DT-X11 Series

Hardware Manual

(Version 1.01)

CASIO Computer Co., Ltd.

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Editorial Record

Manual Version no.	Date edited	Page	Content
0.90	February 2006		Tentative version
1.00	March 2006		Original version
1.01	August	8	The content in Table 1.2 of Chapter 1.2 is corrected.
		26	The content in Table 2.9 of Chapter 2.7 is corrected.

Preface

This reference manual describes about the CASIO DT-X11 series handheld terminals with C-MOS imager or Laser Scanner integrated.

A new generation of handheld terminal has been developed. CASIO introduces the revolutionary DT-X11 series of handheld terminal with built-in Intel® PXA255 Application Processor, C-MOS imager or 1D bar code scan engine and diverse wireless LAN communications via Bluetooth, IEEE802.11b WLAN and WAN card.
Running under Microsoft® Windows® CE 5.0 operating system, the rugged DT-X11 is designed specifically with the transportation/delivery and logistics in mind.

In this reference manual, the DT-X11 series is described as “DT-X11” or “the terminal” or “handheld terminal”.

1. Overview of the Products

1.1 Features

Incorporates .NET technology

- Uses WindowsCE 5.0 operating system.
- Makes effective use of .NET resources developed by other corporations.
- Employment of eMbedded OS makes it possible to build a flexible WindowsCE system.

Enhanced communicating functions

- Covers GPRS/WLAN, etc. by using various communication cards.
- Built with Bluetooth® Ver1.2 module.
- The transfer rate of the WLAN is 5 Mbps, which is the maximum rate of communication for peer-to-peer connection with PC via IEEE802.11b.
- The following protocol stacks are available for Bluetooth® interface: GAP (Generic Access), SDP (Service Discovery), SPS (Serial Port), Dialup Network, File Transfer.
- Security function (PEAP EAP-MS-CHAP V2, EAP-TLS, MD5+WEP128)

Superb scanning capability (DT-X11M10E/DT-X11M10RC)

- With the installed bar code scan engine it is possible to read industrial standard bar code symbologies.
- Scanning performance is comparable to the CASIO IT-500 series handheld terminal.
- Multi-step bar code read function.

Superb scanning capability (DT-X11M30E/DT-X11M30U/DT-X11M30RC)

- With the installed C-MOS imager it is possible to read 2D symbologies/1D symbologies/OCR fonts and to capture images.
- Image capturing function (2 to 256 monochromatic tones).
- Scanning performance on 1D bar code symbology is comparable to the CASIO DT-800 series handheld terminal.
- Multi-step bar code read function.

Support of outstanding development environment

Ample Microsoft development tools provided for easy application development and an advanced debug environment.

- Visual Studio 2005
- Visual Studio.NET 2003 (WindowsCE .NET Utilities v 1.1 for Visual Studio .NET 2003)
- eMbedded Visual C++ 4.0

High expandability

The standard PCMCIA slot makes it possible to use various standard peripheral cards.

Aiming to a full compliance with the "Restriction of the use of certain Hazardous Substances in electronic equipment (RoHS)" set mandatory on July 1 2006

The following products have been assembled with devices, components and parts manufactured using Lead (Pb) free solder.

- DT-X11M10E
- DT-X11M10RC
- DT-X11M30E
- DT-X11M30U
- DT-X11M30RC

1.2 Available Models

Table 1.1 List of models

Model	Scan Engine	Wireless Communication		PC Card slot	Memory	
		Bluetooth	IEE802.11b		RAM	FROM
DT-X11M10E	Laser Scanner	Yes	Yes	Yes	64MB	128MB
DT-X11M10RC	Laser Scanner	Yes	No	No	64MB	128MB
DT-X11M30E	C-MOS Imager	Yes	Yes	Yes	64MB	128MB
DT-X11M30U	C-MOS Imager	Yes	Yes	Yes	64MB	128MB
DT-X11M30RC	C-MOS Imager	Yes	No	No	64MB	128MB

