans	t	yte	0		1		2	3		4					
Read	mit	n	ame	Fir	st	addre			gister		verification					
input	by		lata	0xA		0x80		0x00	0x0	06	0x86					
voltage	radio			nmand, f		ldress: ()x00									
		_		s: 0x000												
		Functio	n: Read	the mod	ule inp	ut volta	ge (I	BCD enco	oding)							

														П		
		byte	0	1	2		3	4	5	6	7	+	8			
		nam			re register				ective		ective		verificati			
	recei	e		SS				Calo	culatio	b	yte		on			
	ve	1.4	0.4	0.00	0.0		0	0.0	n	0.2	Ι					
		data	0xA A	0x80	$\begin{vmatrix} 0x0 \\ 0 \end{vmatrix}$		x0	0x0 0	0x0	$\begin{vmatrix} 0x3 \\ 2 \end{vmatrix}$	0x	1	sum			
		Input v		3219m			<u> </u>			2				+		
		_	yte		0		1		2	3	3		4			trans
		n	ame	me First address register verification									mit by			
	trans mit	c	lata	0x	AA	0)x80		0x00	0x	22		0xA2		Set	radio
	by	Type: 1	rpe: Read command. This command is used to read measurement results												module	
	radio	when e	en enabling multi-slave mode.												measure	
	Tuuto	From a	ddress:	0x00											ment	
Read		_		ss: 0x00											offset	
measure			n: Read	the dist	ance m	neasu	reme	nt res	sult					\perp		
ment		byt	0	1	2	3	4	5		6:9):1	12			
results		e									+	1				
	recei	na	Firs	addr			Eff	ective	Ef	fective		gn ıl	verifica			recei
	ve	me	t	ess	regist	er	Cal	culat	i di	stance		ıali	tion			ve
				033				on	,	value	-	y	tion			
			0x		0x	0x	0x									
			AA	0x00	00	22	00	03		CCDD	0	1	sum			
		byte	0	1	2	3	3	4	5	6	7		8			
				addre		•		Effe	ective	a ffa	atirra		verificati			
		nam	e First		re	gister		Calc	ulatio		ective					trans
	trans	e ss byte on		mit												
	mit	data	0xA	0x00	0x0	0x	x1	0x0	0x0	0x0	0xY	7	sum		Turn	by
	by		A		0			0	1	0	Y				laser on or off	radio
	radio	• •								fter moo	difyin	g th	ne ID, other		or on	
			instruct ddress:	ions mu	st be ac	ijuste	ed aco	cordi	ngly;							
				oxoo ss: 0x00	10											
				s the mo		addre	SS									recei
								ess w	ill not	be lost	after į	ow	er failure.			ve
Set		byte	0	1	2		3	4	5	6	7		8			
module address				1.1		-		Effe	ective		,.		. ~ .			
address		nam	First	addre	re	gister		Calc	ulatio		ctive yte		verificati on			
		e		SS					n	0	yte		OII			
		data	0xA	0x00	0x0	0x	x1	0x0	0x0	0x0	0xY	7	sum		Single	trans
	recei		A	01100	0	()	0	1	0	Y		5411		automati	mit
	ve			s to 0x	YY (!	Note	e: Or	nly b	its [6:0] are t	aken;	oth	ner bits are		c	by radio
		ignored													measure	radio
			Note: Do not set the slave address to the broadcast address 0x7F. This address reserved for a master-slave network. When a broadcast address command												ment	
													spond with			
													only returns			
				nt result		ı uccı	05505	, u 511	igic sic	.ve ada	C 55 u	14 (omy recurs			recei
																ve
	I	1														

