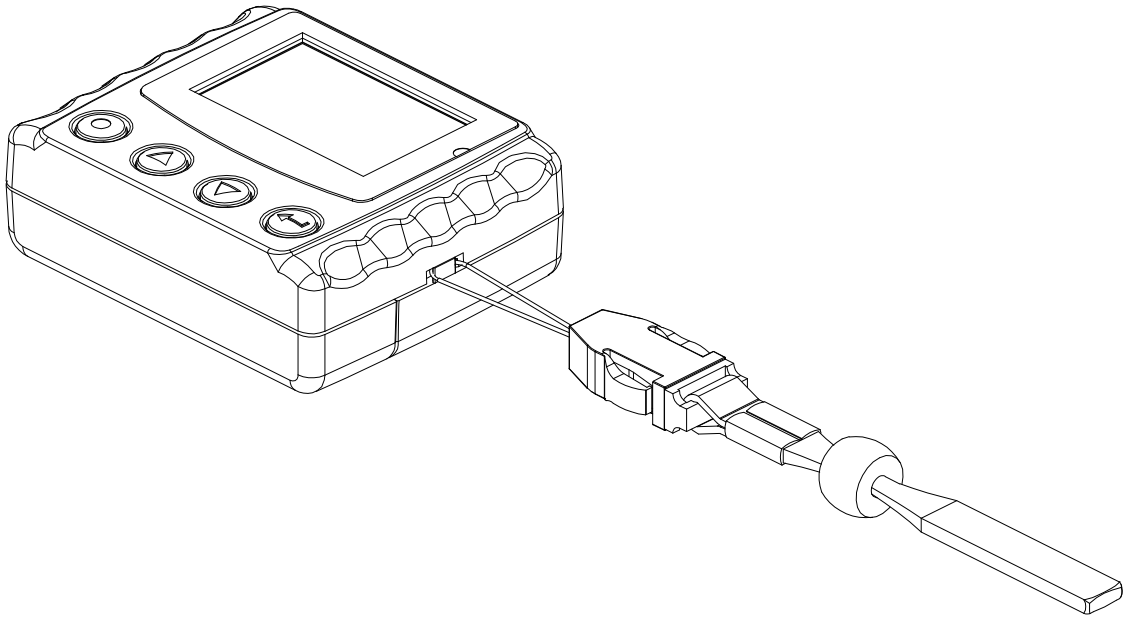
MSR120 Series



Portable 3 Tracks Magnetic Card Reader with LCD User's Manual

Manual Part Number : TM971030 Rev : 01 MAY 2010

REVISIONS

Rev Number	Date	Notes
01	MAY 2010	Initial Release

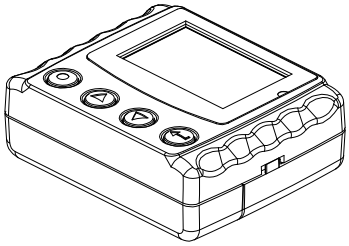
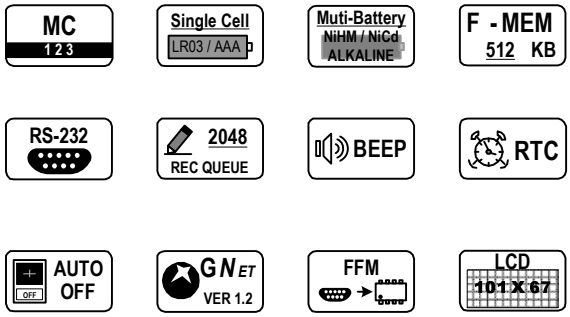
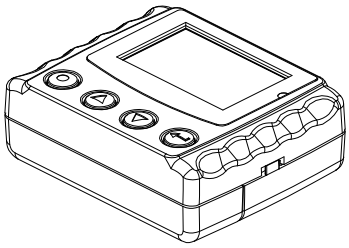
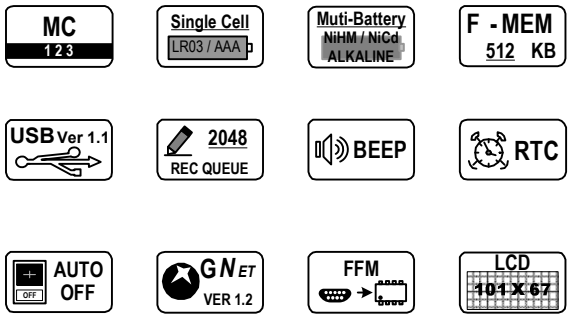
Contents

FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Information

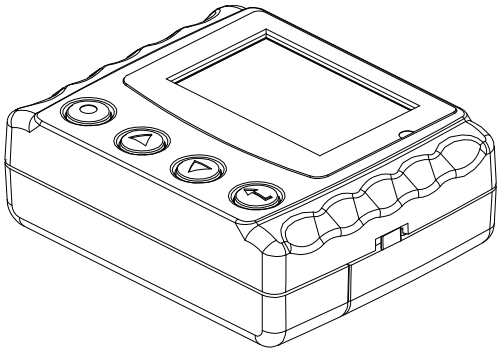
MSR120 Series Magnetic Swipe Reader

MACHINE TYPE	FUNCTION
 **MSR120** **RS232 Interface**	
 **MSR120U** **USB Interface**	

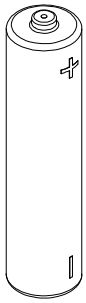
Read the instructions on your device before installing batteries

1. Insert batteries into your device properly, with the (+) and (-) terminals aligned correctly.
2. Discharged batteries should be removed from equipment to prevent possible damage.
3. Store the batteries in a cool and dry place. [Batteries should be stored at temperatures between 50˚F (10˚C) and 77˚F (25˚C), with relative humidity not exceeding 65 percent. Refrigeration of alkaline batteries is not necessary because of their very good capacity retention. Excessive temperature cycling and storage at temperatures greater than 77˚F (25˚C) should be avoided to maximize shelf life.]
4. Remove batteries from the electrical device if the device is not going to be used for a long time.
5. Keep battery contact surfaces and battery compartment contacts clean by rubbing them with a clean pencil eraser or a rough cloth each time you replace batteries.
6. Keep batteries away from children. If swallowed, contact a physician at once.
7. Don't recharge a battery unless it is specifically marked "rechargeable". Attempts to recharge an alkaline battery may cause an imbalance within the cell, leading to gassing and possibly explosion on either charge or discharge cycles.
8. Don't dispose of batteries in a fire—they may rupture or leak.
9. Don't carry loose batteries in a pocket or purse with metal objects like coins, paper clips, etc. This will short-circuit the battery, generating high heat.

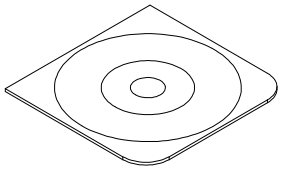
■ Standard Package



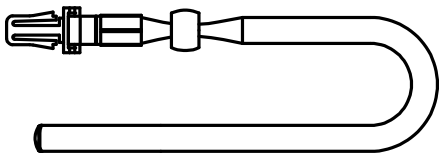
Main unit
(MSR120)



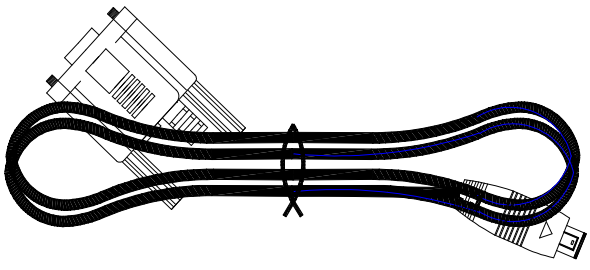
LR03-AAA ALKALINE 1.5V Battery
(BAT-T0010)



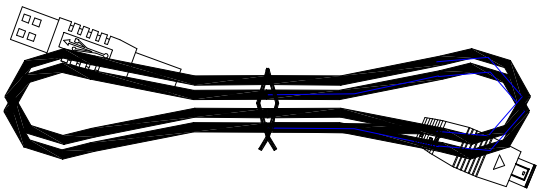
CD-ROM
(DISK5424)



Chain Sling
(TM09F1001)



