

CASIO
DT-X30 Series
Hardware Manual
(Version 1.02)

CASIO Computer Co., Ltd.
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May 2009

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1. Overview of the Products

1.1 Features at a Glance

The DT-X30 series handheld terminal has been designed using the new concept of the Human-centered Design Process and is capable of performing various powerful functions including;

Outstanding development environment

- Windows® CE 6.0 English Version as the integrated OS (model dependant. See Chapter 1.2.)
- Microsoft® Windows Mobile® 6.1 English Version as the integrated OS (model dependant. See Chapter 1.2.)
- Visual Studio 2005
- Visual Studio 2008

CPU, Memory

- High-performance CPU
Marvell® PXA320 Application Processor (runs at 624 MHz, maximum)
- Large-capacity memory
RAM : 128 MB
F-ROM : 128 MB (User area; approximately 60 MB)

Capability of scanning industrial standard bar code symbologies

- 1D symbologies (with Laser Scanner models. See Chapter 1.2.)
UPC-A, UPC-E, EAN8, EAN13, Codabar, Code39, Code93, Code128, ITF, MSI, Industrial 2of5, IATA, GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded, GS1 DataBar Stacked, GS1 DataBar Expanded Stacked
- 1D symbologies (with C-MOS Imager models. See Chapter 1.2.)
UPC-A, UPC-E, EAN8, EAN13, Codabar, Code11, Code39, Code93, Code128, ITF, MSI, Industrial 2of5, IATA, GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded
- 2D symbologies (with C-MOS Imager models. See Chapter 1.2.)
PDF417, Micro PDF, Code49, Composite, Codablock F, TLC39, GS1 DataBar Stacked, GS1 DataBar Omnidirectionalstacked, GS1 DataBar Expanded Stacked

Capturing images

- Integrated digital camera (2.0 Mega pixels, Auto focus)

Compatibility of various communication systems

- Integrated Wireless WAN module compatible with GSM, GPRS, and EGPRS (EDGE)
- Integrated WLAN module compatible with IEEE802.11b/g standard
- Integrated GPS module
- Bluetooth® Version 2.0 + EDR
- IrDA Version 1.3 for high speed infrared communication
- USB version 1.1 (Host/Client) for serial interface

High expandability

- microSD (SDHC) card slot

Improved environment durability

- Impact resistance : 1.5 m in height*
- Dust/Water-splash proof : IP64 level (compliant with IEC60529 International Standard)

* ; The drop durability height is a measured value resulting from actual testing. It does not necessarily guarantee the product from damage.

1.2 Available Models

Table 1.1 List of available models

Model no.	OS (Note 1)	Scan Engine	WLAN (802.11 b/g)	WWAN (GSM, GPRS, EGPRS/EDGE), GPS	Bluetooth	Camera
DT-X30R-10	CE	Laser	Yes	No	Yes	No
DT-X30G-10-CN	CE	Laser	No	Yes	Yes	No
DT-X30GR-10	CE	Laser	Yes	Yes	Yes	No
DT-X30R-30	CE	Imager	Yes	No	Yes	No
DT-X30R-30-CN	CE	Imager	Yes	No	Yes	No
DT-X30GR-30	CE	Imager	Yes	Yes	Yes	No
DT-X30GR-30-CN	CE	Imager	Yes	Yes	Yes	No
DT-X30GR-30C	CE	Imager	Yes	Yes	Yes	Yes
DT-X30GR-30C-CN	CE	Imager	Yes	Yes	Yes	Yes
DT-X30R-15	Mobile	Laser	Yes	No	Yes	No
DT-X30GR-15	Mobile	Laser	Yes	Yes	Yes	No
DT-X30GR-15C	Mobile	Laser	Yes	Yes	Yes	Yes
DT-X30R-35	Mobile	Imager	Yes	No	Yes	No
DT-X30GR-35	Mobile	Imager	Yes	Yes	Yes	No
DT-X30GR-35C	Mobile	Imager	Yes	Yes	Yes	Yes
DT-X30G-35U	Mobile	Imager	No	Yes	Yes	No
DT-X30G-35UC	Mobile	Imager	No	Yes	Yes	Yes

Notes:

1. “CE” denotes that the model integrates Windows CE 6.0 English Version for its operating system, and “Mobile” denotes that the model integrates Windows Mobile 6.1 English Version for its operating system.
2. “-CN” in the “Model no.” box denotes that the model is dedicated for China only.
3. The table shows all the models available current as of May 2009.

Table 1.2 List of options

Option	Product	Model no.	Remark
Cradle	USB Cradle	HA-G60IO	
		HA-G60IO-CN	
	Ethernet Cradle	HA-G62IO	
		HA-G62IO-CN	
Battery	Battery Pack	HA-G20BAT	
		HA-G20BAT-CN	
Battery charger	Dual Battery Charger	HA-G32DCHG	
		HA-G32DCHG-CN	
	Cradle-type Battery Charger	HA-G30CHG	
		HA-G30CHG-CN	
	Car Mounted-type Battery Charger	HA-G35CHG	
		HA-G35CHG-CN	

Continue.

AC adaptor		AD-S42120B	- For HA-G60IO, HA-G62IO, HA-G30CHG, HA-G32DCHG
		AD-S42120B-CN	
Power Cable for AD-S42120B		AC-CORD-EU	- For Europe
		AC-CORD-US	- For USA/Canada
		AC-CORD-TW	- For Taiwan
		AC-CORD-KR	- For Korea
		AC-CORD-AU	- For Australia/New Zealand
Cable	USB cable	DT-380USB	- For between cradle and PC
Others	Screen Protect Sheet	HA-G90PS5	

Note:

“-CN” in the “Model no.” box denotes that the model is dedicated for China only.

