QPO-600-USB

MANUAL SWIPE MAGNETIC STRIPE CARD READER WRITER

CONTENTS

Section 1: Introduction

QPO-600-USB is a compact magnetic stripe card reader and writer that conforms to ISO standards. QPO-600-USB is compatible with any device with a USB interface. QPO-600-USB is the smallest manual magnetic stripe card reader and writer. A card is read and write by sliding it, stripe down and through the slot forward. LED indicator on the Reader panel provides the operator with continuous status of the operations. Widely used in financial, commercial, transportation, hotel services, security, and other areas using magnetic Card Reader/Writer.

Feature:

- Designed to offer a card reading/writing solution for ISO7811-6/ANSI formats.
- Functions: Read, Write, Copy, Erase, Compare, Save to File, File to Write.
- It reads and writes up to 3 tracks of data, decoding/encoding and verifying up to 3 tracks of data simultaneously. single direction swipe.
- Can read or write all Hi-Co or loco magnetic cards, Hi-Co and Lo-Co: all compatible (300 to 4,000oe).
- Plug-and-play function, easy to operate, Compatible with USB specification Revision 2.0
- It's so small that easy to carry for moving or on trip.
- Powered through the USB – no external power supply required
- LED for status
- Many programmable configuration options

Accessories of QPO-600-USB

- 1.Power and Signal cable (USB).
- 2.Utility disk (A/P S/W).
- 3.Specification and Programmer's manual.

Section 2:Specification

ITEM	SPECIFICATION
Standard	ISO7811
Electrical	
Consumption	Current/operating Typical 350mA Max
	600mA plus for each writing track
Communication	Standard RS232 signal voltage levels. Default, 9600 Baud, None Parity, 8 bits
Power supply	DC +5V (via USB directly)
Interface	
Port	USB
Mechanical	
Body	ABS 94V-0 / Metal housing optional
Swipe	Manual, single direction
Outline	140*43*44 mm
Weight	
Environment	
Operation	-10ºC to 60ºC
	10 to 85% humidity, non condensing
Storage	-30ºC to 70ºC
	10 to 90% humidity, non condensing
Performance	
Read /Write	Track1,2,3 R/W Hi-Co&Lo-Co(300~4000 oe)
Read Circuit	Track 1&3 210bpi
	Track 2,75 or 210 bpi
Bit per Char	5-7 bit per char.
Media Speed	Read, 5-50 ips (read speed 5-40 ips for track 2 at 210bpi)
	Write, 5-30 ips
Media Coercivity	Read 300-4000 Oe Mag. Card
	Write 300-4000 Oe Mag. Card
Media Thickness	0.76-1.2mm
Jitter Card	Read bit to bit interval <+/-15% card
	Write bit to bit interval <+/-10%,Sub interval<+/-12% at 30ips
Low amplitude Card	Read 60% for both 75& 210bpi
Error Rate	Read < 0.5%
	Write < 0.8%
Media Swipe	Head life 1,000,000 passes for both read & write head
Compliant Systems	Windows 98/2000/me/xp/vista/7/8 (32&64), Mac OS

Section 3:Operation manual

USB CONNECTION

Connect the USB cable to a USB port on the host. The LED Indicator the Windows Plug and Play Setup, and the physical mounting of the unit.

WINDOWS PLUG AND PLAY SETUP

On hosts with the Windows operating system, the first time the device is plugged into a USB port, Windows will pop up a dialog box, which will guide you through the process of installing a device driver for the device. After this process is completed once, Windows will no longer request this process as long as the device is plugged into the same USB port. If Windows prompts for the file locations, insert the CD that was used to install Windows on your PC and point Windows to the root directory of the CD. Windows should find all the files it needs there.

LED INDICATOR

The LED indicator will be either off, red, pink, or blue. When the device is not powered, the LED will be off. When the device is first plugged in, the LED will be blue. The LED will turn pink indicating that the device is ready for read. When a card is being written , the LED will be red.

CARD READ

A card may be swiped through the Reader slot when the LED is pink. The magnetic stripe must face toward the back (the side with the LED) and may be swiped in forward. If there is data encoded on the card, the device will attempt to decode the data and then send the results to the host.