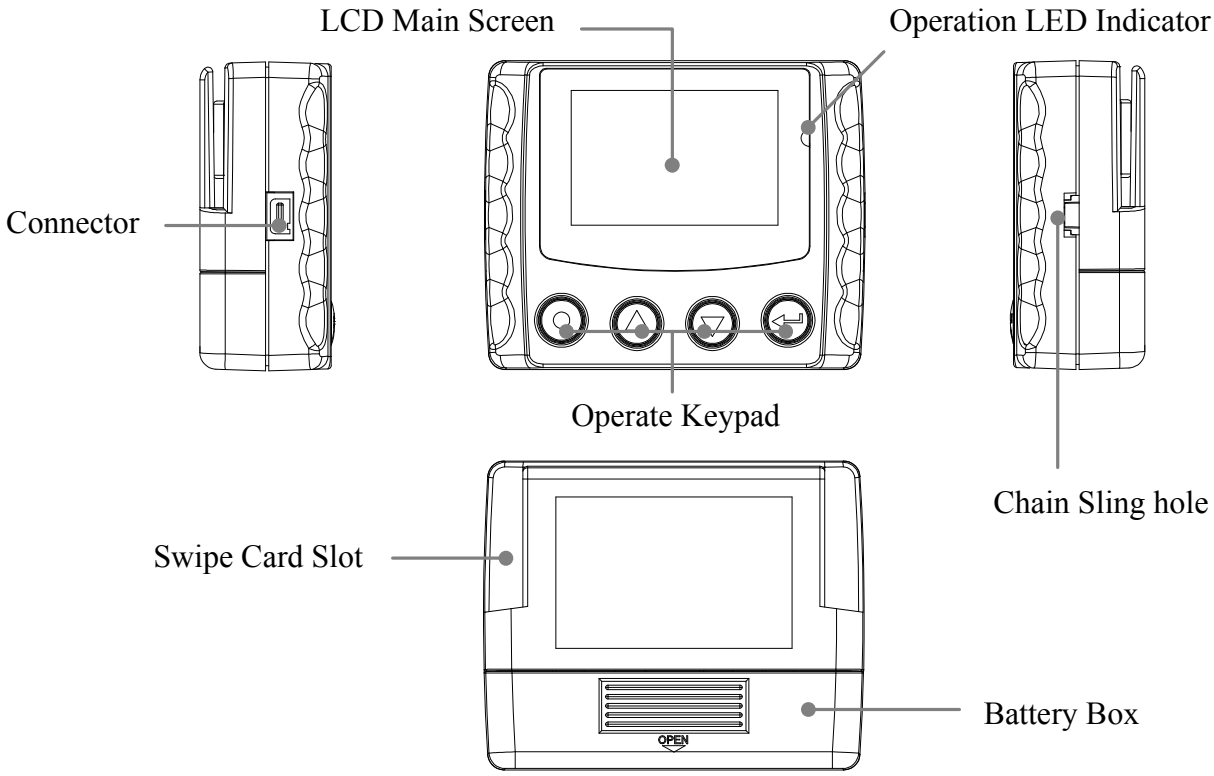
RS232 Cable for MSR120 series
(WAS-T0017)



USB Cable for MSR120U series
(WAS-T0233)

Technical And Operational Description

Front Panel and Operations



- **Swipe Card Slot**
  Swipe the card through the entire length of the slot to read.

- **Operation LED Indicator**
  When encountering erroneous input, defective card, misread,bad memory or incorrectly encoded data and so on, the device will turn on the ERROR indicator .

- **LCD Main Screen**
  Indicating the battery is ready ,charging progress , charge done, charge suspend in charge mode or low battery in operational mode.

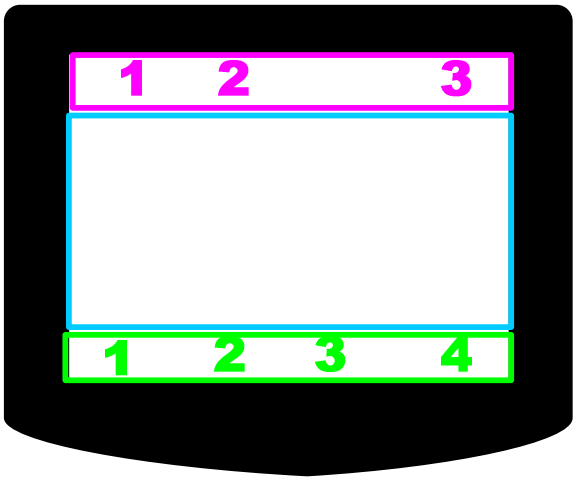
- **Connector**
  For connection to host computer and external Power .

- **Battery Box**
  Put the battery in box and hold battery .

- **Operate Keypad**
  Turn the MSR120 on/off power and Operate.

- **Chain Sling Hole**
  Connect to chain sling.

■ LCD Display



Status Function Area

Main Display Area

Keypad Guidance Area

● Status Function Area

1. Power Status

Battery Power Supply

Low Battery Power Supply

External Power Supply

2. Decode Status

Track 1 be Decoded

Track 2 be Decoded

Track 3 be Decoded

3. Guidance Number

000003	Current Record Number of Display or Store
2	Main Menu Item
2-1	Sub-Menu Item

● Main Display Area

Display Date & Week & Time , Menu Item , Record Data , Parameter Setting , Other Information

● Keypad Guidance Area

1. Corresponding Key -

Power /Exit / Back / Cancel / No Key Function

2. Corresponding Key -

Up / Up scroll / Decrease Key Function

3. Corresponding Key -

Down / Down scroll / Increase Key Function

4. Corresponding Key -

Menu / Enter / Save / Next / Yes Key Function

■ Function Menu

1. Profiles	**1-1. Machine ID**	Display Machine ID - 2 Character
	1-2. User Name	Display User Name - 16 Character
	1-3. Display Format	Set Display Mode - Track Series Track Parallel Credit Card
2. Setting	**2-1. BackLight**	Set Back Light Duration - 00 ~ 255 Second
	2-2. Auto Power Off	Set Auto Power Off Duration - 00 ~ 255 Second
	2-3. Power Mode	Set Power Mode - Switch Mode Auto Power Off Mode
	2-4. Sound	Set Operate Sound - ON OFF
	2-5. Reset	Reset Default - BackLight = 15 second Auto Power Off = 30 second Power Mode = Switch Mode Sound = ON
3. Database	**3-1. Status**	Display Memory Status - Used Space, Unused Space, Total Space
	3-2. View	Display all records in memory
4. Calendar	**4-1. Date Format**	Set Date Format Select - Year / Month / Date Date / Month / Year Month / Date / Year
	4-2. Set Date/Time	Set Date - Year, Month, Date Set Time - Week, Hour, Minute, Second
5. Information	**5-1. Product Name, Product Description, Firmware Version**	

■ Display Information

Exceptional Indicator

LCD Display message	Description	Counterplot
Check RTC !	The RTC is malfunctioning (After swipe card)	Setting Date and Time
FLASH Full !	The record already is full. (After swipe card)	Download Record and Erase Record
Check FLASH !	The record can’ t write into the FLASH memory. (After swipe card)	Connect Agent
Decode Error !	Swipe Card can’ t decode. (After swipe card)	Swipe Card again or Change Card
No Record !	No Record in FLASH memory. (Enter Database -View function)	Swipe Card
Recode not empty !	The FLASH memory not empty. (Enter Calendar function)	Download Record and Erase Record
ISP MODE	Enter FMM Mode (By communication command)	Update New Firmware

LED Indicator

Status	Green LED	Red LED	Buzzer	Read Card
Power On	**Take turns blink 2 times**		**Beep. Beep.**	**X**
Auto Power Off	**Take turns blink 2 times**		**Beep. Beep.**	**X**
Ready	**Off**	**Off**	**X**	**O**
Read OK	**Blink 1 times**	**Off**	**Beep.**	**X**
Read Error	**Off**	**Blink 1 times**	**Beep. Beep. Beep.**	**X**
Firmware Management mode	**Off**	**On**	**X**	**X**

■ Operational Description

1. Powered by Battery

For normal use, the unit is powered by battery. Push the Power Switch Button "⊙" for about 2 seconds to turn on the unit. Also push the Power Switch Button "⊙" for about 2 seconds to turn off the unit at Switch Mode. After the unit is turned on, the power would be turned off automatically if there is no swiping a card on the unit in 30 seconds (default) at Auto Power Off Mode. This means the unit would be turned off if no swiping a card again in every 30 seconds (default) after every card swiping. It would have Low Battery Detect/Warning indication when the unit is powered by battery.

2. Powered by Cable

When MSR120 is connected/disconnected to external power adapter by the WAS-T0017 RS232 cable or USB port by the WAS-T0233 USB cable,, it would be turned On/Off automatically. When the unit is connected with the PC through the communication Cable (WAS-T0017 or WAS-T0233) and the PC is running MSR120 software and then the unit will be turned on. Then you can do the unit Setting, Configuration or data downloading. When powered by cable from PC, the Power Switch "⊙" would have no function and the unit would have no Low Battery Detect/Warning function.

3. Real Time Clock Setting

Before start using the unit, you must set the Real Time Clock (RTC) inside the unit to your local time. If there is no battery for quite a while or it is powered by cable for quite a while this would cause Real Time clock (RTC) malfunctioned due to no power supply. When put on the battery to turn on the unit and the Red/Green LED take turns blinking, this means the RTC is malfunctioning and you must do the RTC time setting before you use the unit.