Table 1.2 Options

Model	Product	Remark
DT-160IOE	Bridge Satellite Cradle	
DT-169CHGE	Cradle-type battery charger	
DT-891WH	Wall-mount Unit	
DT-167CHGE	Car Mounted Battery Charger	
DT-827CAC	Car Power Cable	Not marketable in the USA/Canada
DT-5022CHG	Dual battery charger	
AD-S45150AU	AC adaptor	AC input 100 to 230VAC. With US power cord. For DT-5022CHG
AD-S45150AE		AC input 100 to 230VAC. With European power cord. For DT-5022CHG
AD-S42120AE		AC input 100 to 230VAC. For DT-160IOE/DT-169CHGE
HA-A20BAT	Battery pack (Standard)	Lithium-ion rechargeable battery 1,700 mAh
DT-5025LBAT	Large-capacity battery pack	Lithium-ion rechargeable battery 3,400 mAh
DT-894CFU	CF Card Extension Unit	CF Type I/ Type II. The large-size card cover comes as standard
DT-892TCV	Communication Card Cover	For standard-size card
DT-893LTCV		For large-size card
DT-882RSC	RS-232C Cable	25-pin male
DT-883RSC		25-pin female
DT-887AXA		Length; 1.5 m, 9-pin female
DT-888RSC	RS-422 Cable	Length; 1.0 m
DT-380USB	USB Cable	Length; 2.0 m

Table 1.3 Accessories

Name	Q'ty	Remark
User's guide	1	In English and Chinese (in simplified Chinese characters)
Stylus	1	
Large-capacity battery pack cover	1	Required when DT-5025LBAT is installed.
Wrist strap	1	
PC Card Remover	2	