CARD WRITE

A card may be swiped through the QPO-600-USB slot when the LED is red. The magnetic stripe must face toward the back(the side with the LED) and may be swiped in forward. The device will attempt to encode the data to the card.

Section 4:Utilities Test Program

Every QPO-600-USB comes with a utilities test program disk that includes a Windows version. This program is to verify and demonstrate the functionality of the QPO-600-USB. In some cases, it can be used as a card reading and writing program.

System Requirement

1. 80286 PC/AT compatibles or later model with color display.
2. Either the following operating systems: Windows98,2000,XP,VISTA，Win7
3. 256M available conventional memory.
4. A free USB port.

Test Program Installation

User shall follow the steps below in order to install test program.

A. Connect QPO-600-USB to USB port.

B. Execute test program from the subdirectory of 'Demo Program.exe' .

C. The test program will auto-detect communication port. If there is any errors occurred, it'll appear in the information dialog box after opening the program.

D. If "**Not Find Reader/Writer!"** appears in the information dialog box after opening the program, check to see that the USB connector is plugged into the correct USB port

E. When the test program is opened, you'll see the main window of the READER/WRITER UTILITY PROGRAM. From this main window you can activate all functions by clicking the appropriate buttons and following the on screen instructions.

Section 5: Command and Response

<ESC>	Control character named
[[[[[sname]	Special string named sname, meaning can be found in section 7. ie.[Data Block] [Status Byte] [Select Byte] etc.
X	Standard ANSI character

Command Description:

1. Command: **RESET**
   Command code: <ESC> a
   Hex code: 1B 61
   Response: none
   Description: This command resets the QPO-600-USB to initial state.

2. Command: READ (ISO format only)
   Command code: <ESC> r
   Hex code: 1B 72
   Response: [Data Block] <ESC> [Status Byte]
   Description: This command request QPO-600-USB to read a card swiped and respond with the data read.

3. Command: WRITE (ISO format only)
   Command code: <ESC> w [Data Block]
   Hex code: 1B 77 [Data Block]
   Response: <ESC> [Status Byte]
   Description: This command request QPO-600-USB to write the Data Block into the card swiped.

4. Command: Communication test
   Command code: <ESC> e
   Hex code: 1B 65
   Response: <ESC> y [1B] [79]
   Description: This command is used to verify that the communication link between computer and QPO-600-USB is up and good.

5. Command: All LED off
   Command code: <ESC> <81>
   Hex code: 1B 81
   Response: none
   Description: This command is used to turn off all the LEDs.

6. Command: All LED on
   Command code: <ESC> <82>
   Hex code: 1B 82
   Response: none
   Description: This command is used to turn on all the LEDs.

7. Command: GREEN LED on
   Command code: <ESC> <83>
   Hex code: 1B 83
   Response: none
   Description: This command is used to turn on the Green LED.

8. Command: YELLOW LED on
   Command code: <ESC> <84>
   Hex code: 1B 84
   Response: none
   Description: This command is used to turn on the Yellow LED.

9. Command: RED LED on
   Command code: <ESC> <85>
   Hex code: 1B 85
   Response: none
   Description: This command is used to turn on the Red LED.

10. Command: Sensor test
   Command code: <ESC> <86>
   Hex code: 1B 86
   Response: <ESC> 0 (1B 30) if test ok
   Description: This command is used to verify that the card sensing circuit of QPO-600-USB is working properly.
   QPO-600-USB will not response until a card is sensed or receive a RESET command.

11. Command: Ram test
   Command code: <ESC> <87>
   Hex code: 1B 87
   Response: <ESC> 0 (1B 30) ram test ok; <ESC> A (1B 41) ram test fail
   Description: This command is used to request QPO-600-USB to perform a test on its on board RAM.