		byte	0	1	2	3	4 Effec	5 etive	6	7	8			na me	Firs t	addr ess	reg	is					
		nam e	First	addre ss	regi	ster	Calcu			ctive /te	verificati on			dat	0x	0x00	0x	Ι					
	trans	data	A 0 2 0 1 Z Y												AA Reply fr	rom subc	00 ordina	at					
Set module	mit by radio	From a Registe	indicates	0x00 ss: 0x001 s the offse	et to ad									From address: 0x00 Register address: 0x0022 Function: Send the measure result = 0xAABBCCDD mill decimal. Signal quality = 0									
measure ment offset		For ex	ample,		fset 0x	ZZYY					red distance 5 (-123), the				r the la	ser signa							
		value will be increased by 123 mm. If the offset 0xZZYY =0xFF85 (-123), the measured distance value will be decreased by 123 mm. To restore the original factory measurement value after modification, simply set the offset to 0.								slow	trans mit	nam	n Firs	st add									
	recei	nam	0 First	addre	2 regi	3 ister	Effect Calcu			ctive	verificati on	measure	by radio	data	0xA	0x0	00	0					
	ve	data	0xA A	0x00	0x0 0	0x1 2	0x0 0	0x0 1	0xZ Z	0xY Y	sum			Type: Write command From address: 0x00 Register address: 0x0020									
		byte	0	1	2	3	4	5	6	7	8					startup 1		1					
				nam e	First	addre ss	reg	ister	Calc	ective ulatio		ctive yte	verificati on			Same a	s single	e auto mo		2			
Turn	trans mit	data	0xA A	0x00	0x0	0xB E	0x0 0	0x0	0x0 0	0xZ Z	sum		recei ve	nam e	First	addre		r					
laser on or off	by radio	From a	Write conduction		BE									data	0xA A	0x00		0					
	ragai			the lase		on or	off. If	0xZZ	= 0x01	, the la	ser is on; if	Single quick	trans mit by	Type: V		ommand 0x00							
	recei ve	Send th	ne same									measure	radio			ess: 0x00 startup r		116					
		nam	0	1 addre	2	3		5 ective	6 effe	7 ctive	8 verificati	ment	recei ve			e auto me		_					
	trans	e	First 0xA	SS	reg 0x0	0x2		ulatio n 0x0	0x0	yte 0x0	on			byte		1 add	lre						
Single automati	mit	data Type: V	A	0x00	0	0	0	1	0	0	0x21 , and returns	Start continuo	trans	e	Firs	st	8						
c measure ment	radio	one dis		easureme				**			, 2233440	us automati c	mit by radio	data	A	0x0	00	0					
ment				ss: 0x002 the slave		e to pe	rform a	single	measu	rement	in automatic	measure ment	radio	Registe	er addre on: Sen	ess: 0x00	020						
	recei ve	byt e	0	1	2 3	3 4	. 5		6:9	10:1	12		recei	Same a		e auto mo	ode	_					

			na me	Firs t	addr ess	re	gister		alc	ctive rulati n	dis	ective tance	sign al quali ty	verifica tion
			dat a	0x AA	0x00	0x				0x 03		ABB CDD	0x01 01	verifica tion
		Fi R Fi re	rom a egiste unctio esult =	ddress: or addre on: Ser oxAA	ess: 0x0 nd the BBCC nal qual	022 meas DD n	uremonillim	eters (By he	rte6: 9), which	ch need signal	ls to be	neasuremen converted to value, the
Single slow measure	trans mit by		nam e		ad st	dre	2 res	3 gister		Calc	5 ective ulatio n		7 Pective	8 verificati
ment	radio		data	0xA	0x	:00	0x0 0	0x2	2	0x0 0	0x0	0x0	0x0	0x22
	recei	Fi R Fi Sa	rom a egiste unction ame a byte	ddress: r addro	ess: 0x0 startup e auto r	020 mode		erform 3	ns a	single 4 Effect	5	6	7	w mode
	ve		e data	First 0xA A	addr ss 0x0		region of the re	0x2 0		Calcul n 0x0	atio 0x0 1	0x0 0	otive te 0x0 2	on 0x23
Single quick measure ment	trans mit by radio	Fi R Fi	rom a egiste	ddress: r addro	ess: 0x0 startup	020 mod		erform	ns a	ı single	e meas	sureme	nt in rap	id mode
	ve	S			e auto r									0
Start	trans mit by		nam e		ad st	dre	re ₂	gister		Calc	5 ective rulatio		ective	verificat on
us automati			data	A	0x	:00	0x0 0	0		0x0 0	0x0	0x0	0x0 4	0x25
c measure ment	radio	R Fi	Type: Write command; Source address: 0x00 Register address: 0x0020 Function: Send a command to automatically measure and return distance values continuously. Same as single auto mode											