4. Low Battery Detect

When powered by battery, it would have Low Battery Detect function. When the battery goes low, the LCD would display "▭" and you must change battery immediately, otherwise, the unit would shut down any time without pre-warning.

5. Swipe Card

When MSR120 is showing the status of any function on the screen, after swiping magnetic card to MSR120 reader, MSR120 is display magnetic card ID and record(s) information on the screen immediately. When MSR120 in not work for next magnetic card swipe, MSR120 reader will back to default screen automatically.

6. Operate for Calendar

Before setting calendar function, please delete remaining records from MSR120 reader, if there are records in the memory of MSR120, your operate setting for Calendar, MSR120 reader will display " Record no empty" on the screen.

7. Memory Full Warning

Log database memory is full. You not be able to add any new records. Free the log database memory by uploading the data to the PC.

8. Communication by WAS-T0017

You must use external power when the PC connect to MSR120 by WAS-T0017 cable, or else the communication is not action. You should be press any key on MSR120 until the communication is finished, if you don't use external power.

9. Firmware Management mode (FMM)

FMM allows you to quickly upgrade your MSR120's internal firmware via com port and also check validity of currently loaded firmware. Contact your dealer for most recent firmware upgrade files.

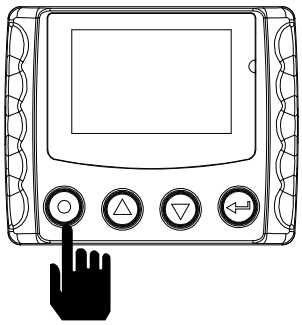
10. Database in memory

The MSR120 allows you to manage database by software . The Logical Erase Database will logic clean the database. The Physical Erase Database will physical clean the database and it's can't recover the database. The Recovery Database will recover the previous erase and not yet covered database. The record pointer has retune to the top of the database after any erase.

■ Replace Battery

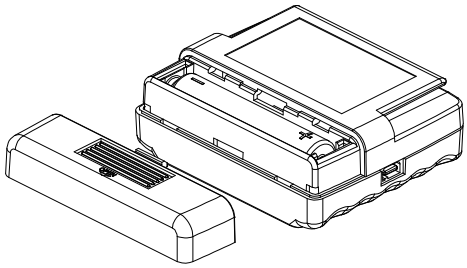
Note:

1. Read the instructions on your device before replace new battery.
2. MSR120 can used Single-cell alkaline, nickel-cadmium (NiCd), or nickel-metal hydride (NiMH) Battery

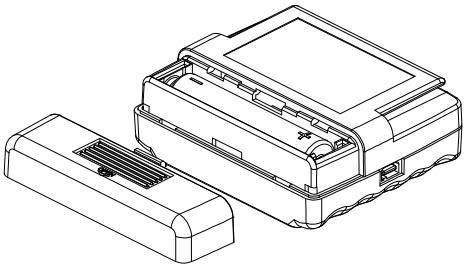


1. Power turn off

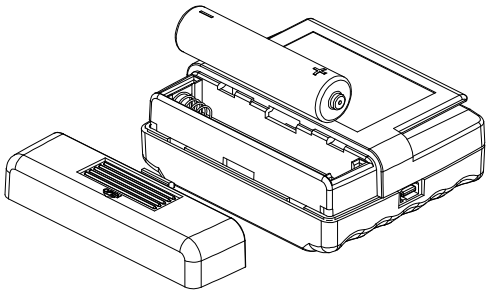
4. Take new battery



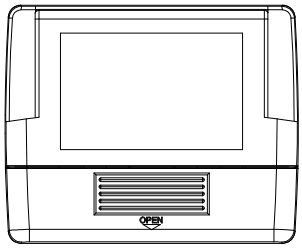
2. Take the cover away



5. Put new battery in



3. Take the battery away



6. Fix the battery cover

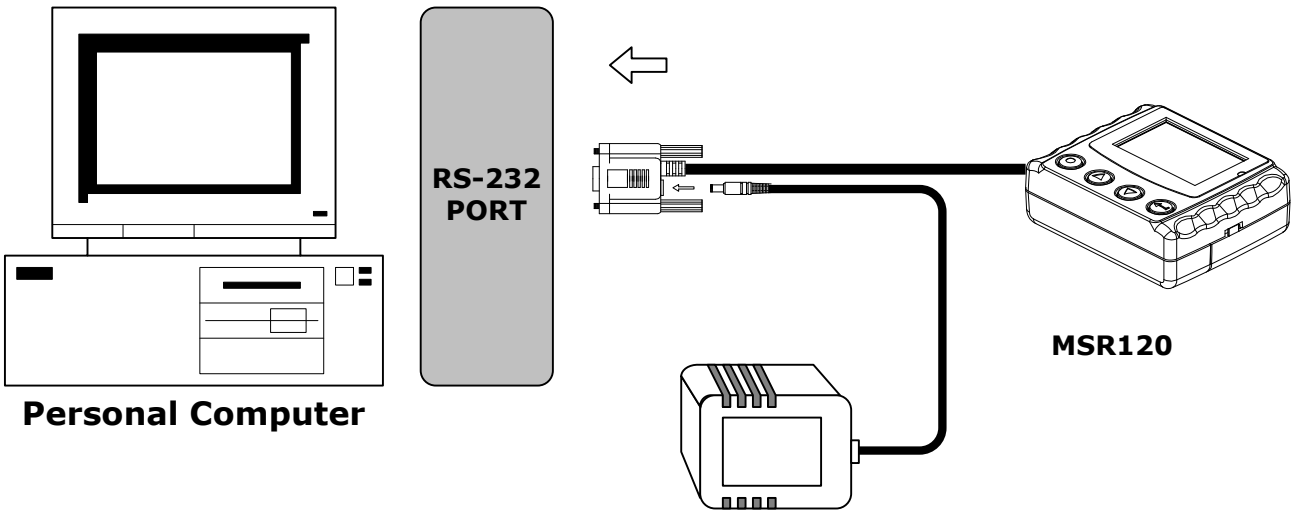
Connections

WAS-T0017

DSUB 9P POWER JACK	DSUB 9P FEMALE PIN	FUNCTION	MINI USB 4P
+		VCC	1
	2	TXD	2
	3	RXD	3
-	5	GND	4

No use

Connect to PC



Note:

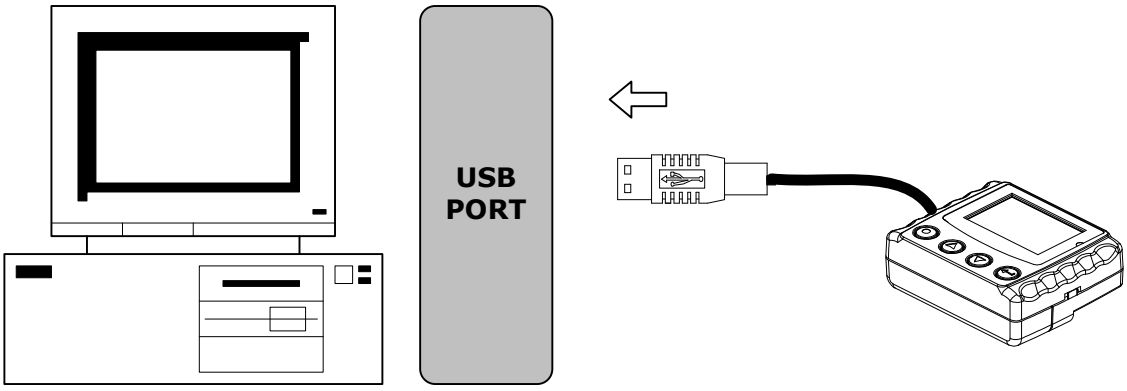
1. When MSR120 is connected/disconnected with external power adapter, it would be turned On/Off automatically.
2. When MSR120 is not connected with external power adaptor , the corresponding key for power on MSR120 needs to be pressed all the time during the communications with the PC.

WAS-T0233

USB 4P FEMALE PIN	FUNCTION
1	VCC
3	D -
2	D +
4	GND

MINI USB 4P	FUNCTION
1	VCC
2	RXD
3	TXD
4	GND

Connect to PC



Note:
1. When MSR120 is connected/disconnected with USB port, it would be turned On/Off automatically.

Card Data Format

CARD DATA STRING

TRACK 1	TRACK 2	TRACK 3	DATE & TIME & WEEK

M1	SS	*TRACK1 DATA*	ES	M2	SS	*TRACK2 DATA*	ES	M3	SS	*TRACK3 DATA*	ES	M4	DATE	SP	TIME	SP	WEEK
01	%	*TRACK1 DATA*	?	02	;	*TRACK2 DATA*	?	03	+	*TRACK3 DATA*	?	FE	DATE		TIME		WEEK

TRACK 1

01h	%	CARD ID	?

1. 01h is the physical track 1
2. SS is the start sentinel (%).
3. ES is the end sentinel (?).
4. Card Id up to 76 alphanumeric data characters.