1.3 Options and Interfaces

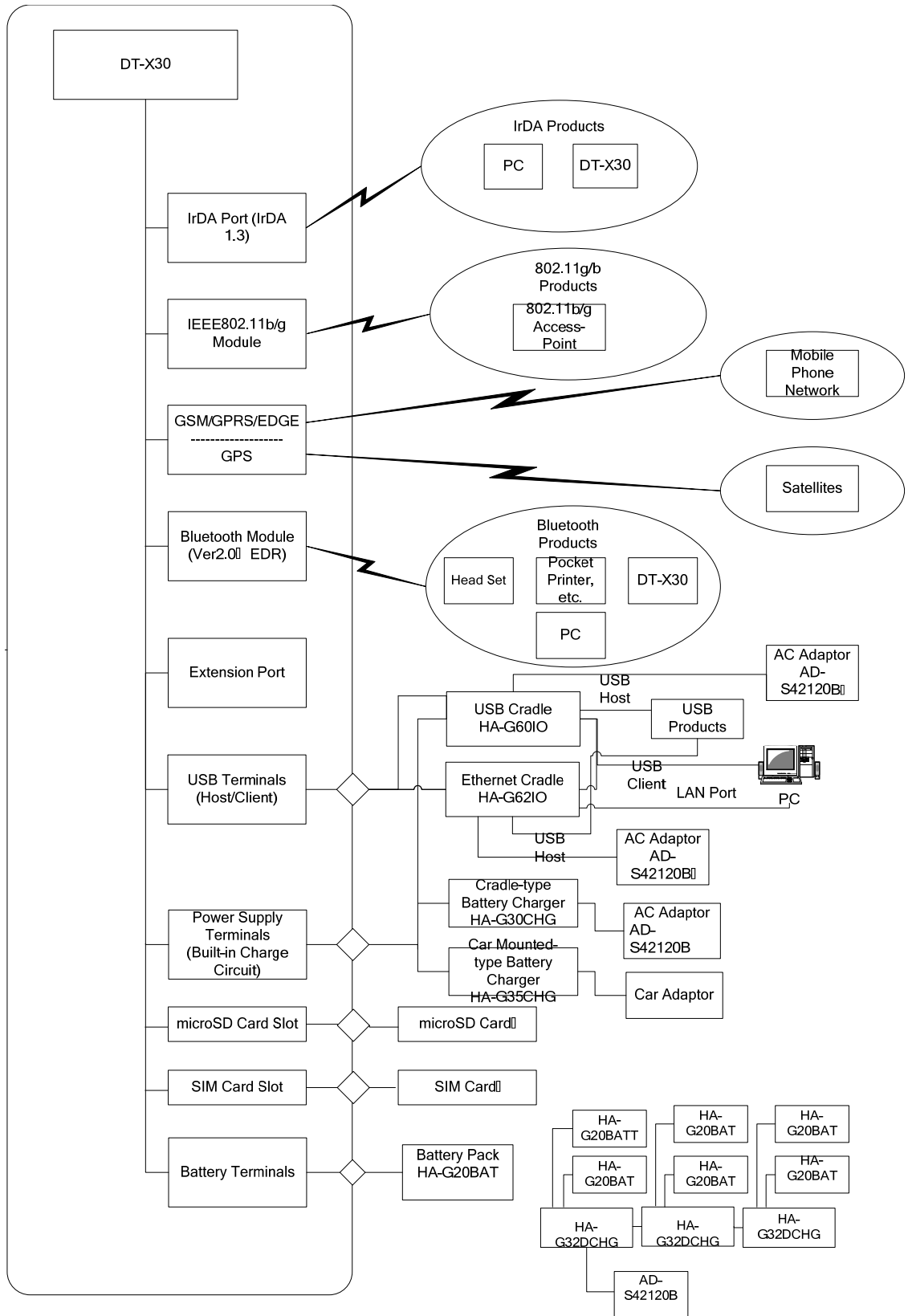


Figure 1.1

1.4 External Views

1.4.1 DT-X30

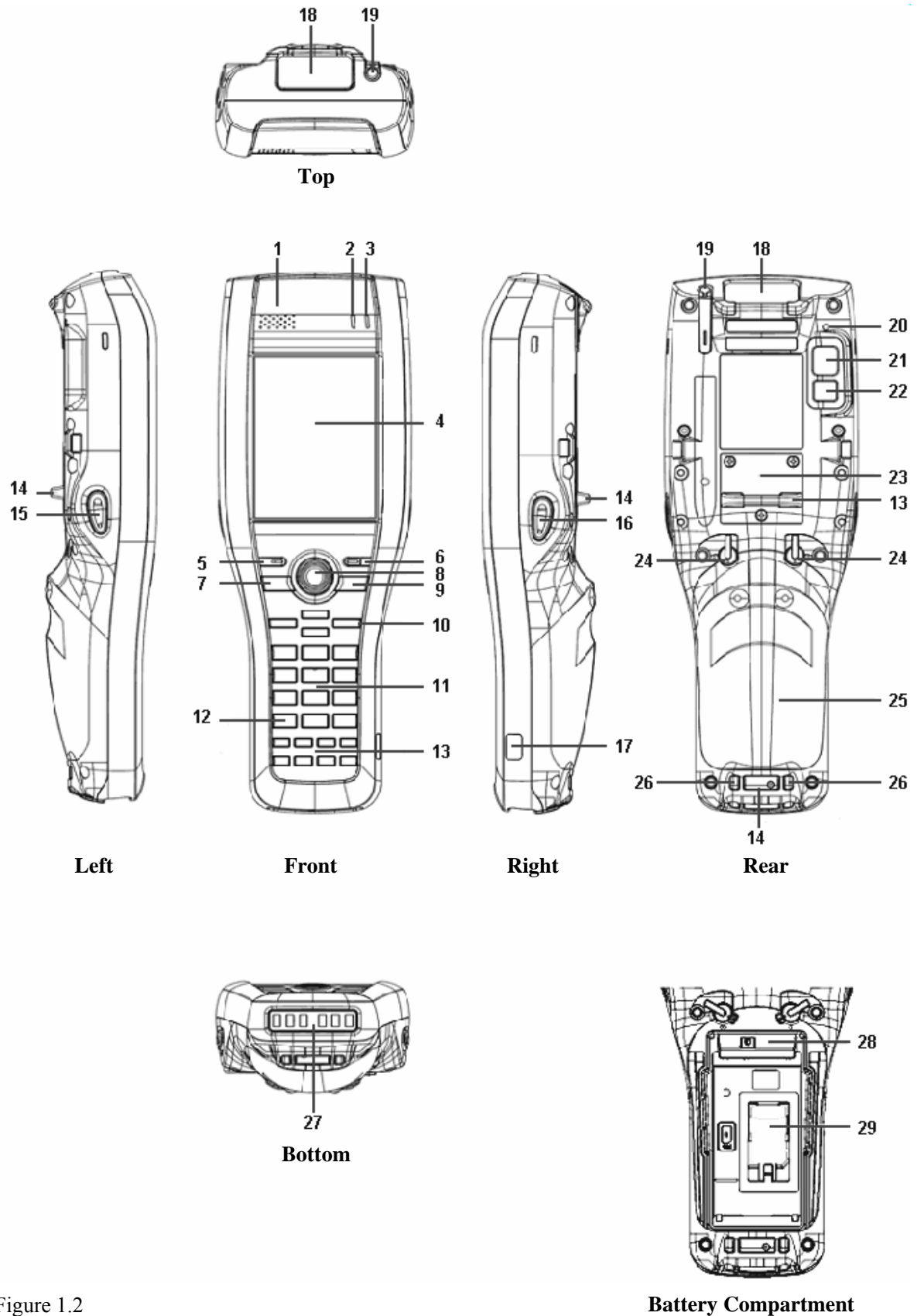


Figure 1.2

See the following table for the descriptions of each referenced part on the terminal.

Table 1.3

No.	Name	Description
1	Speaker	Buzzer and voice messages are output.
2	Indicator 1	Orange : Charging battery pack. Green : Charging battery pack is complete. Red : Battery pack is abnormal or the surrounding temperature is out of the charging temperature range.
3	Indicator 2	Flashes in blue when operating via Bluetooth or in orange when operating via WLAN, WWAN or GPS. Lights in green when reading a bar code successfully or in red when alarming (programmable).
4	Touch Screen	Displays text and operating instructions. Also used to operate the terminal and enter data using stylus provided.
5	Microphone	Used to input a sound including voice sound. See note.
6	Power Key	Turns on and off the power.
7	CLR Key	Used to clear one letter to the left of the input key.
8	Center Trigger Key	Used to perform bar code reading. Can be assigned an arbitrary function.
9	Execute Key	Press when finishing entering numerical values or when moving to the next step.
10	Cursor Keys	These keys operate much like PC's cursor keys.
11	Numeric Keys	Used to enter numeric, decimal points, and letters.
12	Fn Key	Used to make various settings in combination with the function keys or numeric keys or when starting a pre-registered application.
13	Function Keys (Windows CE models)	Various functions other than bar code reading can be assigned to these keys. The assignments by default on the keys are as follows. F1: Deletes the character on the left side of the cursor. F2: Not assigned F3: Not assigned F4: Inputs “-“ (minus). F5: Inputs a space. F6: Not assigned. F7: Not assigned. F8: Changes text input mode. The input mode navigates to Numeric → Uppercase letter → Lowercase letter.
	Function Keys (Windows Mobile models)	Various functions other than bar code reading can be assigned to these keys. The assignments by default on the keys are as follows. F1: Left soft key. F2: Right soft key. F3: Not assigned F4: Not assigned F5: Not assigned F6: Raises sound volume. F7: Lowers sound volume. F8: Not assigned. Fn+F8: Changes text input mode. The input mode navigates to Numeric → Uppercase letter → Lowercase letter.

14	Strap Holes	Used to attach the hand strap. Also used for the hand belt.
15	L Trigger Key	Used to perform bar code reading.
16	R Trigger Key	Used to perform bar code reading.
17	IR Port	Used for communication with another terminal.
18	Reader Port	Laser light (Laser scanner models) or LED light (C-MOS Imager models) is emitted from this port that reads bar codes.
19	Stylus Holder	Used to insert stylus.
20	Reset Switch	Used to reset the terminal.
21	Digital Camera	Used to capture photographs, images.
22	LED Light	Used to light up an object when capturing it with the digital camera.
23	Extension Port	Provided for connecting an external device.

24	Battery Pack Cover Lock Switch	Used to lock the battery cover and to release it.
25	Battery Pack Cover	Used to cover the battery compartment that holds the battery pack inside.
26	Strap Holes	Used to attach the strap.
27	Power Supply, Charge Terminals	Used to supply power to the terminal and to charge the battery pack via either Cradle or Cradle-type Battery Charger.
28	micro SD Card Slot	For insertion of a micro SD card into the slot in the battery compartment.
29	SIM Card Slot	For insertion of a micro SIM card into the slot in the battery compartment.

Note:

The following models do not integrate the microphone because the capability of voice data transmission over Internet Protocol (VoIP) is prohibited by the Chinese radio related regulations.

DT-X30R-30-CN

DT-X30GR-30-CN

DT-X30GR-30C-CN

1.4.2 HA-G60IO

The following external views show the USB Cradles (HA-G60IO, HA-G60IO-CN). Refer to Table 1.4 for each referenced part on the cradle.

Views

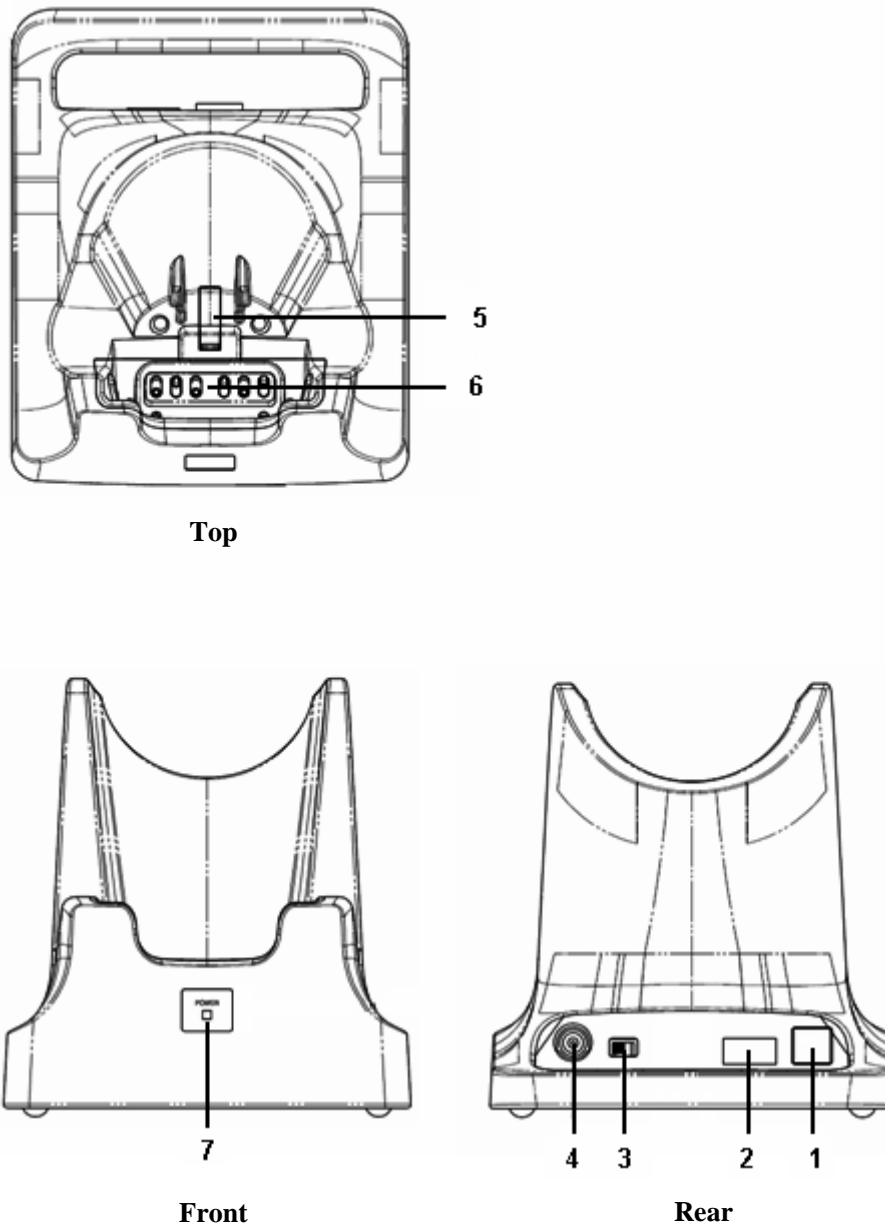


Figure 1.3

Table 1.4

No.	Name	Description
1	USB Client Port	This port is used to transmit data (download or upload) by connecting the Cradle to a PC using USB cable (DT-380USB). The dedicated driver must be installed in the PC before connecting the Cradle to the PC.
2	USB Host Port	This port is used to connect a USB peripheral device.
3	Selector Switch	This switch is used to switch between the USB host port and USB client port.
4	AC Adaptor Jack	Connect the dedicated AC adaptor, AD-S42120B, here.
5	Terminal Detect Switch	This switch detects when the terminal is seated correctly on the Cradle.
6	Power Contacts	Power is supplied to the terminal via these contacts.
7	Power LED	This LED indicates the power status and the mounting status of the terminal. Off : The terminal is not installed. Flashing Green : Power is on and the terminal is mounted correctly.

1.4.3 HA-G62IO

The following external views show the Ethernet Cradles (HA-G62IO, HA-G62IO-CN). Refer to Table 1.5 for each referenced part on the cradle.