	ve											
		byte	0	1	2	3	4	5	6	7	8	
	trans	nam e	First	addre ss	regi	register		Effective Calculatio n		ctive rte	verificati on	
Start	mit by	data	0xA A	0x00	0x0 0	0x2 0	0x0 0	0x0 1	0x0 0	0x0 5	0x26	
us slow measure	radio	Type: V	Vrite co	mmand								
ment		From a	ddress:	0x00								
		_		ss: 0x0020								
	recei	Function: Start the slave device for slow continuous measurement recei Same as single auto mode										
	ve	byte	0	1	2	3	4	5	6	7	8	
					_		Effe	ctive				
		nam	First	addre	regi	ister	Calci	ılatio		ctive	verificati	
	4	e		SS			1	n		/te	on	
Start	trans mit	data	0xA	0x00	0x0	0x2	0x0	0x0	0x0	0x0	0x27	
continuo	by	uata	A	UXUU	0	0	0	1	0	6	UX27	
us rapid measure ment	radio	Type: Write command From address: 0x00 Register address: 0x0020 Function: Start the slave device to perform continuous measurement in rapid mode										
	recei ve	mode Same as	s single	auto mod								
		Same as	s single	ırs during	g the me	easuren	nent ph	ase, the	e laser r	ranging	module will	
		Same as	s single		g the me	easuren 3	nent ph			ranging	module will	
Incorrect		Same as If an erreturn a	s single	report fra	g the me:			5	6	7	8	
machine	ve	Same as If an erreturn a byte nam	s single	report fra 1 addre	g the me:	3	4	5 ctive	6 effec	7	8 verificati	
machine		Same as If an erreturn a	s single ror occu	report fra	g the me:	3	4 Effec	5 etive alatio	6 effec	7	8	
machine	ve	Same as If an erreturn a byte nam	s single ror occurs error occurs First 0xE	report fra 1 addre	the me: 2 regi 0x0	3 ster 0x0	4 Effect Calcu	5 ctive alatio 1 0x0	6 effect by 0x0	7 ctive rte 0x0	8 verificati	
machine	trans mit	Same as If an erreturn a byte nam e data	s single ror occurs error	report fra 1 addre ss 0x00	regi 0x0 0	3 ster	4 Effect Calcu	5 ctive llatio	6 effect	7 ctive	verificati on	
machine	trans mit by	mode Same as If an erreturn a byte nam e data Type: R	s single ror occu in error 0 First 0xE E deply from	addre ss 0x00	regi 0x0 0	3 ster 0x0	4 Effect Calcu	5 ctive alatio 1 0x0	6 effect by 0x0	7 ctive rte 0x0	8 verificati	
machine	trans mit by	mode Same as If an erreturn a byte nam e data Type: R From ac	s single ror occu n error 0 First 0xE E eply frodddress:	addre ss 0x00 0x00	regi 0x0 0 dinate	3 ster 0x0	4 Effect Calcu	5 ctive alatio 1 0x0	6 effect by 0x0	7 ctive rte 0x0	8 verificati	
machine	trans mit by	mode Same as If an erreturn a byte nam e data Type: R From ac Registe	s single ror occu in error 0 First 0xE Exepty froddress: or address	addre ss 0x00 om suboro	region of the modern of the mo	3 ster 0x0 0	Effective Calcuter of Calcuter	5 ctive alatio a 0x0 1	effectory 0x0 0	7 ettive rte 0x0 F	8 verificati on 0x10	
machine	trans mit by	mode Same as If an erreturn a byte nam e data Type: R From ac Registe Functio	s single ror occu in error 0 First 0xE Eeply froddress: 0 r address in: Repo	addre ss 0x00 0x00 orts the en	regi 0x0 0 dinate	3 ster 0x0 0	Effect Calcurate Ox0 0	5 ctive alatio a 0x0 1	effectory 0x0 0	7 ettive rte 0x0 F	8 verificati	
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	byte	0	1	2	3	4	5	6	7	8
trans mit by	nam e	First	addre ss	regi	ster	Effective Calculatio		effective byte		verificati on
radio	data	0xA A	0x7F	0x0 0	0x2 0	0x0 0	0x0 1	0x0 0	0x0 0	0xA0
Type: Write command From address: 0x00 Register address: 0x0020 Function: Initiate single measurements for all slaves in auto After sending this command, if the slave responds with its each slave's address status code 0x0000 (indicating no error read measurement command to retrieve the distance is measurement result will not be overwritten until the measurement command acquires a new distance value.							ith its s no erro ance re	etatus, to or) and esult. I	he host polls then sends a Each slave's	
recei ve	No repl	у								

measurement pattern

condition code

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

Status code (SDBM-60TF3)	Status code (SDBM-60TF20)	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.
		The module temperature is
		too high (> +40°C). This
0x0004	0xFFFC	error does not occur in the
		high/low-temperature
		version.
0x0005	0xFFFB	Target is beyond range
0x0006	0xFFFA	Invalid measurement result
	0 7770	The background light is too
0x0007	0xFFF9	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 attentio

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:

essential factor	Factors affecting extended	Shorten measurement factors		
essential factor	measurement range	Shorten measurement factors		
Target surface	Special reflector, reflective	A matte surface, green or blue		
rarget surface	film plate	A matte surface, green of office		
Air particles	Clean air	Dust, fog, rain, snowstorm		
Sunlight intensity	Dark environment	The target is well lit		
Daggang affacting maggin	amant a commont			

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 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.