Track 1 IATA	
Bits Per Inch	210
Bits Per Character	7
Alphanumeric Characters	79

TRACK 2

02h	;	CARD ID	?

1. 02h is the physical track 2
2. SS is the start sentinel (;).
3. ES is the end sentinel (?).
4. Card Id up to 37 numeric data characters.

Track 2 ABA	
Bits Per Inch	75
Bits Per Character	5
Numeric Characters	40

TRACK 3

03h	+	CARD ID	?

1. 03h is the physical track 3
2. SS is the start sentinel (+).
3. ES is the end sentinel (?).
4. Card Id up to 104 numeric data characters.

Track 3 Thrift	
Bits Per Inch	210
Bits Per Character	5
Numeric Characters	107

DATE&TIME&WEEK

M4	DATE	SP	TIME	SP	WEEK
FEh	YYYY/MM/DD	SP	HH:MM:SS	SP	W
FEh	MM/DD/YYYY	SP	HH:MM:SS	SP	W
FEh	DD/MM/YYYY	SP	HH:MM:SS	SP	W

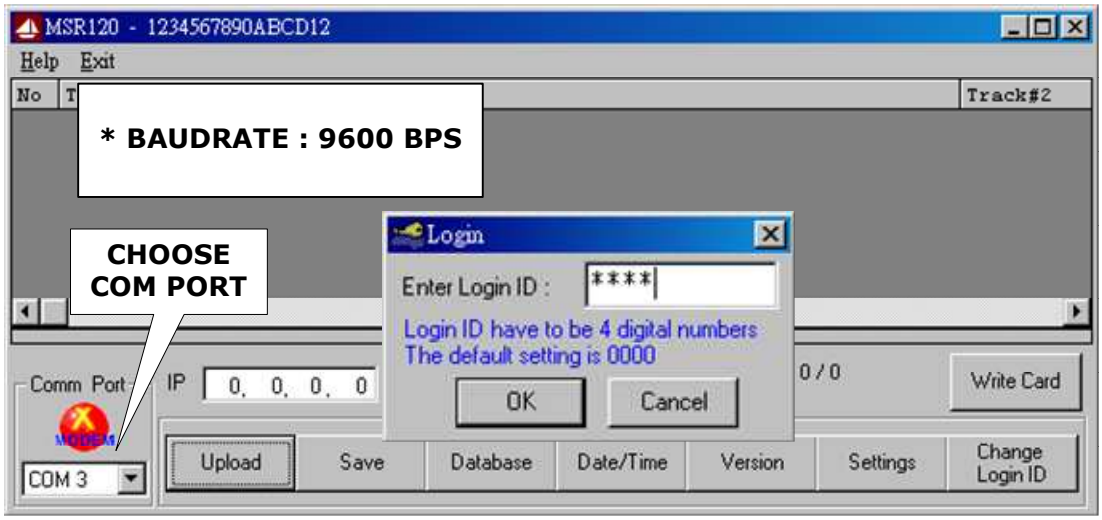
1. FEh is the Separate Character.
2. Date have 3 formats - YYYY/MM/DD, MM/DD/YYYY, DD/MM/YYYY
3. SP is the SPACE characters (20h).
4. TIME is 24hr .

WEEK	
SUN	0
MON	1
TUE	2
WED	3
THU	4
FRI	5
SAT	6

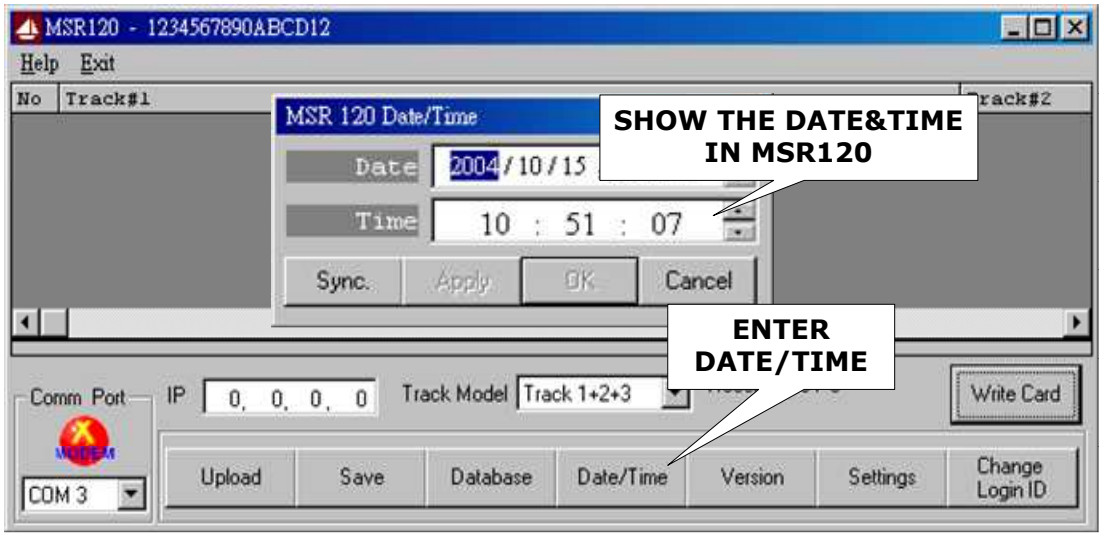
Demo Software

STEP 1 : RUN MSR120 DEMO

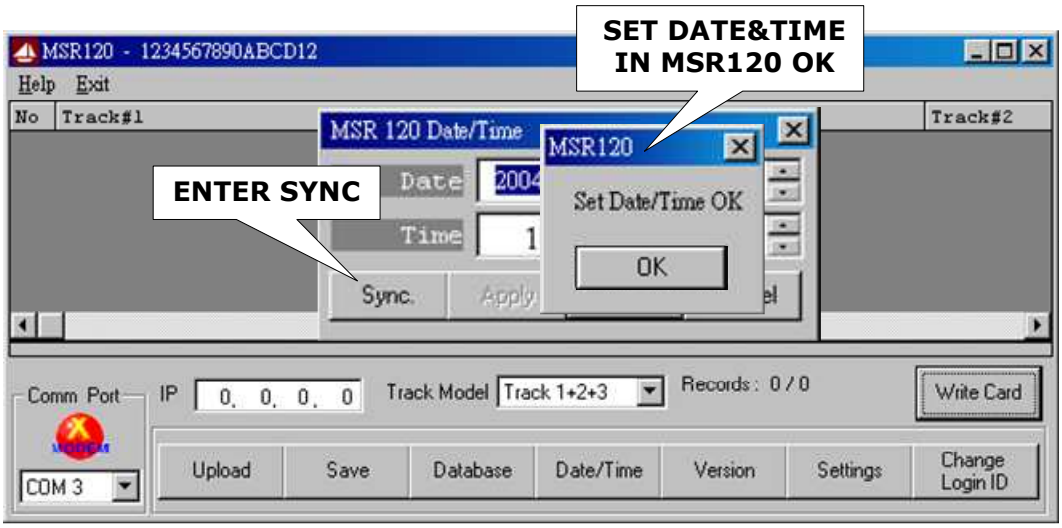
STEP 2 : CHOOSE COM PORT (Do not choose TCP/IP)



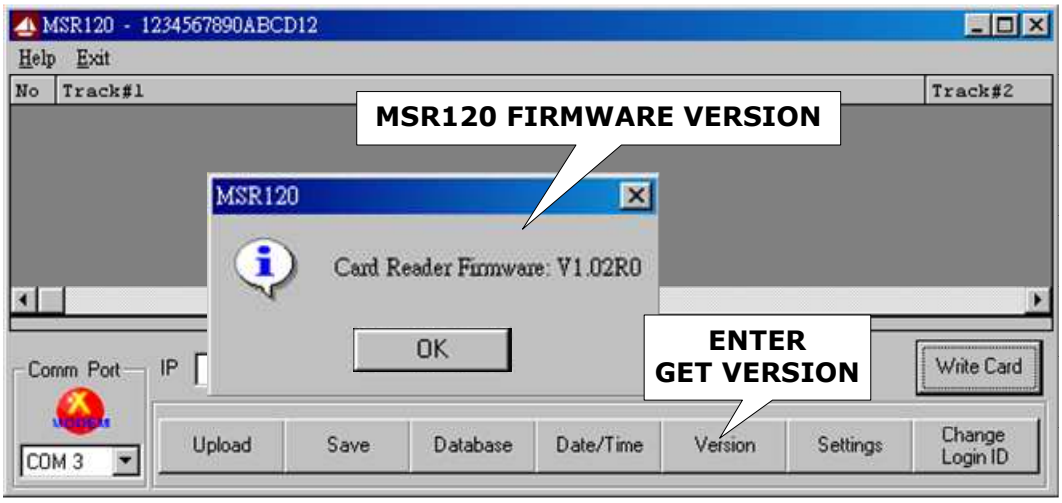
STEP 3 :ENTER DATE/TIME TO GET DATE/TIME
(TO SHOW THE DATE&TIME IN MSR120 WHEN NEEDED)