12. Command: Set leading zero

Command code: <ESC> z [leading zero of track 1 & 3] [leading zero of track 2]

Hex code: 1B 7A [00~ff] [00~ff]

Response: <ESC> 0 (1B 30) set ok

<ESC> A (1B 41) set fail

Description: This command is used to set how many leading zeros will be written before the card data starts, and

the space should calculated as [leading zero] X25.4 / BPI (75or210) =mm

Default setting of leading zero: [3D] [16]

TK1 & TK3: [3D] means leading zero=61

TK2: [16] means leading zero=22

13. Command: Check leading zero

Command code: <ESC> l

Hex code: 1B 6C

Response: 1B [00~ff] [00~ff]

Description: This command is used to ask QPO-600-USB the present setting number of leading zeros.

14. Command: Erase card

Command code: <ESC> c [Select Byte]

Hex code: 1B 63 [Select Byte]

Response: <ESC> 0 [1B] [30] command Select Byte ok

<ESC> A [1B] [41] command Select Byte fail

Description: This command is used to erase the card data when card swipe.

*[Select Byte] format:

00000000: Track 1 only

00000010: Track 2 only

00000100: Track 3 only

00000011: Track 1 & 2

00000101: Track 1 & 3

00000110: Track 2 & 3

00000111: Track 1, 2 & 3

15. Command: Select BPI

Command code: <ESC> b [Density]

Hex code:

track2：1B 62 [D2 or 4B] // [D2]: 210bpi, [4B]: 75bpi

track1：1B 62 [A1 or A0] // [A1]: 210bpi, [A0]: 75bpi

track3：1B 62 [C1 or C0] // [C1]:210bpi, [C0]: 75bpi

Response: <ESC> 0 [1B] [30] select ok

<ESC> A [1B] [41] select fail

Description: This command is used to select the density

16. Command: Read raw data
Command code: <ESC> m
Hex code: 1B 6D
Response: [Raw Data Block] <ESC> [Status Byte]
Description: This command requests QPO-600-USB to read a card swipe but send without ASCII decode.
Refer to [Raw Data Block] & [Raw Data] format.

17. Command: Write raw data
Command code: <ESC> n [Raw Data Block]
Hex code: 1B 6E [Raw Data Block]
Response: <ESC> [Status Byte]
Description: This command requests QPO-600-USB to write raw Data Block into the card swiped.
Refer to [Raw Data Block] & [Raw Data] format.

18. Command: Get device model
Command code: <ESC> t
Hex code: 1B 74
Response: <ESC> [Model] S
Description: This command is used to get the model of QPO-9600-USB.

19. Command: Get firmware version
Command code: <ESC> v
Hex code: <ESC> 76
Response: <ESC> [version]
Description: This command can get the firmware version of QPO-9600-USB.

20. Command: Set BPC
Command code: <ESC> o [tk1bit][tk2bit][tk3bit]
Hex code: <ESC> 6F [05-08][05-08][05-08]
Response: <ESC> 30 [tk1bit][tk2bit][tk3bit]
Description: This command is used to set the bit per character of every track.

21. Command: Set Hi-Co
Command code: <ESC> x
Hex code: 1B 78
Response: <ESC> 0
Description: This command is used to set QPO-9600-USB status to write Hi-Co card.

22. Command: Set Low-Co
Command code: <ESC> y
Hex code: 1B 79
Response: <ESC> 0
Description: This command is used to set QPO-9600-USB status to write Low-Co card.

23. Command: Get Hi-Co or Low-Co status
Command code: <ESC> d
Hex code: 1B 64
Response: <ESC> H -------to write Hi-Co : <ESC> L ------- to write Low-Co
Description: This command is to get QPO-9600-USB write status.

Section 6:Data Format

* [Data Block] format:

Start Field	R/W Data Field		Ending Field
Command code	<ESC> s	[Card data]	? <FS> <ESC> [Status]
Hex code	1B 73	[Card data]	3F 1C 1B [Status]

* [Card data] format:

Card Data	
Char Code	<ESC> 1[string1] <ESC> 2 [string2] <ESC> 3 [string3]
Hex Code	1B 01 [string1] 1B 02 [string2] 1B 03 [string3]

* [Status Byte] format:

Status	description	HEX	ASCII
Ok	If read, write or command ok	30h	0
Error	Write or read error	31h	1
	Command format error	32h	2
	Invalid command	34h	4
	Invalid card swipe when in write mode	39h	9

* Note:

1. When [Status Byte] equal 39h means card moving error.
2. None available and none data tracks will not be transmitted when swipe of card.

