WBT-2000 SERIES

MANUAL SWIPE MAGNETIC CARD READER/WRITER

Vision 2.0

CONTENTS

1. INTRODUCTION

WBT-2000 is manual swipe Magnetic Card reader/writer terminals with RS-232 or USB interface. It supports ISO, IBM, DIN & ANSI standard and can read/write ISO I, II, III track.

2. BASIC SPECIFICATION

WBE	TYPE	SERIES	OPTION	TRACK POSITION	INTERFACE
WB	T: Low Co. TH: Hi Co & Low Co	2	1: Mag/passbook R/W	5: ISO1/ISO2 6: ISO2/ISO3 7: ISO1/ISO2/ISO3	0: RS232 2: USB

MODEL	SIZE(mm) L*W*H	MODEL (WBT/TH-2XXX)			
		DUAL		TRIPLE	NOTE
		ISO1/2	ISO2/3	ISO1/2/3	
WBT21X0	214.5*66*59	2150	2160	2170	Lo-co, 300Oe, RS232
WBT21X2		2152	2162	2172	Lo-co, 300Oe, USB
WBTH21X0		2150	2160	2170	Hi/Lo- co, 300~4000Oe, RS232
WBTH21X2		2152	2162	2172	Hi/Lo- co, 300~4000Oe, USB
WBT29XX					CUSTOMIZE

3. SPECIFICATION

3.1 Format

Mag Card standard	ISO7811/7812		
IC Mag Card standard	ISO7816		
Reading method	F2F(FM)		
Track	Track I	Track II	Track III
	ISO II (IATA)	ISO II (ABA)	ISO III (MINTS)
Bit per Inch	210 BPI	75/210 BPI	210 BPI
Encoding Capacity	76 byte (7bit)	37 byte (5bit)	104 byte (5bit)
Card Thickness	PVC : 0.76 ± 0.08mm		

3.2 Environmental Requirements

3.2.1 Ambient Temperature

1) Storage: -20°C ~ +55°C
2) Operating: -5°C ~ +50°C

3.2.2 Ambient Relative Humidity

1) Storage: 5% ~ 95% RH
2) Operating: 20 %~ 90% RH

3.3 Physical Characteristics

3.3.1 Size: 214.5mm (W) x 66mm (D) x 59mm (H)

3.3.2 Weight: Appr.1~1.5kg

3.3.3 Power requirement:

1) Input Voltage: Lo-Co. (WBT series), DC + 5V ±5%,
Hi/Lo. (WBTH series), DC +24V ±5%,
2) Reading Current: < 100mA
3) Writing Current: Lo-Co < 100mA;
Hi-Co (2750Oe, dual tracks) < 700mA;
Hi-Co (4000Oe, triple tracks) < 2.0A

3.3.4 Operating Locus: Indoor use only

3.4 Operating Characteristics

3.4.1 Card Feeding Speed:

1) 10 ~ 150cm/s (R)
2) 10 ~ 100cm/s (W)

3.4.2 Passbook Feeding Speed:

1) 10 ~ 150cm/s(R)
2) 10 ~ 100cm/s (W)

3.4.3 Lifetime:

1) Head≥500,000 cycles
2) IC Card Contact≥300,000 cycles
3) SAM Card Contact≥600,000 cycles

3.4.4 Error Rate: less than 0.5%

4. SWITCH SET UP

4.1 Switch Set up

Set up Writing Standard

SW1	SW2	Start Bit	Stop Bit
OFF	OFF	B	F(Default)
OFF	ON	D	F
ON	OFF	BA	C
ON	ON	BA	F

Set up Writing Character Set

SW3	SW4	Character Set
OFF	OFF	Character Set VI（Default）
OFF	ON	Character Set III
ON	OFF	Character Set II
ON	ON	Character Set I

Set up Communication Byte Format

SW5	SW6	Communication Mode
OFF	OFF	N,8,1（Default）
OFF	ON	Even,7,1
ON	OFF	Odd,7,1
ON	ON	N,8,1,High speed communication mode

Set up Baud Rate

SW7	SW8	Baud Rate
OFF	OFF	9600（Default）
OFF	ON	4800
ON	OFF	2400
ON	ON	1200

When SW5 SW6 = ON ON

SW7	SW8	Baud Rate
OFF	OFF	19200
OFF	ON	38400
ON	OFF	57600
ON	ON	115200

4.2 Character Set Specification

Character Set I	ASCII	0	1	2	3	4	5	6	7	8	9	:	#	@	′	=
	HEX	30	31	32	33	34	35	36	37	38	39	3A	23	40	27	3D
ABA Code (Hex)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E

Character Set II	ASCII	0	1	2	3	4	5	6	7	8	9	:	#	@	′	=
	HEX	30	31	32	33	34	35	36	37	38	39	3A	23	40	27	3D
ABA Code (Hex)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	D

Note: When you write ASCII character = and ′, they will turn to be ABA code D and write to the magnetic stripe.

So when reading out ABA code D and E from magnetic stripe, it will turn to be ASCII character ′.

Character Set III	ASCII	0	1	2	3	4	5	6	7	8	9	:	#	@	′	=
	HEX	30	31	32	33	34	35	36	37	38	39	3A	23	40	27	3D
ABA Code (Hex)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E

Note: When you write ASCII character = and ′, they will turn to be ABA code D and write to the magnetic stripe.

So when reading out ABA code D and E from magnetic stripe, it will turn to be ASCII character =.