Views

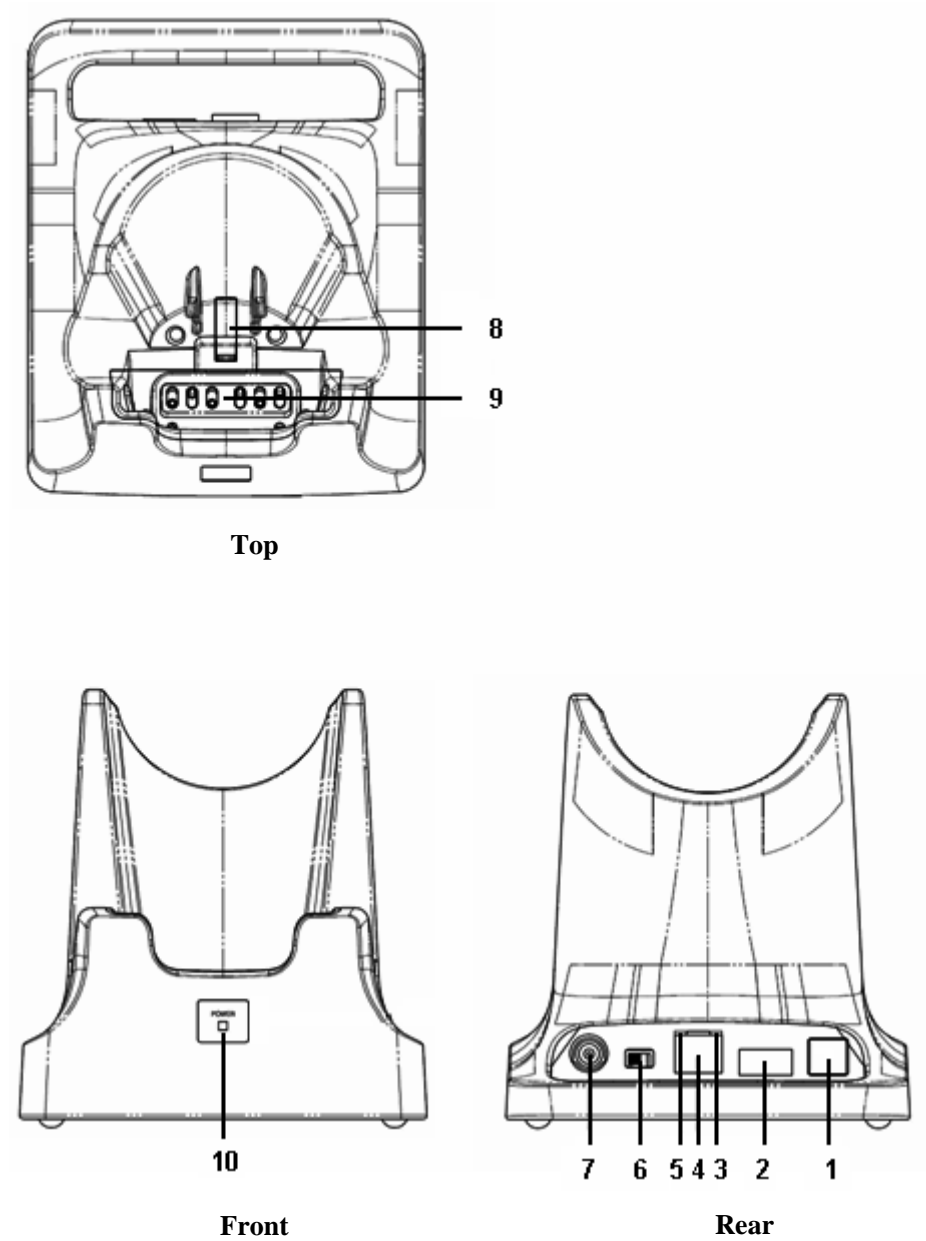


Figure 1.4

Table 1.5

No.	Name	Description
1	USB Client Port	This port is used to transmit data (download, upload) by connecting the Ethernet Cradle to PC using USB cable (DT-380USB). The dedicated driver must be installed in the PC before connecting the cradle to the PC.
2	USB Host Port	This port is used to connect a USB peripheral device.
3	LAN Connection Status LED	This LED shows the LAN connection status. Off : LAN cable not connected correctly. On in Green : LAN cable connected correctly.
4	LAN Port	This port is used for connecting the cradle to PC or hub via LAN cable so that data can be transmitted (uploaded or downloaded). The special driver must be installed in the terminal.
5	LAN Communication Status LED	This LED shows the LAN operation status. Off : No communication. Flashing : Communication in progress.
6	Selector Switch	This switch is used to switch between USB connection and LAN connection.
7	AC Adaptor Jack	Connect the dedicated AC adaptor, AD-S42120B, here.
8	Terminal Detect Switch	This switch detects when the terminal is mounted correctly on the cradle.
9	Ethernet Cradle Contacts	Power is supplied to the terminal via these contacts.
10	Power LED	This LED indicates the power status and the mounting status of the terminal. Off : The terminal is not mounted. Or, the AC adaptor is not connected. Flashing Green : Power is turned on, and the terminal is correctly set in the cradle.

1.4.4 HA-G30CHG

The following external views show the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN). Refer to Table 1.6 for each referenced part on the charger.

Views

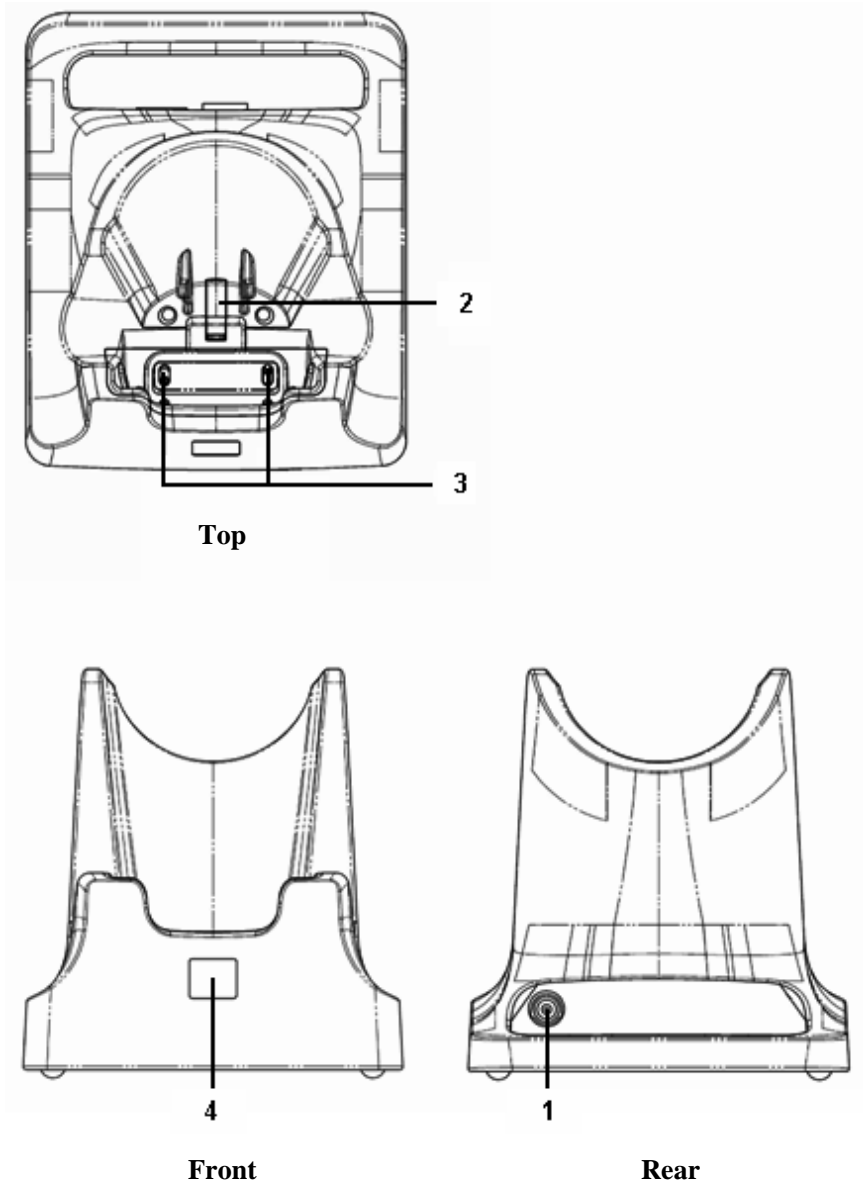


Figure 1.5

Table 1.6

No.	Name	Description
1	AC Adaptor Jack	Connect the dedicated AC adaptor, AD-S42120B, here.
2	Terminal Detect Switch	This switch detects when the terminal is mounted correctly on the charger.
3	Power Contacts	Power is supplied to the terminal via these contacts.
4	Power LED	This LED indicates the power status and the mounting status of the terminal. Off : The terminal is not mounted. Flashing Green : Power is turned on and the terminal is mounted correctly.

1.4.5 HA-G35CHG

The following external views show the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN). Refer to Table 1.7 for each referenced part on the charger.

Views

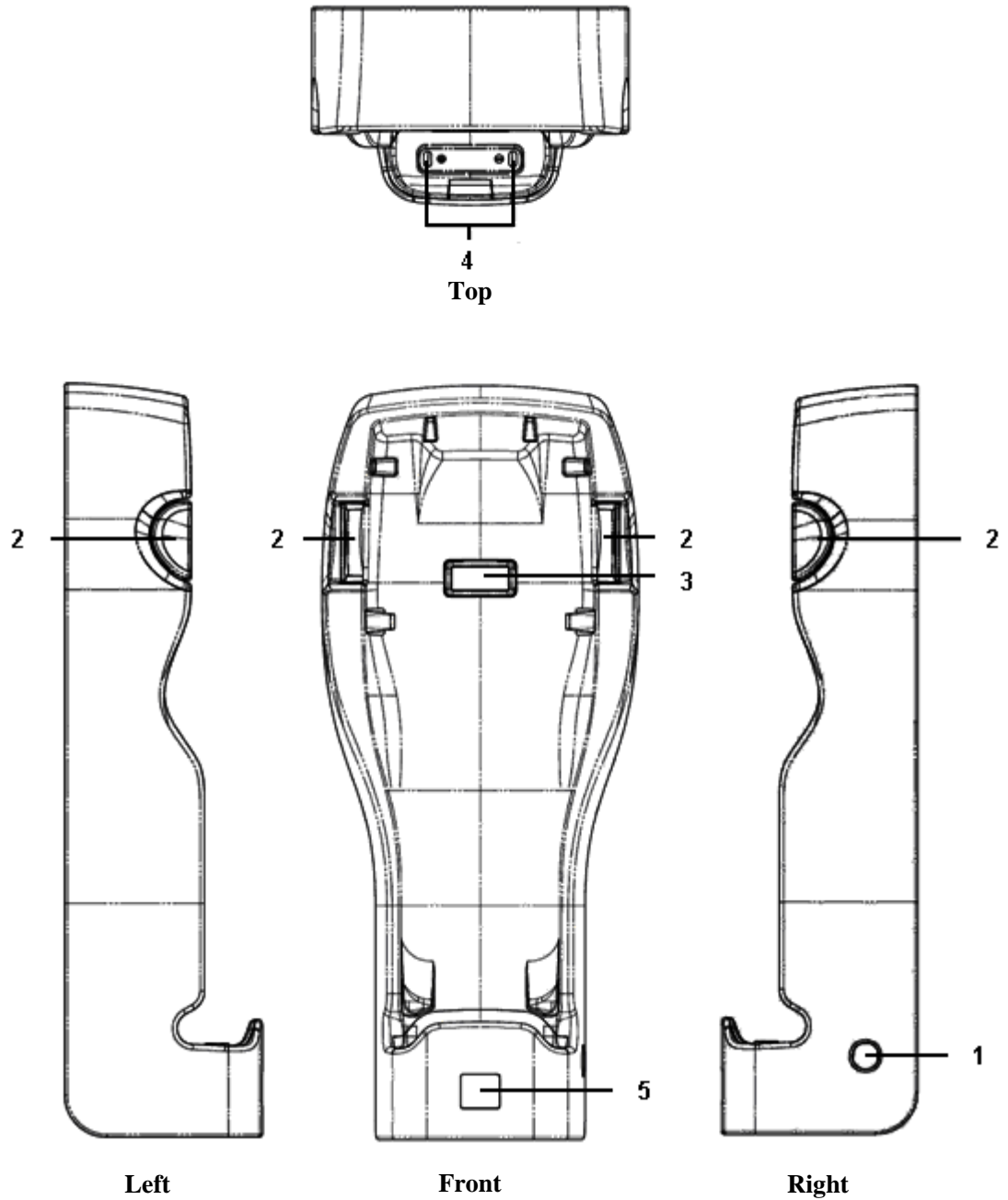


Figure 1.6

Table 1.7

No.	Name	Description
1	DC Jack	This is used to supply power by connecting to cigarette lighter socket in vehicle via the dedicated cable.
2	Remove Buttons	These are used to remove the terminal from the Car Mounted-type Battery Charger.
3	Terminal Detect Switch	This switch detects when the terminal is mounted correctly on the charger.
4	Power Contacts	Power is supplied to the terminal via these contacts.
5	Charge Indicator LED	This LED indicates the power status and the mounting status of the terminal. Off : The terminal is not mounted. Flashing Green : Power is turned on and the terminal is mounted correctly.