For example, when read card with data encoded on track 2 only for QPO-9600-USB, it will transmit data like **1B 73 1B 01 1B 02 [string**] **3F 1C**, for no data on track 1 so it shown 1B 01 only.

* [Raw Data Block] format:

Start Field	R/W Data Field		Ending Field
Command code	<ESC> s	[Raw data]	? <FS> <ESC> [Status]
Hex code	1B 73	[Raw data]	3F 1C 1B [Status]

* [Raw Data] format:

Raw Data	
Char Code	<ESC>1[L1][string1]<ESC>2[L2][string2]<ESC>3[L3][string3]
Hex Code	1B 01[L1][string1]1B 02[L2][string2]1B 03[L3][string3]

Note:

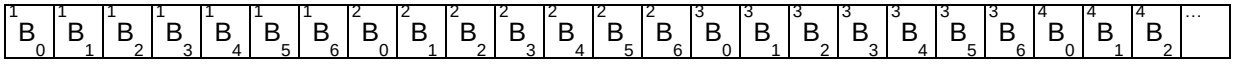
1. [L1], [L2], [L3] is the length of [string1],[string2],and [string3]
2. None available and none data tracks will not output when swipe of card.

For example, when read card (encoded data on track 2 only) on QPO-9600-USB, it will transmit data like **1B 73 1B 01 00 1B 02 [L2] [string] 3F 1C**.

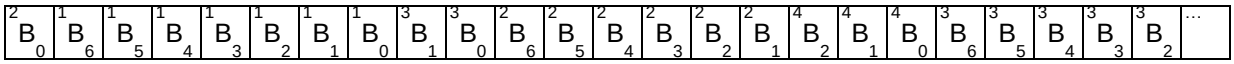
* [Raw Data] bit orientation:

Track 1 for 8 BPC

Read

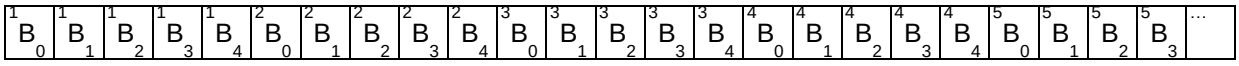


Write

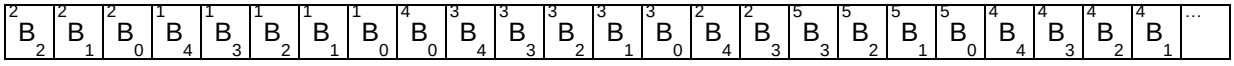


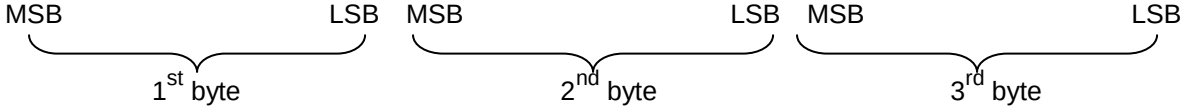
Track 2 & 3 for 8 BPC

Read



Write





*Refer to Section 9 ADDENDUM.

Section 7: Communication Sequence

The examples below assumes data on track1, 2 & 3 to be 01, 23, 45 respectively.

➢ QPO-600-USB INITIALIZATION

HOST	Direction	QPO-600-USB
Command code: <ESC>a HEX code: [1B][61]	→	(Reset)
Command code: <ESC>e HEX code: [1B][65]	(Serial port test) ←	
	→	Command test ACK: <ESC> y HEX code: [1B][79]
Command code: <ESC>a HEX code: [1B][61]	←	(Reset)

➢ Write Data to QPO-600-USB

HOST	Direction	QPO-600-USB
Command code: <ESC>w<ESC>s<ESC>[01]01 <ESC>[02]23<ESC>[03]45?<FS> HEX code: [1B][77][1B][73][1B][01][30][31][1B] [02][32][33][1B][03][34][35][3F][1C]	→ (write command)	
	← (status ACK)	(Wait until swipe card) Command ACK: <ESC> <status> HEX code: [1B][status] Status =[30] no error Status =[31]~[3F] if error