Character Set VI	ASCII	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>
	HEX	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E
ABA Code (Hex)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E

5. CARD STANDARDS

5.1 Specification

5.1.1 Encoding density: 210 BPI (track I/3), 75/210 BPI (track 2)

5.1.2 Encoding capacity:

Track I (Less than 76 byte)

Track II (Less than 37 byte)

Track III (Less than 104 byte)

5.1.3 Card Format:

Magnetic card (ISO 1, 2, 3 TRACK)

NULL	SS	DATA	ES	LRC

7.44mm+ 1mm

* DATA:

ISO 1: Less than 76 byte

ISO 2: Less than 37 byte

ISO 3: Less than 104 byte

6. CONNECTION

6.1 Connect the Reader to Computer or Terminal applied.

6.2 Through PC or terminal, send the reading/writing instruction, set up the reader/writer in reading/writing status

6.3 After the Led light, swipe the card

6.4 If the operation is ok, the buzzer beep one time and light green. If not, the buzzer will beep twice and light red.

7. COMMAND/RESPONSE PROTOCOL

7.1 General Command

7.1.1 Reset Command

This command makes machines reset

Function	Command
Quit Reading/writing Status by command reset	ESC 0 (1Bh 30h)
	ESC a (1Bh 61h)
Re-power on by the hardware part	ESC S (1Bh 53h)

7.1.2 Shift between Hi-co and Lo-co command

Function	Command
Shift from Lo-co to Hi-co	ESC x (1Bh 78h)
Shift from Hi-co to Lo-co	ESC y (1Bh 79h)

7.1.3 Set Density Control Command

Function	Command
Set Track II Encoding Density to 75BPI	**ESC L (1Bh 4ch)**
Set Track II Encoding Density to 210BPI	ESC H (1Bh 48h)

7.1.4 Set Start Bit Command

Start Bit Location	Command
16 mm	**ESC 6 (1Bh 36h)**
20 mm	ESC 7 (1Bh 37h)
22 mm	ESC 8 (1Bh 38h)
25 mm	ESC 9 (1Bh 39h)

7.1.5 Encoding Standards Control Command

Track	Command	Standard number
Track II	ESC 1 (1Bh 31H)	1
	ESC 2 (1Bh 32H)	2
	ESC 3 (1Bh 33H)	3
	ESC 4 (1Bh 34H)	4
Track III	ESC T 1 (1Bh 54h 31H)	1
	ESC T 2 (1Bh 54h 32H)	2
	ESC T 3 (1Bh 54h 33H)	3
	ESC T 4 (1Bh 54h 34H)	4
Dual Tracks	ESC B 1 (1Bh 42h 31H)	1
	ESC B 2 (1Bh 42h 32H)	2
	ESC B 3 (1Bh 42h 33H)	3
	ESC B 4 (1Bh 42h 34H)	4

Signification of Standards number

Number	Start	End
1	B	F
2	D	F
3	BA	C
4	BA	F

7.2 Reading/Writing Communication Protocol

7.2.1 Command Format

STX	Character: Command, Status or Date	ETX	BCC

STX, start character, Value 0x02

ETX, stop character, Value 0x03

BCC, examine character, is the XOR value of Character & ETX (Not including the STX)

When WBT2000 receive the command, it will check whether BBC is correct. If it's incorrect, it will return: STX 15H ETX BCC (02 15 03 16) and give up this command.

Note: The date has the same format for Host=>WBT2000 and WBT2000=>Host.

7.2.2 Write data

STX	% Track1data ?	; Track2data ?	+ Track3data ?	ETX	BCC

% Track1data ? means write data of Track I, "%" value is 0x25, "?" value is 0x3F. If don't write Track I, you can ignore this.

; Track2data ? means write data of Track II, ";" value is 0x3B, "?" value is 0x3F. If don't write Track II, you can ignore this.

+ Track3data ? means write data of Track III, "+" value is 0x2B, "?" value is 0x3F. If don't write Track III, you can ignore this.

When writing, machine reads the card automatically, and returns to the track date according to the format below.

STX	% Track1data ?	; Track2data ?	+ Track3data ?	ETX	BCC

If read error, response DEL (0x7F) to the relative track.

7.2.3 Read data

STX	r mode	ETX	BCC

"r" read command,

mode = '0', cancel write command

= '1'/'2'/'3'/'4'/'5'/'6'/'7' , read track 1/2/3/12/23/13/123

After swiping the card, it returns to the track date according to the format below.

STX	% Track1data ?	; Track2data ?	+ Track3data ?	ETX	BCC

If read error, response DEL (0x7F) to the relative track.

7.2.4 Set up Auto-reading function

STX	! mode	ETX	BCC

"!" read command, value 0x21

mode = '0' Forbid "blind reading"

= '1'/'2'/'3'/'4'/'5'/'6'/'7', auto-read track 1/2/3/12/23/13/123, data of returning to the corresponding track

= '8' , auto-reading all the tracks, data of returning to the correct track

If the auto-reading function is on, there's no need to send command from host, only if swipe the card, the machine will return the date to the corresponding track.

STX	% Track1data ?	; Track2data ?	+ Track3data ?	ETX	BCC

If read error, response DEL (0x7F) to the relative track.

7.2.5 Set up the clue

STX	i mode	ETX	BCC

"i" clue command, value 0x69

mode = '0' buzzer one time, light green.

= '1' buzzer twice, light green.

Return after carrying out

STX	10H	ETX	BCC

This command will make the machine quit the reading/writing status, so can be used as command of stopping reading/writing command.

8. NOTE

8.1 Dirty, scraped card cannot be used.

8.2 Keep the card away from the magnetism object or damp places.