1.4.6 HA-G32DCHG

The following external views show the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN). Refer to Table 1.8 for each referenced part on the charger.

Views

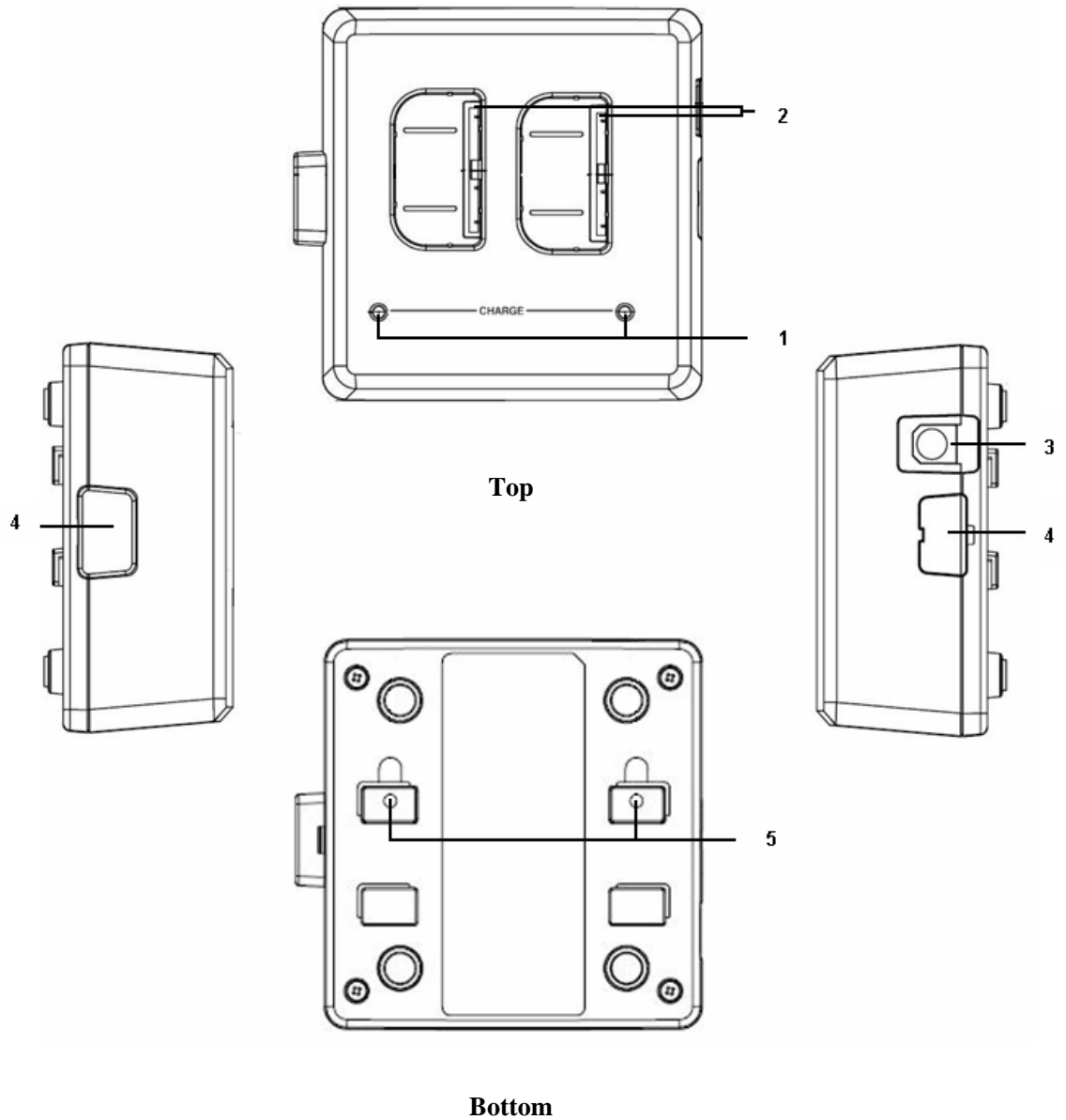


Figure 1.7

Table 1.8

No.	Name	Description
1	Charge Indicator LED	This LED indicates the charge status of battery pack(s). Off : Battery pack is not mounted. Red : Charging. Flashing Red : Problem on battery pack. Green : Charging complete. Flashing Green : Standby.
2	Power Contacts	Power is supplied to the battery packs via these contacts.
3	AC Adaptor Jack	This is used to supply power by connecting the dedicated AC adaptor, AD-S42120B, here.
4	Dual Battery Charger Connection Port	Used to connect multiple Dual Battery Chargers each other.
5	Connection Bracket Attachment Holes	The connection bracket attaches here when you connect multiple Dual Battery Chargers.

1.4.7 HA-G20BAT

The following external view shows the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

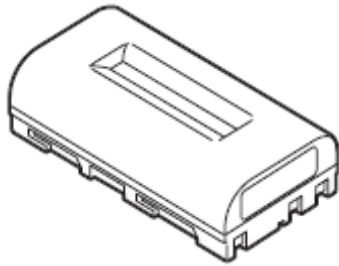
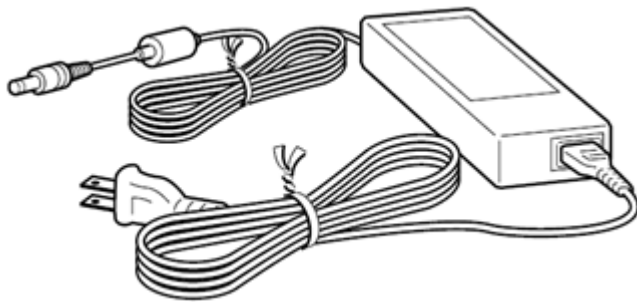


Figure 1.8

1.4.8 AD-S42120B

The following external view shows the AC Adaptor (AD-S42120B, AD-S42120B-CN).



The power cable does not come as standard with the AC adaptor, AD-S42120B. The above figure shows the AD-S42120BE.

Figure 1.9

2. Hardware Specifications

2.1 DT-X30

Tables 2.1 and 2.2 explain about the hardware specifications of all models of DT-X30 series including the models with “-CN” denotation.

Table 2.1

Item	Specification	Remark
CPU / Memory		
CPU	Marvell® Xscale Processor PXA320 runs at 624 MHz	
RAM	128 MB	
FROM	128 MB (user area; approx. 60 MB)	
OS	Microsoft® Windows® CE6.0 R2 English Version	Model dependant. See Table 1.1.
	Microsoft® Windows Mobile® 6.1 English Version	
Laser Scanner (DT-X30R-10, G-10-CN, GR-10, GR-10C, R-15, GR-15, GR-15C)		
Wave Length	650±10 nm	
Optical Output	<1 mW	
No. of scannings	100±20 per second	
Resolution	0.127 mm (minimum) or greater	
PCS	0.45 (minimum) or greater	
Readable distance	Approximately 40 to 400 mm	
Readable width	Max. 308 mm	- at 400 mm depth
Daylight for scanning	50,000 Lux or less	
Readable bar code symbologies	UPC-A, UPC-E, EAN8 (JAN8), EAN13 (JAN13), Codabar (NW-7), Code39, Interleaved 2of5 (ITF), MSI, Industrial 2of5, Code93, Code128 (EAN128), IATA, RSS-14 (GS1 DataBar Omnidirectional), RSS Limited (GS1 DataBar Limited), RSS Expanded (GS1 DataBar Expanded), RSS-14 Stacked (GS1 DataBar Stacked), RSS Expanded Stacked (GS1 DataBar Expanded Stacked)	

Continue.

CMOS Imager (DT-X30R-30, R-30-CN, GR-30, GR-30-CN, GR-30C, GR-30C-CN, R-35, G-35U, G-35UC, GR-35, GR-35C)		
Method	C-MOS Imager, 752 x 480 (Wide VGA), monochrome	
Aimer method	Laser 650+10nm or -5nm <1 mW	
Laser emit angle	Redirected downward at 37 degree	
Resolution	1D	: 0.15mm
	Stacked 2D	: 0.169mm
	Matrix 2D	: 0.339mm
PCS	0.45 (minimum)	

Readable distance (Resolution = 1.0mm)	1D : Approx. 40 to 410 mm Stacked 2D : Approx. 50 to 250 mm Matrix 2D : Approx. 60 to 150 mm	
Readable width	Max. 29 mm	- At readable distance 40 mm
	Max. 265 mm	- At readable distance 365 mm
Focal distance	4.5 inches	
Daylight for scanning	50,000 Lux or less	
Readable 1D symbologies	UPC-A, UPC-E, EAN8, EAN13, Codabar (NW-7), Code39, MSI, Interleaved 2of5 (ITF), Code93, Code128 (EAN128), Code11, IATA, RSS-14 (GS1 DataBar Omnidirectional), RSS Limited, (GS1 DataBar Limited), RSS Expanded, (GS1 DataBar Expanded)	
Readable Stacked 2D symbologies	PDF417, Micro PDF, Code49, TLC39, Composite, Codablock F, RSS-14 Stacked (GS1 DataBar Omnidirectionalstacked), RSS Expanded Stacked (GS1 DataBar Expanded Stacked), RSS-14 Stacked (GS1 DataBar Stacked), RSS Expanded Stacked (GS1 DataBar Expanded Stacked)	
Readable Matrix 2D symbologies	Aztec, DataMatrix, Maxicode, QR Code	
Display		
Display device	3.5-inch Advanced 2-way TFT LCD	
No. of dots	240 (horizontal) x 320 (vertical)	See note 2.
Dot pitch	0.153 (horizontal) x 0.153 (vertical) mm	
Gradation	65,536 colors	
Display font	Scalable font	
Backlight	LED backlight	
Viewing angle	50 degree or more (Up, Down, Left, Right)	

Continue.

Indicator		
LED	1pc x LED in 2 colors, 1pc x LED in 3 colors	
Input		
Keyboard	See Table 1.3.	
Control keys	Power key, Reset switch	
Trigger keys	R Trigger key, L Trigger key, Center Trigger key	

Infrared communication interface		
Standard	IrDA ver. 1.3 Low power compatible	
Communication process	Half duplex	
Synchronization	Start and stop synchronous communication, frame method	
Baud rate (in bps)	9,600, 19,200, 38,400, 57,600, 115,200, 4M	
Communication range	0 (contact) to 0.2 m	
WLAN (DT-X30R-10, GR-10, GR-10C, R-30, R-30-CN, GR-30, GR-30-CN, GR-30C, GR-30C-CN, R-15, GR-15, GR-15C, R-35, GR-35, GR-35C)		
Standard	IEEE 802.11b/g	
Module no.	LBWA18HEPZ-135	- By Murata Manufacturing Co., Ltd.
Radio type	Spread Spectrum	
Emission Designation	IEEE801.11b : D1D, G1D IEEE802.11g : G1D	- ITU
Spectrum Spread modulation	IEEE802.11 b : DSSS IEEE802.11 g : OFDM	
Modulation type	BPSK, QPSK, CCK, 16QAM, 64QAM	
Frequency range	IEEE802.11b/g 2,400 to 2,483.5 MHz	
Baud rate	IEEE802.11b : 11 Mbps (maximum) IEEE802.11g : 54 Mbps (maximum)	
Communication range	IEEE802.11b/g : 50 m (indoor) to 150 m (outdoor)	- Vary depending on the environment condition
Number of channels	13	
Channel spacing	5MHz	
Channel band width	22MHz	
Output power	IEEE802.11b : 12dBm (minimum) 15dBm (maximum) IEEE802.11g : 12dBm (minimum) 14dBm (maximum)	
Other feature	Roaming among Access-Points	

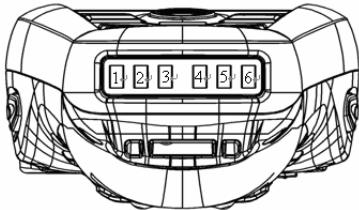
Continue.