1.2.1 Options and Interfaces

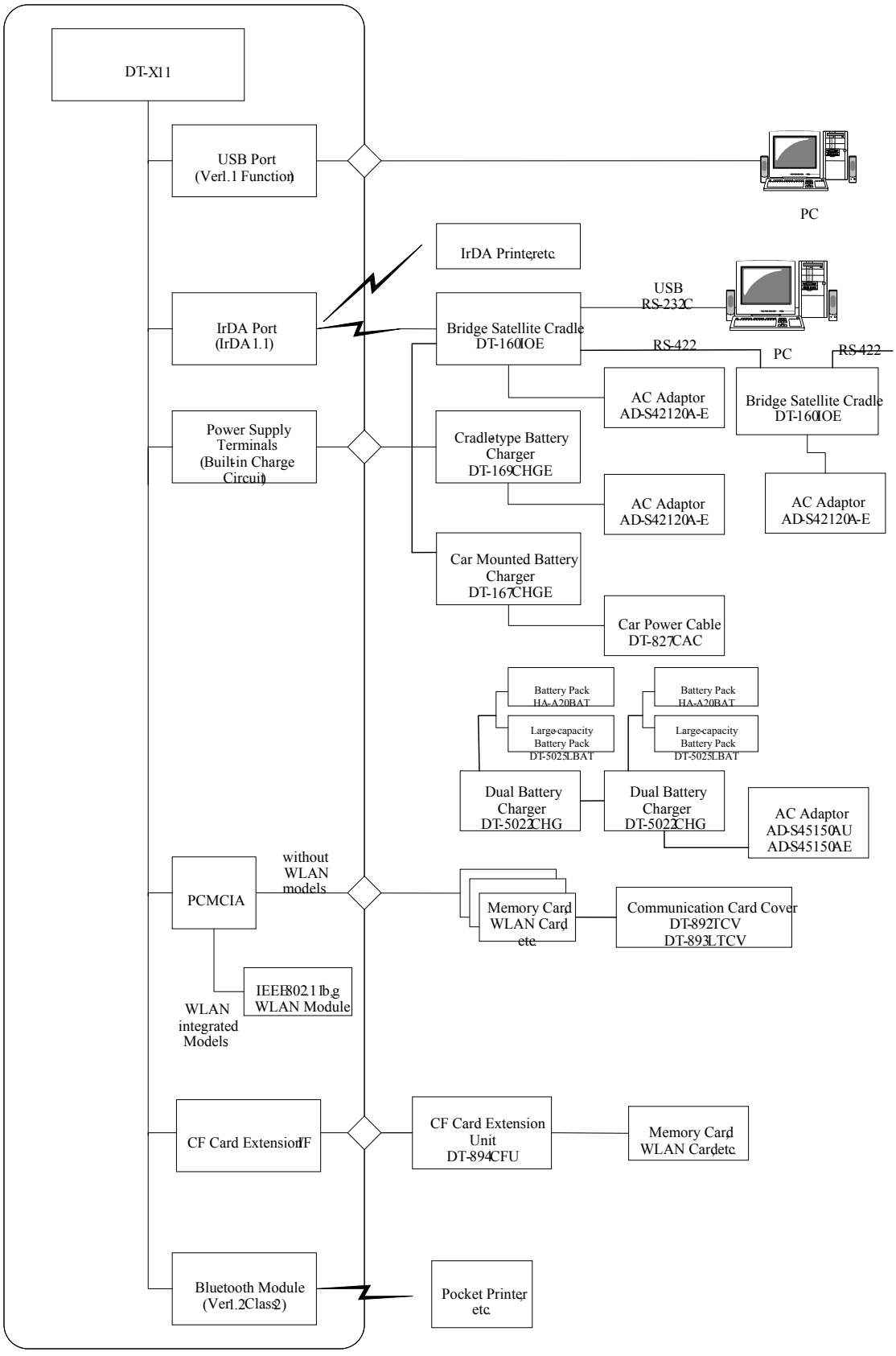


Fig. 1.1

1.3 General Guide

1.3.1 DT-X11

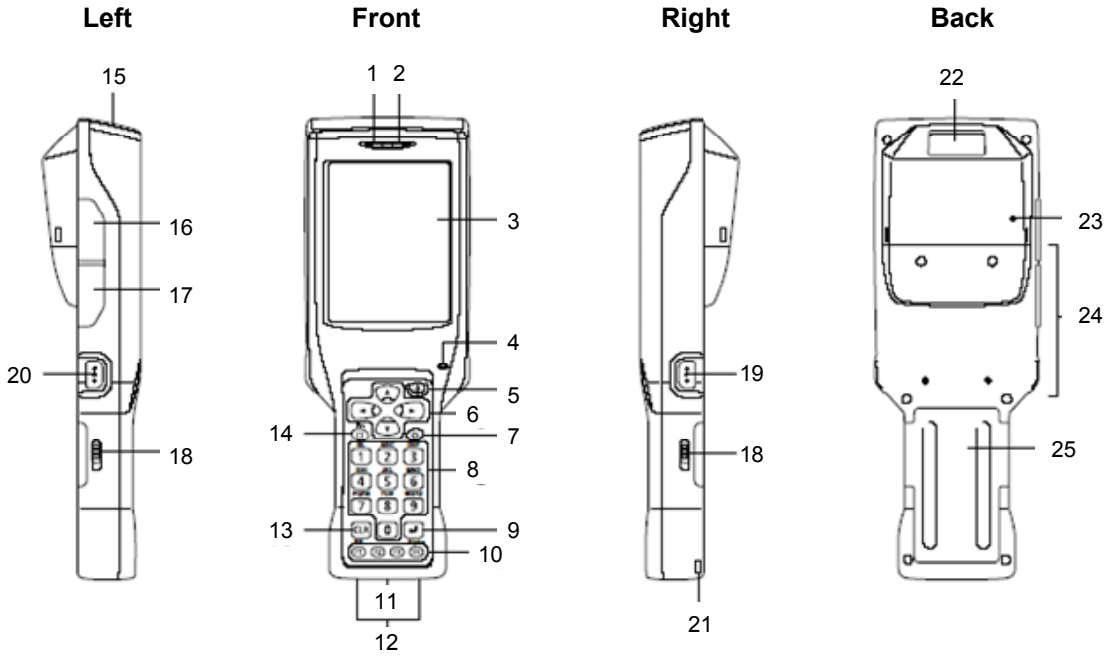


Fig. 1.2

Table 1.4 Names of parts

No.	Name	Description
1	Indicator 1	Indicates the result of a bar code reading or other read operation. Red : Read error Green : Read successful
2	Indicator 2	This lamp indicates the charge status of the battery pack. Red : Charging Green : Charging complete
3	LCD Panel/Touch Screen	Shows text, operation indicators, etc. Also, operations can be performed and text can be input using the supplied stylus.
4	Buzzer	Sounds a buzzer.
5	Power Key	Hold down for about one second to turn the power on or off.
6	Cursor Keys	These keys operate much like a computer's cursor keys. They can be used to select items, scroll screen contents, etc.
7	Programmable Key	This key can be assigned with any function available.
8	Numeric Keys	Use these keys to input numbers and letters.
9	Execute Key	Press to register an input value and advance to the next step.