➢ Read Data to QPO-600-USB

HOST	**Direction**	**QPO-600-USB**
Command code: <ESC> r HEX code: [1B][72]	(read command) →	
	← (status ACK)	(Wait until swipe card) Command ACK: <ESC>s<ESC>[01]%01?<ESC>[02];23?<ESC>[03];45??<FS><ESC><status> HEX code: [1B][73][1B][01][25][30][31][3F][1B][02][3B][32][33][3F][1B][03][3B][34][35][3F][3F][1C][1B][status] Status=[30] ok Status=[31]~[3F] if error

* [XX] = HEX Code XX

Section 8: Addendum

➢ Write Data to Magnetic Card

The WRITE command:

Command	WRITE
Command code	<ESC> w **[Data Block]**
Hex code	1B 77 **[Data Block]**
Response	<ESC> [Status Byte]
Description	This command request QPO-600-USB to write the Data Block into the card swiped.

[*Data Block*] format:

Start Field	R/W Data Field		Ending Field
Command code	<ESC> s	[*card data*]	?<FS>
HEX code	1B 73	[*card data*]	3F 1C

[*card data*] format:

card data	
Char. code	<ESC>[01] [string] <ESC> [02] [string] <ESC> [03] [string3]
HEX code	1B 01 [string1] 1B 02 [string2] 1B 03 [string3]

As an example the following information will be written to the card:
Track1: %ABC123?
Track2: ;12345?
Track3: ;12345?

HOST	DIRECTION	QPO-600-USB
Command code: <esc>w<ESC>s<ESC>[01]ABC123<ESC>[02]12345<ESC>[03]12345?<FS> HEX code: [1B][77][1B][73][1B][01][41][42][43][31][32][33][1B][02][31][32][33][34][35][1B][03][31][32][33][34][35][3F][1C]	(write command) →	

After send command to QPO-600-USB	Yellow LED on, then swipe card	write data to the magnetic card
	(status ACK) ←	(wait until swipe card) Command ACK: <ESC><status> HEX code: [1B][status] Status = [30] no error Status = [31] ~ [3F] if error

➢ Write Raw Data to Magnetic Card

Converting Card Data Information to Hexadecimal for the Binary Write Function

Converting track one ASCII information into HEX

	B3	B2	B1	B5 B0 B4	0 0	0 1	1 0	1 1
0	0	0	0	0	(sp)	0	@	P
1	0	0	0	1	!	1	A	Q
2	0	0	1	0	“	2	B	R
3	0	0	1	1	#	3	C	S
4	0	1	0	0	$	4	D	T
5	0	1	0	1	%	5	E	U
6	0	1	1	0	&	6	F	V
7	0	1	1	1	‘	7	G	W
8	1	0	0	0	(	8	H	X
9	1	0	0	1	)	9	I	Y
A	1	0	1	0	*	:	J	Z
B	1	0	1	1	+	;	K	[
C	1	1	0	0	`	<	L	\
D	1	1	0	1	,	=	M	]
E	1	1	1	0	.	>	N	^
F	1	1	1	1	/	?	O	_

Converting track two and three ASCII information into HEX

Data	p	B3	B2	B1	B0
0	1	0	0	0	0
1	0	0	0	0	1
2	0	0	0	1	0
3	1	0	0	1	1
4	0	0	1	0	0
5	1	0	1	0	1
6	1	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	1	1	0	0	1
:	1	1	0	1	0
; (*)	0	1	0	1	1
<	1	1	1	0	0
=	0	1	1	0	1
>	0	1	1	1	0
? (*)	1	1	1	1	1

* Note: The “;” is start sentinel and “?” is end sentinel of tk2 & 3 of ISO format.

As an example the following information will be written to the card:
Track1: %ABC123?
Track2: ;12345?
Track3: ;12345?
We use three different data bits to write raw data on the cards. The procedures are listed as below:

08, 08, 08 BITS

Set each track as 08.