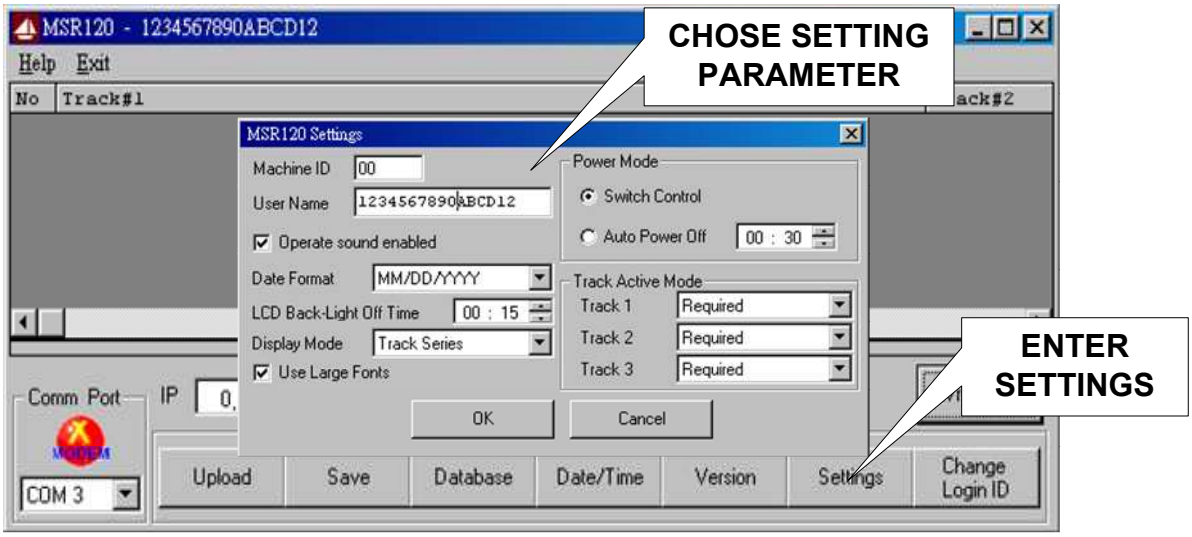
STEP 4 : ENTER DATE/TIME TO SET DATE/TIME (WHEN NEEDED)
NOTE: MAKE SURE YOUR PC CURRENT TIME IS CORRECT BEFOR YOU SET PC TIME TO MSR120.



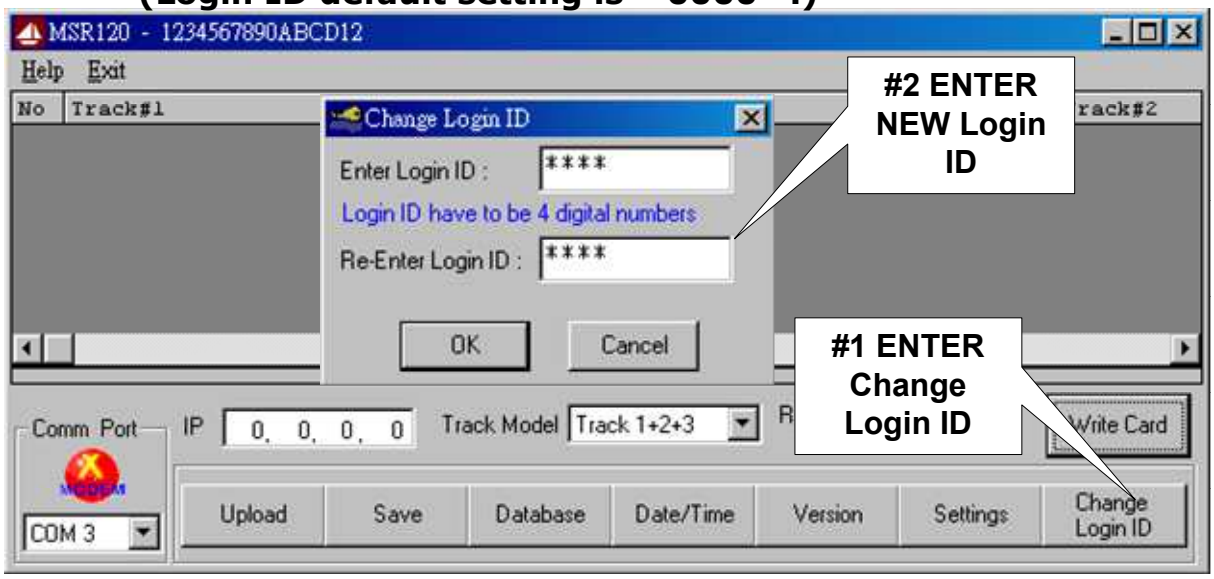
STEP 5 : ENTER GET VERSION
(TO SHOW MSR120 FIRMWARE VERSON WHEN NEEDED)



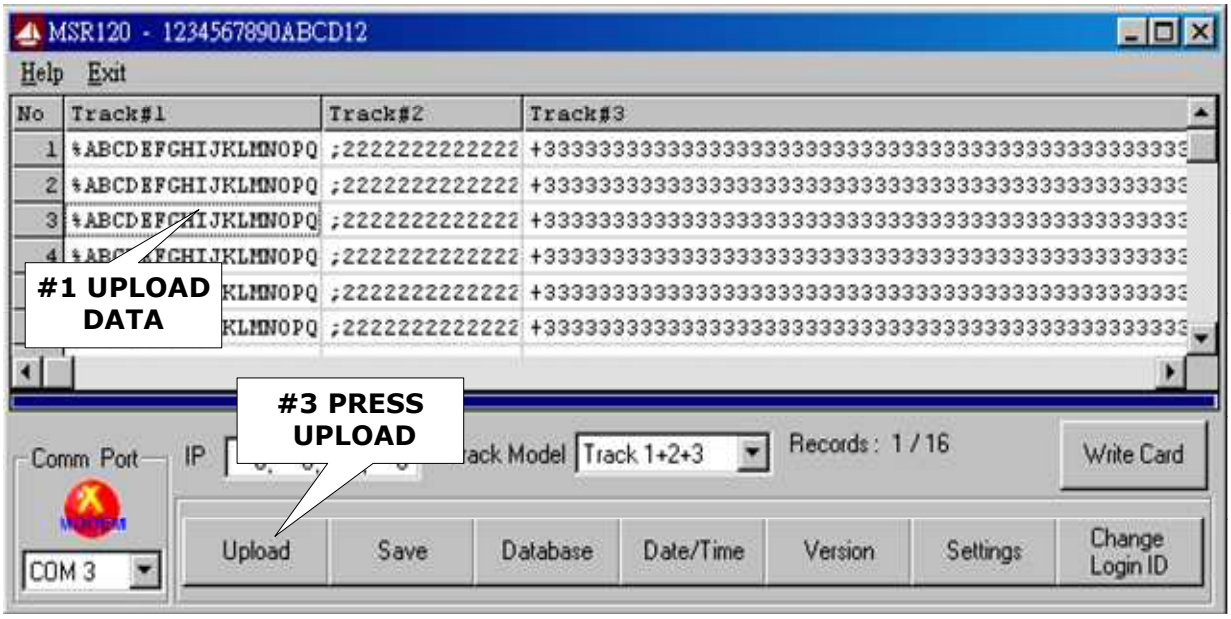
STEP 6 : ENTER SETTING MSR120 PARAMETER.