Bluetooth Class 2 (DT-X30R-10, G-10-CN, GR-10, GR-10C, R-30, R-30-CN, GR-30, GR-30-CN, GR-30C, GR-30C-CN, R-15, GR-15, GR-15C, R-35, GR-35, GR-35C)		
Standard	Bluetooth® specification Ver.2.0+EDR	
Module no.	LBMA46LCS3-140	- By Murata Manufacturing Co., Ltd.
Radio type	Spread Spectrum	
Emission Designation	F1D, G1D	- ITU
Spectrum Spread modulation	Frequency Hopping (“FHSS”)	
Modulation type	GFSK (1Mbps), $\Pi/4$ -dqpsk (2Mbps), 8-DPSK (3Mbps)	
Frequency range	2,400 to 2,483.5 MHz	
Communication range	Approx. 3 m	- Vary depending on the environment conditions
Number of channels	79	-
Channel spacing	1 MHz	-
Channel band width	1 MHz	-
Output power	Max. 4 dBm (PowerClass 2)	-

GSM		
Standard	GSM release 99	
Module no.	XT 75 REL1	- By Siemens AG
Emission Designation	GPRS : 300KGXW EGPRS(EDGE) : 300KG7W	- ITU
Communication features	Packet data	
Data transfer	Packet	GPRS: Multi Slot Class 12 Mobile Station Class B Coding Scheme CS1-4 EGPRS(EDGE): Multi Slot Class 10 Mobile Station Class B Coding Scheme MCS1-9
Modulation type	GSMK / 8-PSK (EGPRS(EDGE))	
Frequency range	GSM850 Uplink : 824 to 849 MHz Downlink : 869 to 894 MHz E-GSM900 Uplink : 880 to 915 MHz Downlink : 925 to 960 MHz GSM1800 Uplink : 1,710 to 1,785 MHz Downlink : 1,805 to 1,880 MHz GSM1900 Uplink : 1,850 to 1,910 MHz Downlink : 1,930 to 1,990 MHz	

Continue.

No. of Channels	GSM850 : 124 E-GSM900 : 174 GSM1800 : 374 GSM1900 : 299	
Channel spacing	200 KHz	
Channel band width	200 KHz	
Output power	GSM850 : 33 dBm E-GSM900 : 33 dBm GSM1800 : 30 dBm GSM1900 : 30 dBm	
GPS		
General specification	16 channels and receiver / L1 1575.42 MHz, C / A code	
Protocol	NMEA-0183	
Sensitivity	Acquisition sensitivity: -141 dBm Tracking sensitivity : -158 dBm	

SIM		
Standard	ISO7816 IC Card standard	
General specification	3V, 1.8V SIM card supported	
micro SD	SDHC supported	
Expansion port		- For connecting an external device
USB		
Host	Baud rate	Full speed (12 Mbps) Low speed (1.5 Mbps)
	Power to external device	- See Tables 2.3 and 2.5.
Client	Baud rate	Full speed (12 Mbps)
Power contacts		
Terminal layout	 <p>See Table 2.2.</p>	- The layout is viewed when the terminal is placed with the display panel upward.
Camera		
Number of pixels	Approximately 2,000,000 pixels	- 1,600 x 1,200 pixels
Device	1 / 4.0-type CMOS color	
Aperture	2.9	
Focal distance	f = 3.45 mm (Auto focus)	
Image capture range	10 cm to infinite	

Continue.

LED light	21,000 mcd	
Speaker	Monaural	
Microphone	Monaural	- See note 1.
Power		
Operating power	Lithium-ion battery pack	- HA-G20BAT
Memory backup	Lithium battery (rechargeable)	- Integrated
Operating period	Approx. 8 hours	- Based on the ratio of cyclic operation of “Standby: Scanning”: “WWAN” at 3:1:2.
	Approx. 13 hours	- Based on the ratio of cyclic operation of “Standby: Scanning”: “WLAN” at 6.5:1.5:2. - Under the conditions that the CPU speed is set to auto power save mode and the backlight is turned off.

	Approx. 12 hours	- Based on the ratio of cyclic operation of “Standby: Key input: Scanning” at 20:1:1. - Under the condition that the CPU speed is set to auto power save mode and the backlight is turned off.
Memory backup period (with Memory backup battery only)	Approx. 10 minutes for RAM Approx. 96 hours for integrated clock	- Lithium battery (on-board) is fully charged. - At room temperature.
Memory backup period (with battery pack and memory backup battery)	Approx. 72 hours for RAM	- The backup period starts when “Main battery low warning” appears.
Battery pack charge period	Approx. 5 hours	- Power on the terminal is turned off while the battery is being charged. - At room temperature.
Memory backup battery charge period	Approx. 30 minutes (for a level where memory backup is possible.) Approx. 1.5 days (for fully charged level)	- Battery pack is being installed in the terminal. - At room temperature.
Memory backup battery rated capacity	25 mAh	

Continue.

Method to charge memory backup battery	When power supply is made via cradle	Yes	
	When power supply is made by installed battery pack (when terminal's power on)	Yes	
	When power supply is made by installed battery pack (when terminal's power off)	Yes	

Notes:

1. The microphone is not integrated in DT-X30R-30-CN, DT-X30GR-30-CN and DT-X30GR-30C-CN to comply with the relevant radio regulations of China.

2. Dead Pixels

The LCD panel employed in this product uses high precision and substantial number of components which commonly cause a small number of the pixels not to light or to remain lit all the time. This is due to the characteristics of LCD panel yield in accuracy over 99.99% and permissible.

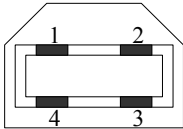
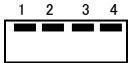
Table 2.2

Pin no.	Signal	Description	Direction
1	V CRADLE	Power supply/Charge to the terminal	-
2	D +	USB D+	IN / OUT
3	D -	USB D-	IN / OUT
4	USB_ID	Switch-over between USB host and USB client	IN
5	V BUS	Power from USB cradle	OUT IN / OUT
6	GND	GND	-

2.2 HA-G60IO

Tables 2.3 and 2.4 and Figure 2.1 explain about the hardware specifications of the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 2.3

Item		Specification	Remark	
USB	Standard	USB Ver.1.1 compatible		
	Baud rate	Max. 12 Mbps (maximum)		
	Connector	 USB connector B type	<ul style="list-style-type: none"> - 1 VBus - 2 - Data (D -) - 3 + Data (D+) - 4 GND 	
		 USB connector A type	<ul style="list-style-type: none"> - 1 VBus - 2 - Data (D -) - 3 + Data (D+) - 4 GND 	
Power from AC Adaptor	Input voltage	DC 12V±5%		
	Current consumption	approx. 3A (max)	- When supplying power or transmitting data.	
	Plug	EIAJ RC-5320A type 4	- Center +	
	AC Adaptor	AD-S42120B or AD-S42120B-CN	- Dedicated AC adaptors	
Power	USB host	Standard	USB Ver. 1.1	
		Baud rate	12 Mbps (maximum) 1.5 Mbps (minimum)	
		Power to external device	5V±5%, 500 mA (maximum)	
	USB client	Standard	USB Ver. 1.1	
		Baud rate	12 Mbps (maximum)	
		Pin Layout	See Figure 2.1.	
		Description	See Table 2.4.	
	Charge/ Power supply to terminal	Output voltage	DC9.5±0.5V	
		Output current	2.7 A (maximum)	
		Charge method	Constant voltage method	- With current limitation control
		Battery charge time	Approx. 5 hours	
	Dimensions		Approx. 120 (W) x 144 (D) x 129 (H) mm	
Weight		Approx. 300 g		

- Pin layout

The pin layout below shows when the cradle is viewed at its front.

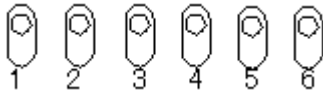


Figure 2.1

- Pin layout and the description

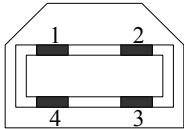

Table 2.4

Pin no.	Signal	Description	Direction
1	V CRADLE	Power supply to the terminal and charge the battery pack installed in the terminal.	-
2	D +	USB D +	IN / OUT
3	D -	USB D -	IN / OUT
4	USB_ID	Switch-over between USB host and USB client	OUT
5	V BUS	Power from USB cradle	IN / OUT
6	GND	GND	-

2.3 HA-G62IO

Tables 2.5 and 2.6 and Figure 2.2 explain about the hardware specifications of the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 2.5

Item		Specification	Remark
USB	Standard	USB Ver.1.1 compatible	
	Baud rate	Max. 12 Mbps (maximum)	
	Connector	 USB connector B type	<ul style="list-style-type: none"> - 1 VBus - 2 - Data (D -) - 3 + Data (D+) - 4 GND
		 USB connector A type	<ul style="list-style-type: none"> - 1 VBus - 2 - Data (D -) - 3 + Data (D+) - 4 GND
LAN	Communication protocol	IEEE802.3 standard	
	Media type	10base-T/100base-TX auto-switched	
Power from AC Adaptor	Input voltage	DC 12V±5%	
	Current consumption	approx. 3A (maximum)	- When supplying power or transmitting data.
	Plug	EIAJ RC-5320A type 4	- Center +
	AC Adaptor	AD-S42120B or AD-S42120B-CN	
Power	USB host	Standard	USB Ver. 1.1
		Baud rate	12 Mbps (maximum) 1.5 Mbps (minimum)
		Power to external device	5V±5%, 500 mA (maximum)
	USB client	Standard	USB Ver. 1.1
		Baud rate	12 Mbps (maximum)
		Pin layout	See Figure 2.2.
		Description	See Table 2.6.
	Charge/Power supply to terminal	Output voltage	DC9.5V±0.5V
		Output current	2.7A (maximum)

Continue.

	Charge method	Constant voltage method	- By integrated battery charge circuit
	Battery charge time	Approx. 5 hours	- By integrated battery charge circuit
Dimensions		Approx. 120 (W) x 144 (D) x 129 (H) mm	
Weight		Approx. 300 g	

- Pin layout

The pin layout below shows when the cradle is viewed at its front.



Figure 2.2

- Pin layout and the description

Table 2.6

Pin no.	Signal	Description	Direction
1	V CRADLE	Power supply to the terminal and charge to battery pack installed in the terminal.	-
2	D +	USB D +	IN / OUT
3	D -	USB D -	IN / OUT
4	USB_ID	Switch-over between USB host and USB client	OUT (Note 1)
5	V BUS	Power from/to USB cradle	IN / OUT (Note 2)
6	GND	GND	-



Notes:

1. The output is made from the cradle.
2. The direction “OUT” is for USB mode, or “IN” for LAN mode.

2.4 HA-G30CHG

Table 2.7 explains about the hardware specifications of the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).