First of all, set BPC command:
1B, 6F, 08, 08, 08
Present the information to the card encoder, as follows:

Start Field	1B6E1B73
Track1 header	1B01
Length	08
Track1 data	C5B07814954E3E2A
Track header	1B02
Length	05
Track2 data	2B8849EAAF
Track3 header	1B03
Length	05
Track3 data	2B8849EAAF
Ending Field	3F1C

Transfer the track1 data to HEX under 08 bits:

	B0	B1	B2	B3	B4	B5	P
%	1	0	1	0	0	0	1
A	1	0	0	0	0	1	1
B	0	1	0	0	0	1	1
C	1	1	0	0	0	1	0
1	1	0	0	0	1	0	1
2	0	1	0	0	1	0	1
3	1	1	0	0	1	0	0
?	1	1	1	1	1	0	0
LRC	0	1	0	1	0	1	0

Calculate Odd Parity (P column)
If there is an Even Number of 1's in the row of data for each character, put a 1 in the P column. Other wise, put a 0 in the column.

LRC: If there is an Even Number of 1's in the column of data for each character, put a 0 in the LRC row. Other wise, put a 0 in the row. The last LRC will be considered as the parity rule of this row.

B0	B1	B2	B3	B4	B5	B6	B7	
1	0	1	0	0	0	1	1	
0	0	0	0	1	1	0	1	
0	0	0	1	1	1	1	0	
0	0	1	0	1	0	0	0	
1	0	1	0	1	0	0	1	
0	1	1	1	0	0	1	0	
0	1	1	1	1	1	0	0	
0	1	0	1	0	1	0	0	

B7	B6	B5	B4	B3	B2	B1	B0	HEX
1	1	0	0	0	1	0	1	C5
1	0	1	1	0	0	0	0	B0
0	1	1	1	1	0	0	0	78
0	0	0	1	0	1	0	0	14
1	0	0	1	0	1	0	1	95
0	1	0	0	1	1	1	0	4E
0	0	1	1	1	1	1	0	3E
0	0	1	0	1	0	1	0	2A

Transfer track 2 (track 3) data to HEX under 08 bits:

	B0	B1	B2	B3	P
;	1	1	0	1	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	1
4	0	0	1	0	0
5	1	0	1	0	1
?	1	1	1	1	1
LRC	1	0	1	0	1

B0	B1	B2	B3	B4	B5	B6	B7
1	1	0	1	0	1	0	0
0	0	0	1	0	0	0	1
1	0	0	1	0	0	1	0
0	1	0	1	0	1	1	1
1	1	1	1	0	1	0	1

B7	B6	B5	B4	B3	B2	B1	B0	HEX
0	0	1	0	1	0	1	1	2B
1	0	0	0	1	0	0	0	88
0	1	0	0	1	0	0	1	49
1	1	1	0	1	0	1	0	EA
1	0	1	0	1	1	1	1	AF

07, 05, 05 BITS

Set TK1, TK2 & TK3 as 07, 05, 05

1B, 6F, 07, 05, 05

First of all, set BPI command:

Present the information to the card encoder, as follows:

Start Field	1B6E1B73
Track1 header	1B01
Length	09
Track1 data	456162235152131F 2A
Track2 header	1B02
Length	08
Track2 data	0B01021304151F15
Track3 header	1B03
Length	08
Track3 data	0B01021304151F15
Ending Field	3F1C

Transfer the track1 data to HEX under 07 bits:

	B0	B1	B2	B3	B4	B5	P
%	1	0	1	0	0	0	1
A	1	0	0	0	0	1	1
B	0	1	0	0	0	1	1
C	1	1	0	0	0	1	0
1	1	0	0	0	1	0	1
2	0	1	0	0	1	0	1
3	1	1	0	0	1	0	0
?	1	1	1	1	1	0	0
LRC	0	1	0	1	0	1	0

Calculate Odd Parity (P column)

If there is an Even Number of 1's in the row of data for each character, put a 1 in the P column. Other wise, put a 0 in the column.