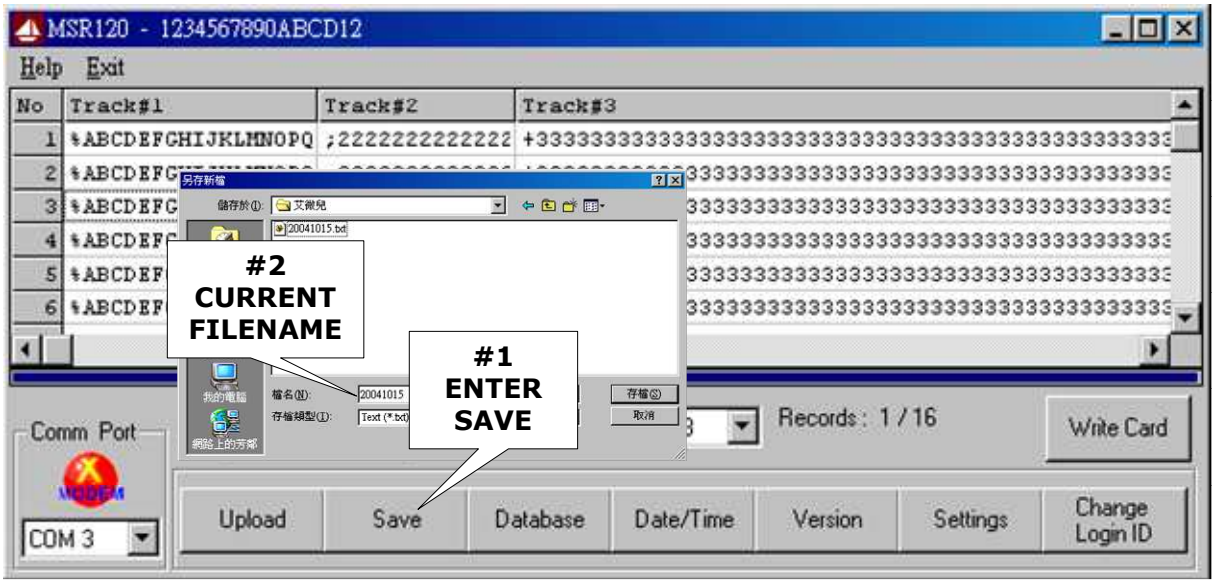
STEP 7 : ENTER Change Login ID TO Change Login ID
(Login ID default setting is "0000" .)



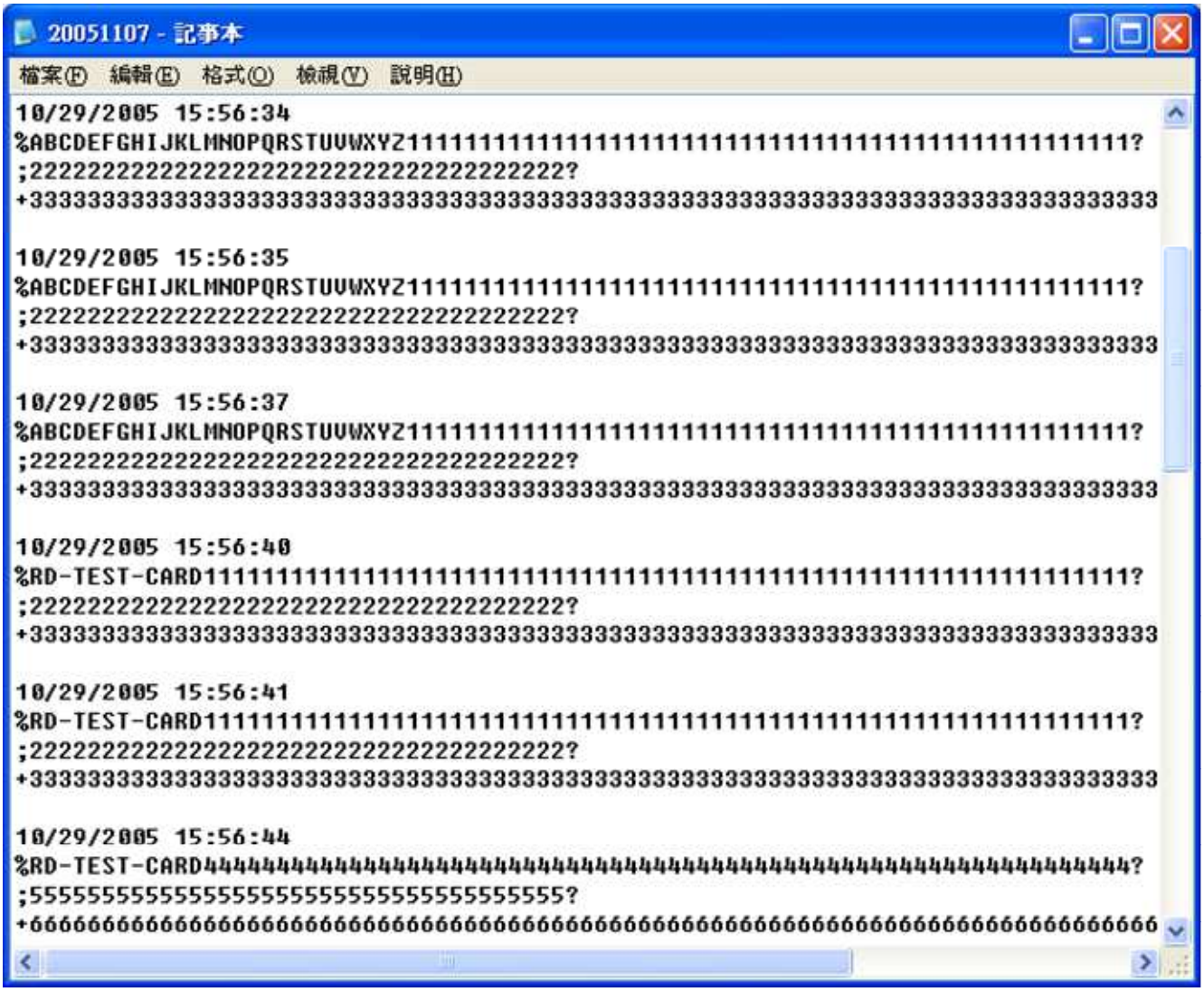
STEP 8 : ENTER UPLOAD TO UPLOAD DATA



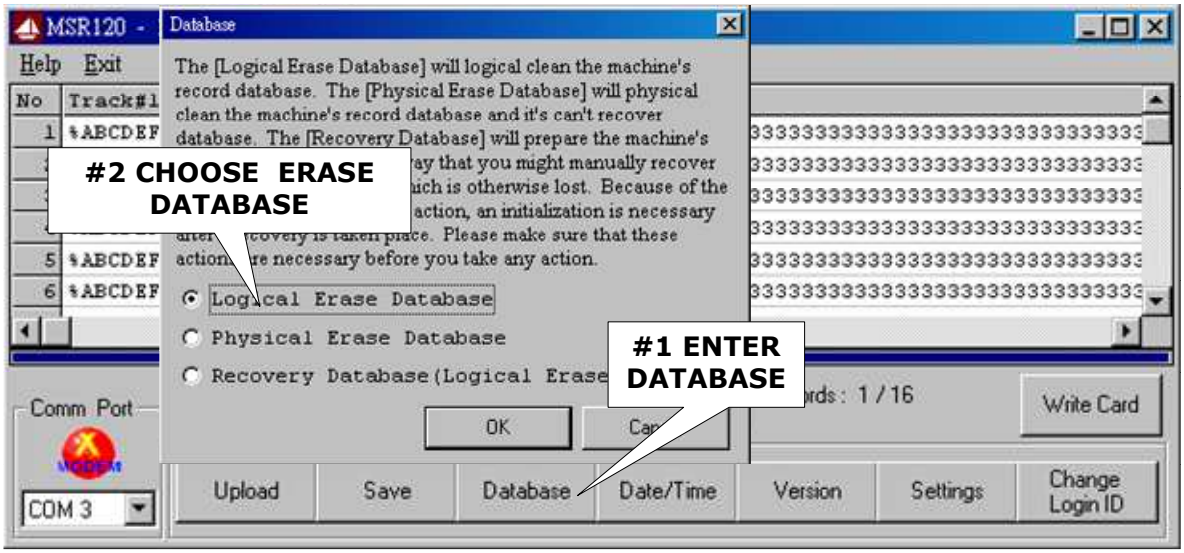
STEP 9 : ENTER SAVE TO SAVE DATA



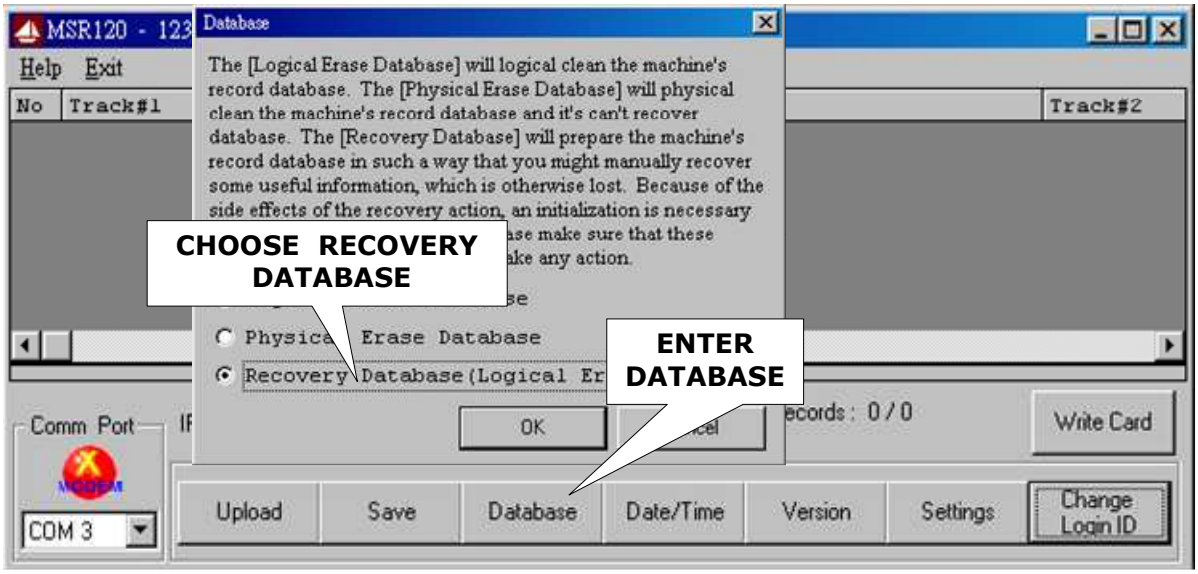
SAVE DATA TEXT FILE



STEP 10 : ENTER Database to erase the memory records of MSR120
(Note : Always [Save] the data before [Erase])