Table 2.7

Item		Specification		Remark
Input from AC Adaptor	Input voltage	DC 12V±5%		
	Consumption current	2.6 A (maximum)		- When supplying power or transmitting data.
	Plug	EIAJ RC-5320A type 3		- Center pin +
	AC Adaptor	AD-S42120B or AD-S42120B-CN		
Pin layout				
Power supply/ Charge	Output voltage	DC9.5V±0.5V		
	Output current	2.7 A (maximum)		
	Charge method	Constant voltage		
	Charge period	Approx. 5 hours		- By integrated battery charge circuit
Dimensions		Approx. 120 (W) x 144 (D) x 129 (H) mm		
Weight		Approx. 300 g		

2.5 HA-G35CHG

Table 2.8 explains about the hardware specifications of the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 2.8

Item		Specification		Remark
Input from AC Adaptor	Input voltage	DC12 to 24V±5%		
	Consumption current	2.6A (maximum)		- When supplying power
	Plug	Dedicated cable bundled with the charger		
Pin layout		 Power Supply	 GND	- The pin layout - “Power Supply” at left and “GND” at right - appears when the charger is placed with the front being faced upward. - See Figure 1.6.
Power supply/ Charge	Output voltage	DC 9.5V±0.5V		
	Output current	2.7 A (maximum)		
	Charge method	Constant voltage (with current limitation control)		- By integrated battery charge circuit
	Charge period	Approx. 5 hours		- By integrated battery charge circuit
Dimensions		Approx. 287 (W) x 80 (D) x 75 (H) mm		
Weight		Approx. 620 g		

2.5.1 Mount Holes and Screws

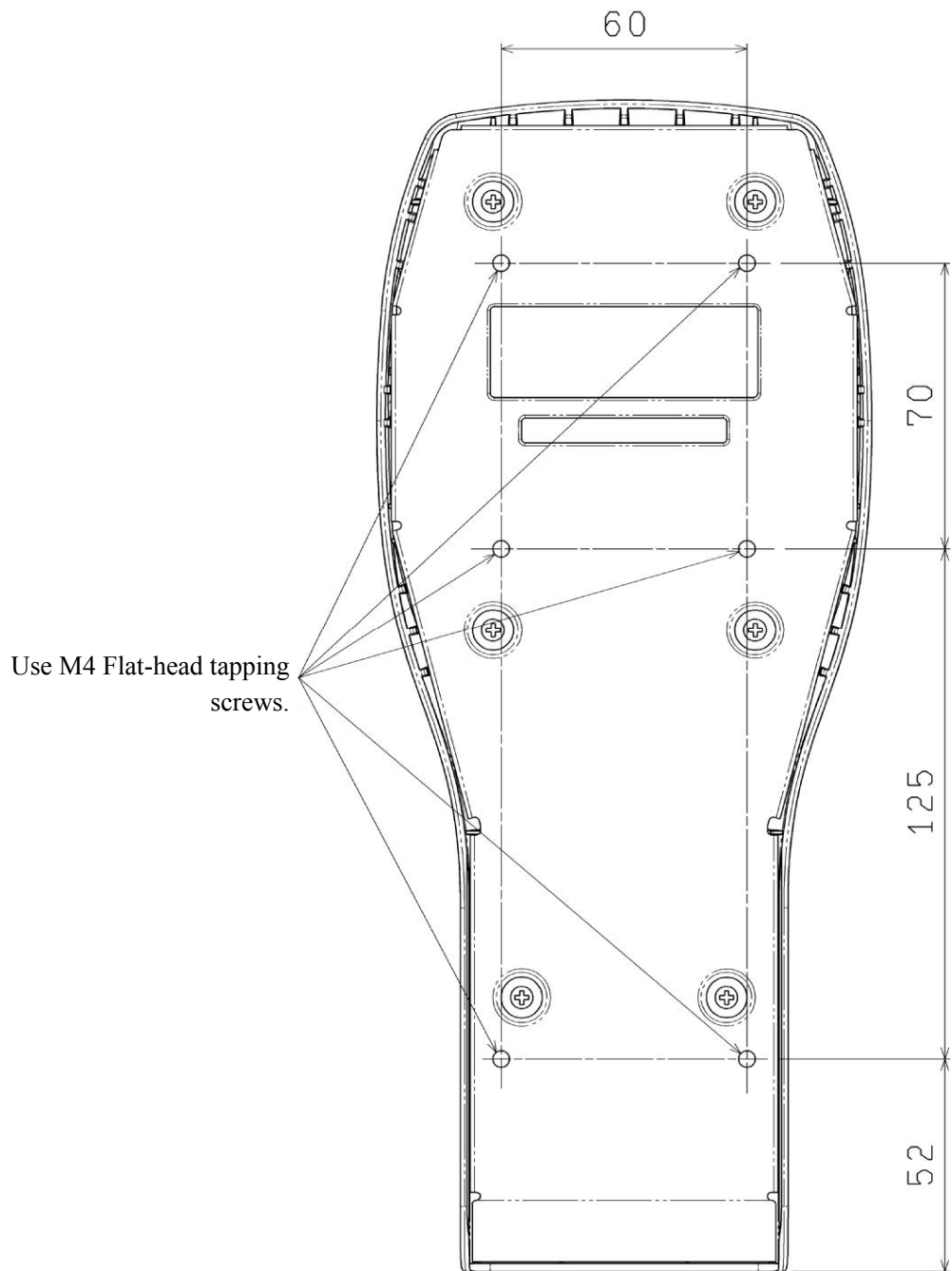


Figure 2.3

2.6 HA-G32DCHG

Table 2.9 explains about the hardware specifications of the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 2.9

Item		Specification	Remark
Input from AC Adaptor	Input voltage	DC 12V±5%	
	Consumption current	approx. 0.03 A	- No battery pack is mounted.
		approx. 3.5 A	- Battery pack(s) is being charged.
	Plug	EIAJ RC-5320A type 4	- Center pin +
AC Adaptor	AD-S42120B or AD-S42120B-CN		
Power supply/ Charge	Charge method	Constant voltage	- With current limitation control.
	Charge period	Approx. 4 hours	- To charge single battery.
		Approx. 5.5 hours	- To charge two batteries at the same time.
Dimensions		Approx. 104 (W) x 100 (D) x 50 (H) mm	
Weight		Approx. 168 g	

2.7 HA-G20BAT

Table 2.10 explains about the hardware specifications of the battery packs (HA-G20BAT, HA-G20BAT-CN).

Table 2.10

Item	Specification	Remark
Rated capacity	14.8 WH (2,000 mAh)	
Rated output voltage	DC 7.4 V	
Weight	Approx. 107 g	
Dimensions	Approx. 39 (W) x 72 (D) x 21 (H) mm	

2.8 AD-S42120B

Table 2.11 explains the hardware specifications of the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 2.11

Parameter		Specification	Remark
Original manufacturer's model no.		SA145A-1240U-6	- By Sino-American Electronic Co., Ltd.
Type		Switching regulator	
Input requirements	Rated input voltage	100 to 240VAC	
	Input voltage tolerance	90 to 264VAC	
	Nominal frequency	50 or 60 Hz	
	Frequency tolerance	47 to 63 Hz	
	Input current	1200mA (maximum)	- At input 100VAC/50Hz with full load
	No load power consumption (Off mode)	0.5W or less	- At input 240VAC/50Hz
	Inrush current	80A or less	- At input 100VAC to 240VAC - At cold start, maximum load.
	Average efficiency	83.6% (minimum)	- At input 115VAC/60Hz and 230VAC/50Hz with 25%, 50%, 75% and 100% load
Leakage current	0.25 mA or less	- At input 240VAC/50Hz	
Output requirements	Rated output voltage	DC12V	
	Rated output current	DC3.5A	
	Rated output power	42W	
	Minimum output current	0 A	
	Line regulation	±2% or less	- At full load and ±10% input voltage
	Load regulation	±5% or less	
	Ripple noise	100 mVp-p or less	- At O/P=12VDC, full load
Protections	Over load protection current	4.2 to 6.2 A	- At input 100VAC to 240VAC
	Over voltage protection	Clamp 190% output voltage maximum	
Hi-Pot Test (Dielectric strength)	AC3.0 KV for 1 second, 5mA (leak current) or less		
Insulation resistance	DC500V for 1 minute, 100MΩ or more		
Dimensions	Approx. 111 (D) x 50 (W) x 31 (H) mm		
Weight	Approx. 275 g		

3. Product Identification and Reference Numbers

On the back of the terminal and the dedicated options, there is a bar code and numbers printed on label as shown in the following figure. This bar code is represented by 15 digits of Code128 symbology and by alphanumeric characters beneath the bar code. The numbers from 1 to 9 in the figure represent identification and references of individual terminal. The numbers from 10 to 14 represent a manufacturing reference which is reserved by the manufacturer. See the figure for each meaning.

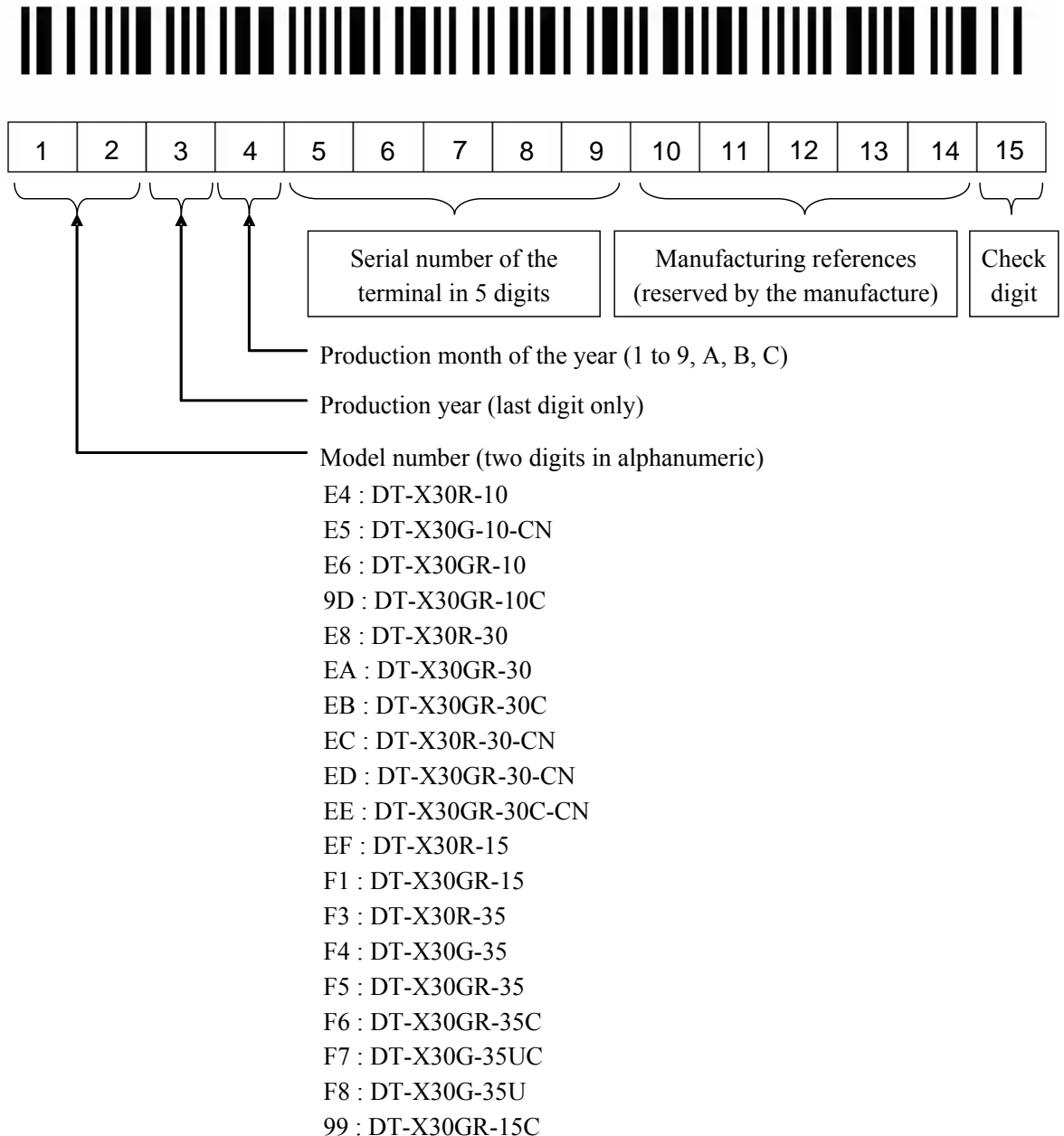


Figure 3.1

4. Quality References

This chapter describes about references of the DT-X30 and its dedicated options concerned with environmental performance, regulatory compliance, mechanical and electric durability, etc.