	Add	P	B5	B4	B3	B2	B1	B0	HEX
%	0	1	0	0	0	1	0	1	45
A	0	1	1	0	0	0	0	1	61
B	0	1	1	0	0	0	1	0	62
C	0	0	1	0	0	0	1	1	23
1	0	1	0	1	0	0	0	1	51
2	0	1	0	1	0	0	1	0	52
3	0	0	0	1	0	0	1	1	13
?	0	0	0	1	1	1	1	1	1F
LRC	0	0	1	0	1	0	1	0	2A

HEX

	B3	B2	B1	B0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Transfer track 2 (track 3) data to HEX under 05 bits:

	B0	B1	B2	B3	P
;	1	1	0	1	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	1
4	0	0	1	0	0
5	1	0	1	0	1
?	1	1	1	1	1
LRC	1	0	1	0	1

	Add 0	Add 0	Add 0	P	B3	B2	B1	B0	HEX
;	0	0	0	0	1	0	1	1	0B
1	0	0	0	0	0	0	0	1	01
2	0	0	0	0	0	0	1	0	02
3	0	0	0	1	0	0	1	1	13
4	0	0	0	0	0	1	0	0	04
5	0	0	0	1	0	1	0	1	15
?	0	0	0	1	1	1	1	1	1F
LRC	0	0	0	1	0	1	0	1	15

06, 05, 06 BITS

Set TK1, TK2 & TK3 as 06, 05, 06

First of all, set BPI command:

1b, 6F, 06, 05, 06

Present the information to the card encoder, as follows:

Start Field	1B6E1B73
Track1 header	1B01
Length	09
Track1 data	052122231112131F 2A
Track2 header	1B02
Length	08
Track2 data	0B01021304151F15
Track3 header	1B03
Length	08
Track3 data	0101020304051F1F
Ending Field	3F1C

Transfer track1 data to HEX under 06 bits:

	B0	B1	B2	B3	B4	B5
%	1	0	1	0	0	0
A	1	0	0	0	0	1
B	0	1	0	0	0	1
C	1	1	0	0	0	1
1	1	0	0	0	1	0
2	0	1	0	0	1	0
3	1	1	0	0	1	0
?	1	1	1	1	1	0
LRC	0	1	0	1	0	1

	Add 0	Add 0	B5	B4	B3	B2	B1	B0	HEX
%	0	0	0	0	0	1	0	1	05
A	0	0	1	0	0	0	0	1	21
B	0	0	1	0	0	0	1	0	22
C	0	0	1	0	0	0	1	1	23
1	0	0	0	1	0	0	0	1	11
2	0	0	0	1	0	0	1	0	12
3	0	0	0	1	0	0	1	1	13
?	0	0	0	1	1	1	1	1	1F
LRC	0	0	1	0	1	0	1	0	2A

Transfer track 2 data to HEX under 05 bits:

	B0	B1	B2	B3	P
;	1	1	0	1	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	1
4	0	0	1	0	0
5	1	0	1	0	1
?	1	1	1	1	1
LRC	1	0	1	0	1

	Add 0	Add 0	Add 0	P	B3	B2	B1	B0	HEX
;	0	0	0	0	1	0	1	1	0B
1	0	0	0	0	0	0	0	1	01
2	0	0	0	0	0	0	1	0	02
3	0	0	0	1	0	0	1	1	13
4	0	0	0	0	0	1	0	0	04
5	0	0	0	1	0	1	0	1	15
?	0	0	0	1	1	1	1	1	1F
LRC	0	0	0	1	0	1	0	1	15

Transfer track 3 data to HEX under 06 bits:

	B0	B1	B2	B3	B4	B5
!	1	0	0	0	0	0
1	1	0	0	0	0	0
2	0	1	0	0	0	0
3	1	1	0	0	0	0
4	0	0	1	0	0	0
5	1	0	1	0	0	0
?	1	1	1	1	1	0
LRC	1	1	1	1	1	0

	Add 0	Add 0	B5	B4	B3	B2	B1	B0	HEX
!	0	0	0	0	0	0	0	1	01
1	0	0	0	0	0	0	0	1	01
2	0	0	0	0	0	0	1	0	02
3	0	0	0	0	0	0	1	1	03
4	0	0	0	0	0	1	0	0	04
5	0	0	0	0	0	1	0	1	05
?	0	0	0	1	1	1	1	1	1F
LRC	0	0	0	1	1	1	1	1	1F