STEP 11 : ENTER Database to recovery the memory records of MSR120
(Note : Database must empty)



STEP 12 : EXIT MSR120 SOFTWARE

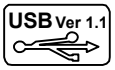
Specifications

Magnetic Stripe Card

TRACK 1 / IATA / 210 bpi / 79 Alphanumeric Characters
TRACK 2 / ABA / 75 bpi / 40 Numeric Characters
TRACK 3 / Thrift / 210 bpi / 107 Numeric Characters

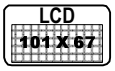
RS232 Interface

RS232 , Half-Duplex , 8N1 , 9600 bps



USB Interface

Full compliance with the USB Specification V 1.1
The device uses a Virtual Serial Port Driver, making it appear to have the software like a standard RS232 Serial Port.



LCD Display

LCD type : FSTN
Dot arrangement :101 x 67 Dots Matrix LCD Module
Viewing direction : 6 O'clock

Communication Protocol :

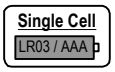
Version 1.2 (GNET V1.2)

CLOCK

Real Time Clock (RTC) module and back-up capacitor

Memory Size for Storing Data

CMOS Serial Flash Memory 512K bytes
Up to 2048 records (256 Bytes / Record)

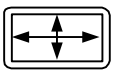


Battery Power

Single-cell alkaline, nickel-cadmium (NiCd), or nickel-metal hydride (NiMH) battery .

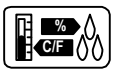
Power Supply from Cable

DC 5V , 200mA (for RS-232) or USB Powered



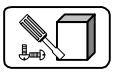
Dimensions

L 58 x W 20 x H 47 mm



Environment

Operating Temp : -0 ~ +55℃
Storage Temp : -10 ~ +60℃
Humidity : 10 ~ 90 % relative



Mounting

Portable or Any surface

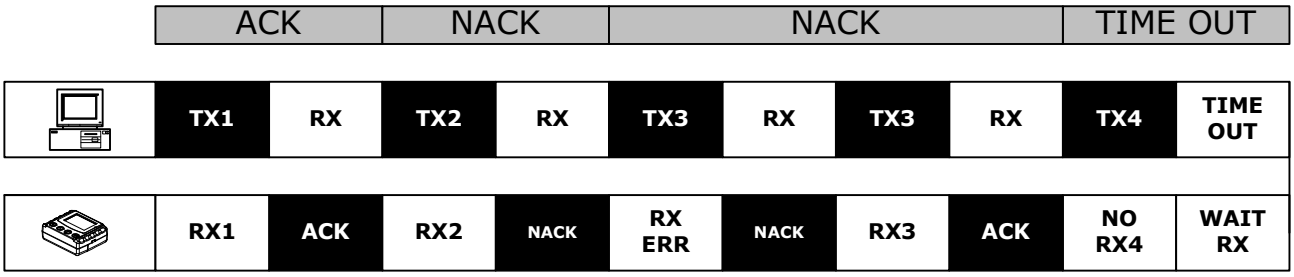
Communication Protocol

GNET FEATURES

- Support TTY (TELE TYPE) OPERATION -
  Use TTY to send commands and messages.
- Simple handshaking -
  One enquiry one answer back.
- Multi-link capability
- Expandability -
  GNET provides 4 major functions:
  1. POLLING
  2. LOGIN / LOGOUT
  3. DATABASE
  4. INFORMATION

  Also can be expandable.
- Simple format
  Use ASCII value for each field and use Separator "," between two Fields.

GNET Handshaking



GNET PACKET

ITEM	Dec	Hex	Control Key	Function
STX	2	02	^B	Start of Text
CMD	Ascii	Ascii	Ascii	Command Code
CONTENTS	Ascii	Ascii	Ascii	Contents Data
CHKSUM	Ascii	Ascii	Ascii	Check Sum
CR	13	0d	^M	Carriage Return
REPLY	(78) 65	(4e) 41	(N) A	(Negative) Acknowledge

Command Index Table

Topic	Command	Contents	Description
SETTING	L	4 Characters for Login(0000)	Login
	O	-	Logout
	P	New four digit password	Set Password
	X	-	Enter Firmware Management Mode
	B	-	Get Register
	C	-	Set register
	F	-	Get Product Version
	S	Date,Time,Week	Set Date,Time and Week
	T	-	Get Date and Time
DATABASE	N	-	Get Number of Record
	G	Number	Read Record by Number
	E	-	Erase All Record (Logical)
	ER	-	Erase All Record (Physical)
	M	-	Recovery All Record

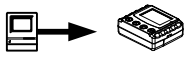
Reply Index Table

Topic	Reply	Contents	Description
ACK	A	Reply Information	ACK+Information
NAK	N	See Error Index Table	NAK+Information

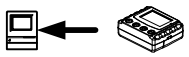
Error Index Table (For Reply NAK)

Topic	Error Index	Description
ACCESS LEVEL	00	Access Denied or Password Error
COMMAND CODE	01	Command packet is too long
	02	Command packet is empty
	03	Command code is out of range
	04	Illegal Command or Data
DATABASE	05	Database and Register is Empty
	06	Record number is out of range
	07	Check Sum Error
	08	Memory Not Enough
	09	Action Failure
FILE	0A	File Not Exist

1. GET NUMBER OF RECORD :



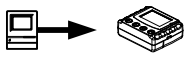
STX	N	CR



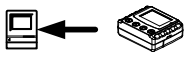
STX	A	NUMBER	CHKSUM	CR

NUMBER	Record Count . 4 Bytes Width (0000h ~ 0800h)

EXAMPLE



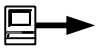
02	N	0d



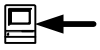
02	A	000C	14	0d

The Total of Record Count : 12

2. READ RECORD BY NUMBER :



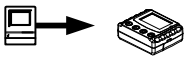
STX	G	NUMBER	CR



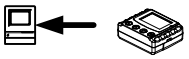
STX	A	NUMBER	,	DATA	DATE TIME WEEK	CHKSUM	CR

NUMBER	Record Count . 4 Bytes Width (0000h ~ 07FFh)
DATA	Record Data (01h+TRACK1 , 02h+TRACK2 , 03h+TRACK3)
DATA TIME WEEK	FEh+DATE+20h+TIME+20h+WEEK

EXAMPLE



02	G	0002	0d



02	A	0002	,	01	%	ABCDEF	?	02	;	123456	?	03	+	654321	?

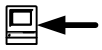
FE	11/10/2004		10:39:23		3	7A	0d

Read Record Number : 12
TRACK1 ID : ABCD , TRACK2 ID : 2222 , TRACK3 ID : 3333

3. ERASE ALL RECORD : (Logical Erase)

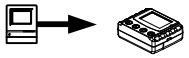
STX	E	CR

*** (Erase Duration : < 60 second)**

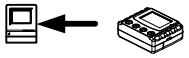


STX	A	CR

EXAMPLE



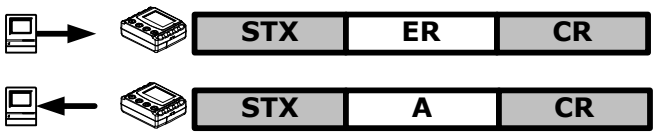
02	E	0d



02	A	0d

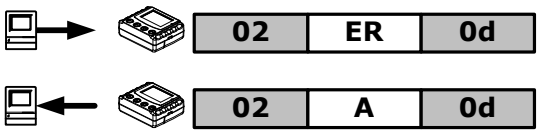
ERASE ALL RECORD

4. ERASE ALL RECORD : (Physical Erase)



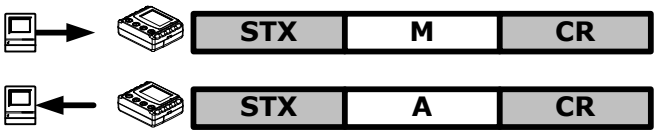
*** (Erase Duration : < 3 second)**

EXAMPLE



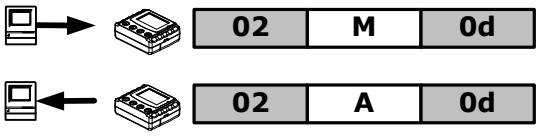
Erase all record (Can't use the "M" command to recover)