4.1 Environmental Performances

4.1.1 DT-X30

Table 4.1 explains about the environment performances on all models of DT-X30 series.

Table 4.1

Item	Specification	Remark / Condition
Temperature		
Operation	-20 °C to 50 °C	- 0 to 40 °C for charging battery
Non-operation	-20 °C to 70 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage		
Temperature	-20 °C to 60 °C	
Humidity	5 % to 90 %RH	
Dust and water-splash proof		
	IP64 level	- Compliant with IEC60529 standard

4.1.2 HA-G60IO

Table 4.2 explains about the environment performances on the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 4.2

Item	Specification	Remark / Condition
Temperature		
Operation	0 °C to 40 °C	
Non-operation	-20 °C to 70 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage in carton box		
Temperature	-20 °C to 60 °C	
Humidity	10 % to 90 %RH	- No condensation
Dust and water-splash proof		
	Not applicable	

4.1.3 HA-G62IO

Table 4.3 explains about the environment performances on the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 4.3

Item	Specification	Remark / Condition
Temperature		
Operation	0 °C to 40 °C	
Non-operation	-20 °C to 70 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage in carton box		
Temperature	-20 °C to 60 °C	
Humidity	10 % to 90 %RH	- No condensation
Dust and water-splash proof		
	Not applicable	

4.1.4 HA-G30CHG

Table 4.4 explains about the environment performances on the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).

Table 4.4

Item	Specification	Remark / Condition
Temperature		
Operation	0 °C to 40 °C	
Non-operation	-20 °C to 70 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage in carton box		
Temperature	-20 °C to 60 °C	
Humidity	10 % to 90 %RH	- No condensation
Dust and water-splash proof		
	Not applicable	

4.1.5 HA-G35CHG

Table 4.5 explains about the environment performances on the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 4.5

Item	Specification	Remark / Condition
Temperature		
Operation	-20 °C to 50 °C	
Non-operation	-40 °C to 85 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage in carton box		
Temperature	-20 °C to 60 °C	
Humidity	10 % to 90 %RH	- No condensation
Dust and water-splash proof		
	Not applicable	

4.1.6 HA-G32DCHG

Table 4.6 explains about the environment performances on the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 4.6

Item	Specification	Remark / Condition
Temperature		
Operation	0 °C to 40 °C	
Non-operation	-20 °C to 60 °C	
Humidity		
Operation	10 % to 80 %RH	- No condensation
Non-operation	5 % to 90 %RH	
Storage in carton box		
Temperature	-20 °C to 60 °C	
Humidity	10 % to 90 %RH	- No condensation
Dust and water-splash proof		
	Not applicable	

4.1.7 HA-G20BAT

Table 4.7 explains environment performances on the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

Table 4.7

Item	Specification	Remark / Condition
Temperature		
Operation	Compatible with the temperature range for the terminal during discharge, or with that of the battery chargers during charge. See Table 4.1 for discharge. Or, any one of Tables 4.2 to 4.6 for charge.	
Storage	Compatible with the temperature range for the terminal. See Table 4.1.	
Humidity		
Operation	Compatible with the humidity range for the terminal during discharge, or with that of the battery chargers during charge. See Table 4.1 for discharge. Or, any one of Tables 4.2 to 4.6 for charge.	
Storage	Compatible with the humidity range for the terminal. See Table 4.1.	
Storage in carton box		
Temperature	-25 to 30 °C	- The period of storage is recommended within one year.
Humidity	90 %RH or less	
Water-splash resistance		
	Not applicable.	

4.1.8 AD-S42120B

Table 4.8 explains environmental performances on the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 4.8

Item	Specification	Remark / Condition
Temperature		
Operation	0 to 40 °C	
Storage	-20 to 60 °C	
Humidity		
Operation	20 to 80 %RH	- No condensation
Storage	10 to 90 %RH	

4.2 Electrical Performances

4.2.1 DT-X30

Table 4.9 explains about electric performances on all models of DT-X30 series including the models with “-CN” denotation.

Table 4.9

Item	Specification	Remark / Condition
Current consumption	DC 1.8A : DT-X30R-10, R-30, R-15, R-35 DC 2.2A : DT-X30G-10, G-35UC DC 2.3A : DT-X30GR-10, GR-30 DC 2.4A : DT-X30GR-30C, GR-10C, GR-15, GR-15C, GR-35, GR-35C	
Anti-static strength		
Malfunction	±4 KV (In contact) ±8 KV (In air)	- 150 pF, 330ohm
Destruction	±12 KV	

4.2.2 HA-G60IO

Table 4.10 explains about electric performances on the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 4.10

Item	Specification	Remark / Condition
Input voltage	DC12V±5%	
Anti-static strength		
In contact	±4 KV	- 150 pF, 330 ohm
In air	±8 KV	
Instant power interruption	10 milliseconds or less	
Line noise strength		
Malfunction	1,000 V	- Pulse frequency : 5KHz - Burst cycle : 300 milliseconds - Number of pulses : 75 - Burst interval : 15 milliseconds

4.2.3 HA-G62IO

Table 4.11 explains about electric performances on the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 4.11

Item	Specification	Remark / Condition
Input voltage	DC12 V±5%	
Anti-static strength		
In contact	±4 KV	- 150pF, 330 ohm
In air	±8 KV	
Instant power interruption	10 milliseconds or less	
Line noise strength		
Malfunction	1,000V	<ul style="list-style-type: none"> - Pulse frequency : 5KHz - Burst cycle : 300 milliseconds - Number of pulses : 75 - Burst interval : 15 milliseconds

4.2.4 HA-G30CHG

Table 4.12 explains about electric performances on the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).

Table 4.12

Item	Specification	Remark / Condition
Input voltage	DC12V±5%	
Anti-static strength		
In contact	±4 KV	- 150 pF, 330 ohm
In air	±8 KV	
Instant power interruption	10 milliseconds or less	
Line noise strength		
Malfunction	1,000 V	<ul style="list-style-type: none"> - Pulse frequency : 5 KHz - Burst cycle : 300 milliseconds - Number of pulses : 75 - Burst interval : 15 milliseconds

4.2.5 HA-G35CHG

Table 4.13 explains about electric performances on the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 4.13

Item	Specification	Remark / Condition
Input voltage	DC12 to 24V±5%	
Anti-static strength		
In contact	±4 KV	- 150 pF, 330 ohm
In air	±8 KV	
Instant power interruption	10 milliseconds or less	
Line noise strength		
Malfunction	1,000 V	<ul style="list-style-type: none"> - Pulse frequency : 5 KHz - Burst cycle : 300 milliseconds - Number of pulses : 75 - Burst interval : 15 milliseconds

4.2.6 HA-G32DCHG

Table 4.14 explains about electric performances on the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 4.14

Item	Specification	Remark / Condition
Input voltage	DC12V±5%	
Anti-static strength		
In contact	±6 KV	- 150 pF, 330 ohm
In air	±8 KV	
Line noise strength		
Malfunction	1,000 V	<ul style="list-style-type: none"> - Pulse frequency : 5 KHz - Burst cycle : 300 milliseconds - Number of pulses : 75 - Burst interval : 15 milliseconds

4.2.7 HA-G20BAT

The following table explains electrical performances on the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

Table 4.15

Item	Specification	Remark / Condition
Anti-static strength		
Malfunction	6 KV (contact) / 8KV (in air)	
Destruction	12 KV (contact, in air)	

4.2.8 AD-S42120B

Table 4.16 explains electrical performance on the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 4.16

Item	Specification	Remark / Condition
Withstanding noise		
Surge	Line to line: ± 1 KV (Peak) Line to earth (ground): ± 2 KV (Peak)	- IEC61000-4-5
Anti-static strength (ESD)	± 4 KV (direct contact) ± 8 KV (direct contact)	- IEC61000-4-2

4.3 Mechanical Performances

4.3.1 DT-X30

Table 4.17 explains about mechanical performances on all models of DT-X30 series including the models with “-CN” denotation.

Table 4.17

Item	Specification	Remark / Condition
Resistance to drop impact (height)	150 cm	- 5 cycles on each of 6 faces and 4 corners.
Resistance to drop impact in carton box (height)	70 cm (in individual carton box)	- 1 cycle on each of 6 faces, 1 corner and three edges.
	70 cm (in master carton box)	
Resistance to vibration	3.0 G	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes

4.3.2 HA-G60IO

Table 4.18 explains about mechanical performances on the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 4.18

Item	Specification	Remark / Condition
Resistance to vibration	1.5 G or less	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes - While the power is turned on and the terminal is not being mounted on the cradle. - No communication
Resistance to vibration (in carton box)	1.5 G or less	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Resistance to drop impact		
In bare condition	70 cm	- 1 cycle on each of 6 faces onto concrete floor
In individual carton	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges
In master carton	50 cm or less	

4.3.3 HA-G62IO

Table 4.19 explains about mechanical performances on the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 4.19

Item	Specification	Remark / Condition
Resistance to vibration	1.5 G or less	<ul style="list-style-type: none"> - 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes - While the power is turned on and the terminal is not being mounted on the cradle. - No communication
Resistance to vibration (in carton box)	1.5 G or less	<ul style="list-style-type: none"> - 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Resistance to drop impact		
In bare condition	70 cm	- 1 cycle on each of 6 faces onto concrete floor
In individual carton	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges
In master carton	50 cm or less	

4.3.4 HA-G30CHG

Table 4.20 explains about mechanical performances on the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).

Table 4.20

Item	Specification	Remark / Condition
Resistance to vibration	1.5 G or less	<ul style="list-style-type: none"> - 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes - While the power is turned on and the terminal is not being mounted on the charger. - No communication
Resistance to vibration (in carton box)	1.5 G or less	<ul style="list-style-type: none"> - 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Resistance to impact		
In bare condition	70 cm	- 1 cycle on each of 6 faces onto concrete floor
In individual carton	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges
In master carton	50 cm or less	

4.3.5 HA-G35CHG

Table 4.21 explains about mechanical performances on the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 4.21

Item	Specification	Remark / Condition
Resistance to vibration	3.0 G or less	- 5 to 200 Hz - In X, Y, and Z directions - Reciprocally for 2 hours
		- 5 to 200 Hz - Reciprocally for 4 hours
Resistance to vibration (in carton box)	3.0 G or less	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Resistance to impact		
In bare condition	70 cm	- 1 cycle on each of 6 faces and four edges onto concrete
In individual carton	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges
In master carton	50 cm or less	

4.3.6 HA-G32DCHG

Table 4.22 explains about mechanical performances on the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 4.22

Item	Specification	Remark / Condition
Resistance to vibration	1.5 G or less	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes - While the power is turned off.
Resistance to vibration (in carton box)	1.5 G or less	- 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Resistance to impact		
In bare condition	70 cm	- 1 cycle on each of 6 faces and 4 edges onto concrete floor
In individual carton	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges
In master carton	60 cm or less	

4.3.7 HA-G20BAT

Table 4.23 explains about mechanical performances on the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

Table 4.23

Item	Specification	Remark / Condition
Resistance to vibration	1.5 G or less	<ul style="list-style-type: none"> - 10 to 55 Hz - In X, Y, and Z directions - Reciprocally for 30 minutes
Impact durability (in height of fall)		
In bare condition	100 cm or less	- 1 cycle on each of 6 faces onto P-tile surface.
In individual carton box	70 cm or less	- 1 on each of 6 faces, 1 corner and 3 edges onto concrete surface.
In master carton box	70 cm or less	

4.3.8 AD-S42120B

Table 4.24 explains mechanical performances on the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 4.24

Item	Specification	Remark / Condition
Resistance to vibration	0.5 G or less	<ul style="list-style-type: none"> - 10 to 100 Hz - In X, Y, and Z directions - Reciprocally for 10 minutes
Impact durability (in height of fall)		
In bare condition	70 cm or less	- 1 cycle on each of 6 faces onto P-tile surface.
In individual carton box	70 cm or less	- 1 cycle on each of 6 faces, 1 corner and 3 edges onto concrete surface.
In master carton box	70 cm or less	

4.4 Reliability

4.4.1 DT-X30

Table 4.25 explains about reliability on all models of DT-X30 series including models with “-CN” denotation.

Table 4.25

Item	Specification	Remark / Condition	
Service life			
Backlight	15,000 hours	- Half-value period	
LCD	50,000 hours	- MTTF (see note)	
Discharge/charge cycle longevity of battery pack	500 times	- 50% or more of the initial capacity	
Battery pack storage period (recommended)	One year or less	- At temperature in the range of -25 °C to 30 °C - At 80% of the battery’s capacity recovery rate	
Discharge/charge cycle longevity of memory backup battery	20,000 times	- Memory backup for a period of 10 minutes	
	50 times	- Memory backup until the cut-off voltage level	
Laser Scanner	10,000 hours		
C-MOS Imager	70,000 hours		
LED for the digital camera	1,000 hours	- Until the brightness reaches to 50% of the original brightness.	
No. of uses for the digital camera	18,000,000 times	- The life time is calculated based on when the flash is illuminated.	
Key input durability	Reset switch	1,000 times	
	Trigger keys	1,000,000 times	- 500 (times/day) x 365 (day) x 5 (year)
	Keys (except the Trigger keys)	500,000 times	- 250 (times/day) x 365 (day) x 5 (year)
Mounting/removing durability	Battery pack	4,000 times	- 2 (times/day) x 365 (day) x 5 (year)
	On Cradle-type charger	15,000 times	- 2 (terminals/Cradle-type charger) x 4 (times/day) x 365 (day) x 5 (year)
	Car Mounted-type battery charger	100,000 times	- 50 (accesses/day) x 365 (day) x 5 (year)
	On Ethernet cradle	15,000 times	- 2 (terminals/Ethernet cradle) x 4 (times/day) x 365 (day) x 5 (year)
	On USB cradle	15,000 times	- 2 (terminals/USB cradle) x 4 (times/day) x 365 (day) x 5 (year)
MTBF			
Electronic parts	35,902 hours	- Main PCB, Sub-PCB, Key PCB	
Digital camera	102,596 hours	-	

Note:

MTTF stands for “Mean time to failure”.

4.4.2 HA-G60IO

Table 4.26 explains about reliability on the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 4.26

Item		Specification	Remark / Condition
MTBF for electronic parts		100,000 hours	
Installing and removing	USB Client port connector	260 times	
	USB Host port connector	260 times	
Mounting the terminal on the cradle and removing		15,000 times	
Switching	Selector switch (USB Host or USB Client)	500 times	- One reciprocal switching is counted as one time.
Installing AC adaptor to and removing from	AC adaptor jack	100 times	

4.4.3 HA-G62IO

Table 4.27 explains about reliability on the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 4.27

Item		Specification	Remark / Condition
MTBF for electronic parts		50,000 hours	
Installing and removing	USB port's connector	260 times	
	LAN port's connector	100 times	
Mounting the terminal and removing		15,000 times	
Switching	Selector switch (USB Host or USB Client)	500 times	- One reciprocal switching as one time
Installing AC adaptor to and removing from	AC adaptor jack	100 times	

4.4.4 HA-G30CHG

Table 4.28 explains about reliability on the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).

Table 4.28

Item		Specification	Remark / Condition
MTBF for electronic parts		100,000 hours	
Mounting the terminal and removing from		15,000 times	
Connecting to the joint connector and removing from		100 times	

4.4.5 HA-G35CHG

Table 4.29 explains about reliability on the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 4.29

Item	Specification	Remark / Condition
MTBF for electronic parts	100,000 hours	
Mounting the terminal on and removing from	100,000 times	
Installing cable to and removing from	DC jack	100 times

4.4.6 HA-G32DCHG

Table 4.30 explains about reliability on the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 4.30

Item	Specification	Remark / Condition
MTBF for electronic parts	50,000 hours	
Mounting HA-G20BAT and removing it from	5,000 times	
Connecting to the joint connector and removing from	100 times	
Installing AC adaptor to and removing from	AC adaptor jack	100 times

4.4.7 HA-G20BAT

Table 4.31 explains about reliability on the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

Table 4.31

Item	Specification	Remark / Condition
Battery charge-discharge cyclic life	500 cycles	<ul style="list-style-type: none"> - Environment temperature : ordinary - The capacity after 500 cycles remains 50% of its initial capacity or more.

4.4.8 AD-S42120B

Table 4.32 explains about reliability on the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 4.32

Item	Specification	Remark / Condition
MTBF	100,000 hours	- At 25 °C MIL-HDBK-217F

4.5 Compliance

4.5.1 DT-X30

Tables 4.33 and 4.34 explain about compliance with the relevant regulatory standards and requirements for all models of DT-X30 series.

Table 4.33

Category	Standard / Requirement	DT-X30xx-xxx	
		R-10, R-30, R-35	GR-10, GR-30, GR-30C, GR-35, GR-35C
Safety	EN60950-1	Yes	Yes
	CNS14336 (Taiwan) (note)	Yes	Yes
	IEC60950-1 2 nd edition	Yes	Yes
EMC	RRL (Korea) (note)	Yes	N/A
EMI	CNS13438 (Taiwan) (note)	Yes	Yes
WLAN, Bluetooth Type Approval	EN 300328	Yes	Yes
	EN 301489-7 V1.2.1	N/A	Yes
	EN 301489-17 V1.2.1	Yes	Yes
	EN 301511 V9.0.2	N/A	Yes
	EN50360	N/A	Yes
	EN50371	Yes	Yes
	LP0002 or RTTE02 (Taiwan) (note)	Yes	Yes
	PLMN01 (Taiwan) (note)	N/A	Yes
	RRL (Korea) (note)	Yes	N/A
Bluetooth Logo	PRD 2.0	Yes	Yes
Laser/LED	EN60825-1	Yes	Yes
	IEC60825-1	Yes	Yes
Dust and water-splash	IEC60529, Level IP64	Yes	Yes

Denotation

Yes ; Applicable

N/A ; Not applicable

Note:

The model with “Yes” is compliant with the standard when a request on the compliance is made by Casio local distributor.

Table 4.34 shows compliance with the relevant Chinese standards.

Table 4.34

Category	Standard / Requirement	DT-X30xx-xx-CN			
		G-10-CN	R-30-CN	GR-30-CN	GR-30C-CN
Safety	IEC60950-1 2 nd edition	Yes	Yes	Yes	Yes
	GB4943 (CCC)	Yes	Yes	Yes	Yes
EMI	GB9254 (CCC)	Yes	Yes	Yes	Yes
	GB17625.1 (CCC)	Yes	Yes	Yes	Yes
SRRC	2002-353	Yes	Yes	Yes	Yes
GSM	YD/T 1214-2006 & YD/T 1215-2006	Yes	N/A	Yes	Yes
Bluetooth Logo	PRD 2.0	Yes	Yes	Yes	Yes
Laser/LED	IEC60825-1	Yes	Yes	Yes	Yes
Environment	IEC60529, Level IP64	Yes	Yes	Yes	Yes

Denotation

Yes ; Applicable

N/A ; Not applicable

Note:

The model with “Yes” is compliant with the standard when a request for the compliance is made by Casio local distributor.

4.5.2 HA-G60IO

Table 4.35 explains about compliance with the relevant regulatory standards and requirements for the USB Cradles (HA-G60IO, HA-G60IO-CN).

Table 4.35

Category	Standard / Requirement	Remark
EMC	CFR 47 Part 15 Subpart B	- USA
	ICES003	- Canada
	EN55022, EN55024	- EU
	EN61000-3-2, EN61000-3-3	- EU

4.5.3 HA-G62IO

Table 4.36 explains about compliance with the relevant regulatory standards and requirements for the Ethernet Cradles (HA-G62IO, HA-G62IO-CN).

Table 4.36

Category	Standard / Requirement	Remark
EMC	CFR 47 Part 15 Subpart B	- USA
	EN55022, EN55024	- EU
	EN61000-3-2, EN61000-3-3	- EU

4.5.4 HA-G30CHG

Table 4.37 explains about compliance with the relevant regulatory standards and requirements for the Cradle-type Battery Chargers (HA-G30CHG, HA-G30CHG-CN).

Table 4.37

Category	Standard / Requirement	Remark
EMC	CFR 47 Part 15 Subpart B	- USA
	EN55022, EN55024	- EU
	EN61000-3-2, EN61000-3-3	- EU

4.5.5 HA-G35CHG

Table 4.38 explains about compliance with the relevant regulatory standards and requirements for the Car Mounted-type Battery Chargers (HA-G35CHG, HA-G35CHG-CN).

Table 4.38

Category	Standard / Requirement	Remark
EMC	CFR 47 Part 15 Subpart B	- USA
	EN55022, EN55024	- EU

4.5.6 HA-G32DCHG

Table 4.39 explains about compliance with the relevant regulatory standards and requirements for the Dual Battery Chargers (HA-G32DCHG, HA-G32DCHG-CN).

Table 4.39

Category	Standard / Requirement	Remark
EMC	CFR 47 Part 15 Subpart B	- USA
	EN55022, EN55024	- EU
	EN61000-3-2, EN61000-3-3	- EU

4.5.7 HA-G20BAT

Table 4.40 explains about compliance with applicable requirements for the Battery Packs (HA-G20BAT, HA-G20BAT-CN).

Table 4.40

Category	Standard / Requirement	Remark
EMC	EN55022	- EU
	EN55024	- EU
	EN61000-3-2	- EU
	EN61000-3-3	- EU
Safety	UL2054	- USA
	UL60950-1	- USA

4.5.8 AD-S42120B

Table 4.41 explains about compliance with the relevant regulatory standards and requirements for the AC Adaptors (AD-S42120B, AD-S42120B-CN).

Table 4.41

Category	Standard / Requirement	Remark
EMC	UL60950 3 rd edition	- USA
	CAN/CSA C222 NO.60950-00 1 st edition	- Canada
	EN60950-1:2001+A11	- EU
	AS/NZS60950-1:2000	- Australia, New Zealand
	IEC60950-1:2001	- CB certificate
	K60950-1	- Korea
	CNS14336 (94)	- Taiwan
	GB4943-2001	- China
Safety	CFR47 FCC Part 15 Subpart B	- USA, Canada
	EN55022:2006	- EU
	EN55024:1998+A1:2001+A2:2003	- EU
	EN61000-3-2:2000+A2:2005	- EU
	EN61000-3-3:1995+A1:2001+A2:2005	- EU
	GB9254-1998	- China
	GB17625.1-2003	- China
	CNS13438 (95)	- Taiwan
	AZ/NZS CISPR22	- Australia, New Zealand