5. RECOVER ALL RECORD :



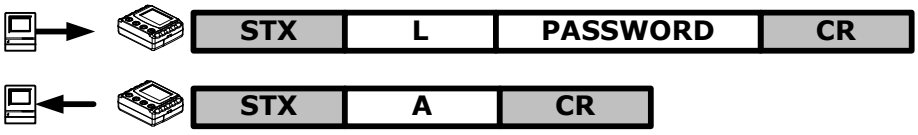
*** (Recover Duration : < 60 second)**

EXAMPLE



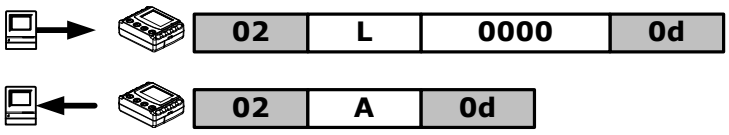
Recover all record

6. LOGIN :



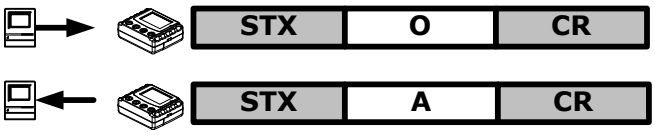
PASSWORD	4 Characters for Login. 0000=Initial value

EXAMPLE

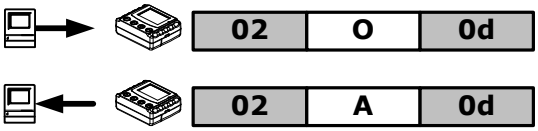


Login password : 0000

7. LOGOUT :

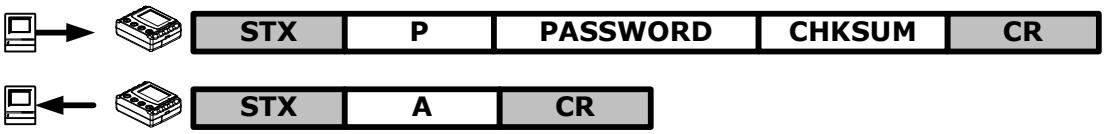


EXAMPLE



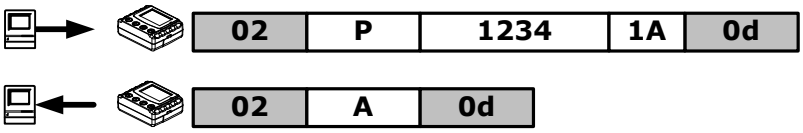
Logout

8. SET PASSWORD :



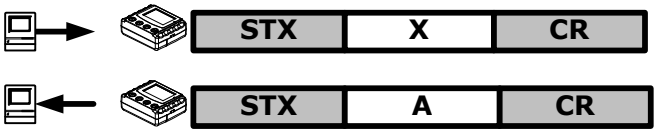
PASSWORD	New four digit password

EXAMPLE

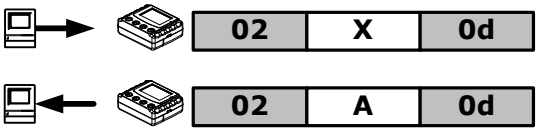


Set new password : 1234

9. ENTER FIRMWARE MANAGEMENT MODE :

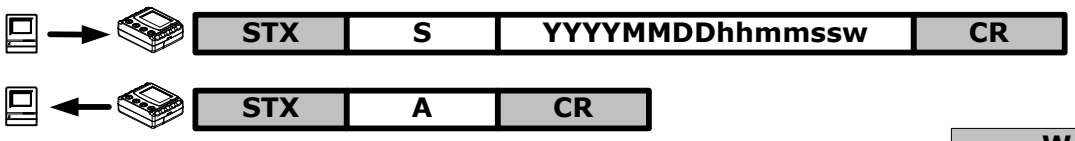


EXAMPLE



Enter firmware management mode

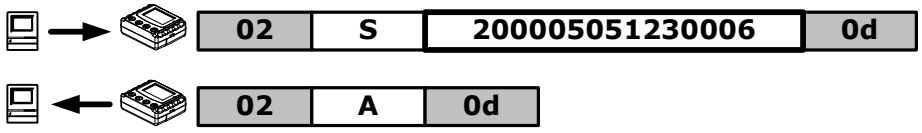
10. SET DATE AND TIME :



YYYY	Year (2000 - 20xx)
MM	Month (01 - 12)
DD	Date (01 - 31)
hh	Hour (00 - 23)
mm	Mintue (00 - 59)
ss	Second (00 - 59)
W	Week (0 - 6)

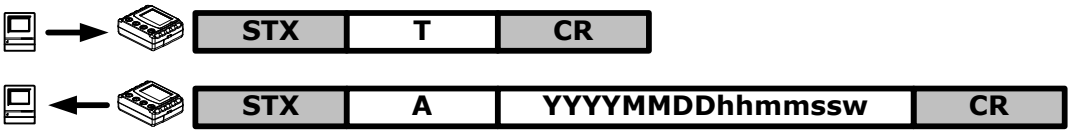
Week	
SUN	0
MON	1
TUE	2
WED	3
THU	4
FRI	5
SAT	6

EXAMPLE

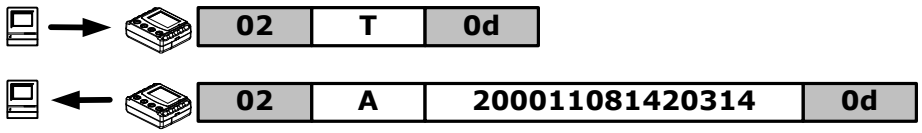


Set Date = 2000 / 5 / 5
Set Time = 12 : 30 : 00 , Saturday

11. GET DATE AND TIME:

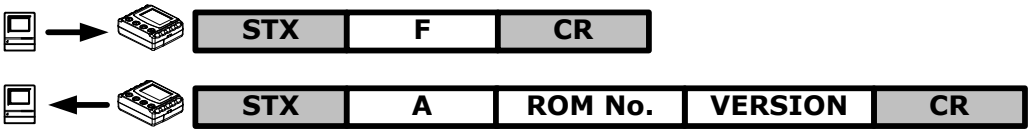


EXAMPLE



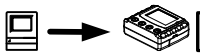
Get Date : 2000 / 11 / 8
Get Time : 14 : 20 : 31 , Thursday

12. GET PRODUCT VERSION :

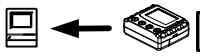


ROM No.	ROM-Txxxx , xxxx : Rom serial number
VERSION	Vx.xxRm , Vx.xx : Firmware version x.xx , Rm : Modify m times

EXAMPLE



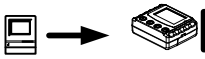
02	F	0d



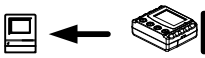
02	A	ROM-T0571	,	V1.03R0	0d

ROM serial number = ROM-T0571
Firmware Version = 1.03
Modify times = 0

7. SET REGISTER :



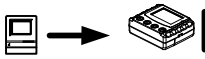
STX	C	REGISTER	,	PARAM	CHKSUM	CR



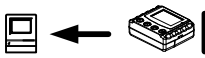
STX	A	CR

REGISTER	Register Address . 2 Bytes Width (00h ~ FFh)
PARAM	Set Parameters of Register
CHKSUM	C + REGISTER + , + PARAM

8. GET REGISTER :



STX	B	REGSTER	CR



STX	A	PARAM	CHKSUM	CR

REGSTER	Register Address . 2 Bytes Width (00h ~ FFh)
PARAM	Set Parameters of Register

REGISTER TABLE

Register	Function	Description
10h	Auto Off Duration(Low byte)	00~FFh (0~ 255 second)
11h	Auto Off Duration(High byte)	-
12h	Power Mode	00h: Auto Power Off FFh: Switch Other: Real time
13h	Machine ID (High byte)	2 Characters
14h	Machine ID (Low byte)	
15h	RTC cal. value	00 ~ FFh
16h	*	*
17h	*	
18h	Back Light Duration	00~FFh (0~ 255 second)
19h	Buzzer	00h: Off FFh: On
1Ah	Date Format	00h: mm/dd/yyyy FFh: yyyy/mm/dd other: dd/mm/yyyy
1Bh	Display Mode	00h: Tracks Parallel 01h: Credit Card Mode other: Tracks Series
1C~1Fh	*	*
20~2Fh	User Name	16 Characters
30h	Track 1 Active Mode	00h: Disable 01h: Required FFh: Enable
31h	Track 2 Active Mode	
32h	Track 3 Active Mode	
33~1FBh	*	*
1FC~1FFh	Password	4 Characters