Continue.

10	Function Keys	These keys can be assigned any function other than barcode reading. The following are the initial default settings. F1 : Deletes one character to the left. F2 : Inputs a hyphen (-). F3 : Inputs a period (.). F4 : Toggles to switch between numbers and alphabets.
11	IR Port	This port is used for IR communication with another Handheld Terminal or Bridge Satellite Cradle.
12	Power Contacts	Contact point for supplying power from Bridge Satellite Cradle and Cradle-type Battery Charger.
13	CLR Key	Press to clear all key inputs.
14	Fn Key	Press this key and then a function key or number key to configure settings or to run previously registered applications.
15	PC Card Slot	For insertion of a separately available PC card.
16	USB Port	For connection to a computer or other device using a USB cable.
17	Headset Jack	For connection of a commercially available headset (2.5mm).
18	Battery Pack Cover Lock Switches	Slide these switches to lock and release the battery pack cover.
19	R Trigger Key	Press to perform a code read operation. This is also pressed to perform a full reset.
20	L Trigger Key	Press to perform a code read operation. This is also pressed to cancel a full reset.
21	Wrist Strap Hole	Connect the wrist strap here.
22	C-MOS Imager (C-MOS Imager models only)	Reads 1D bar codes and 2D codes.
	Reader Port (Laser Scanner models only)	Reads 1D bar codes.
23	Reset Switch	Press to reset the Handheld Terminal.
24	CF Card Slot Unit Terminal	For connection of a separately available CF Card Extension Unit.
25	Battery Pack Cover	Covers the compartment that holds the battery pack.

1.3.2 DT-167CHGE Car Mounted Battery Charger

Views

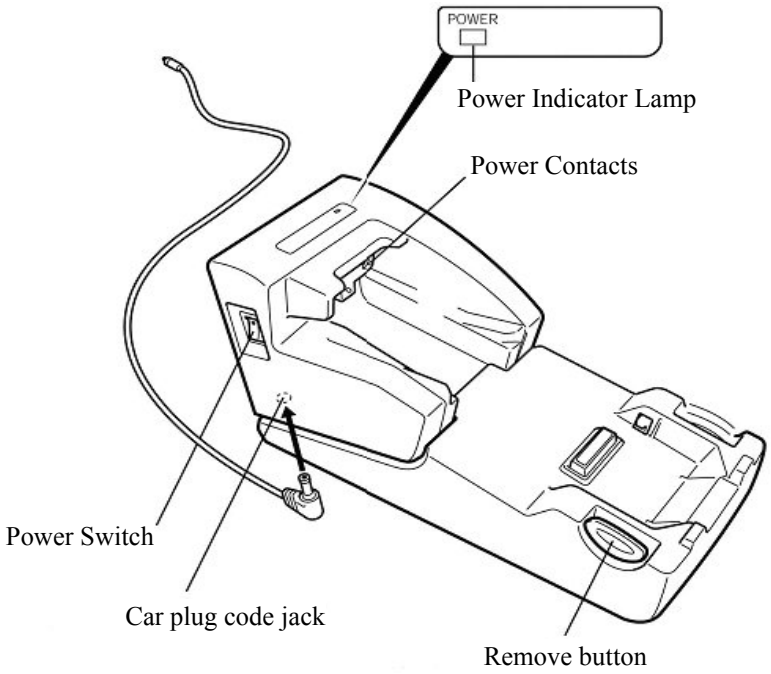


Fig. 1.3

1.3.3 DT-160IOE Bridge Satellite Cradle

The following external views show the DT-160IOE Bridge Satellite Cradle. Refer to Table 1.5 for each referenced part on the DT-160IOE.

Views

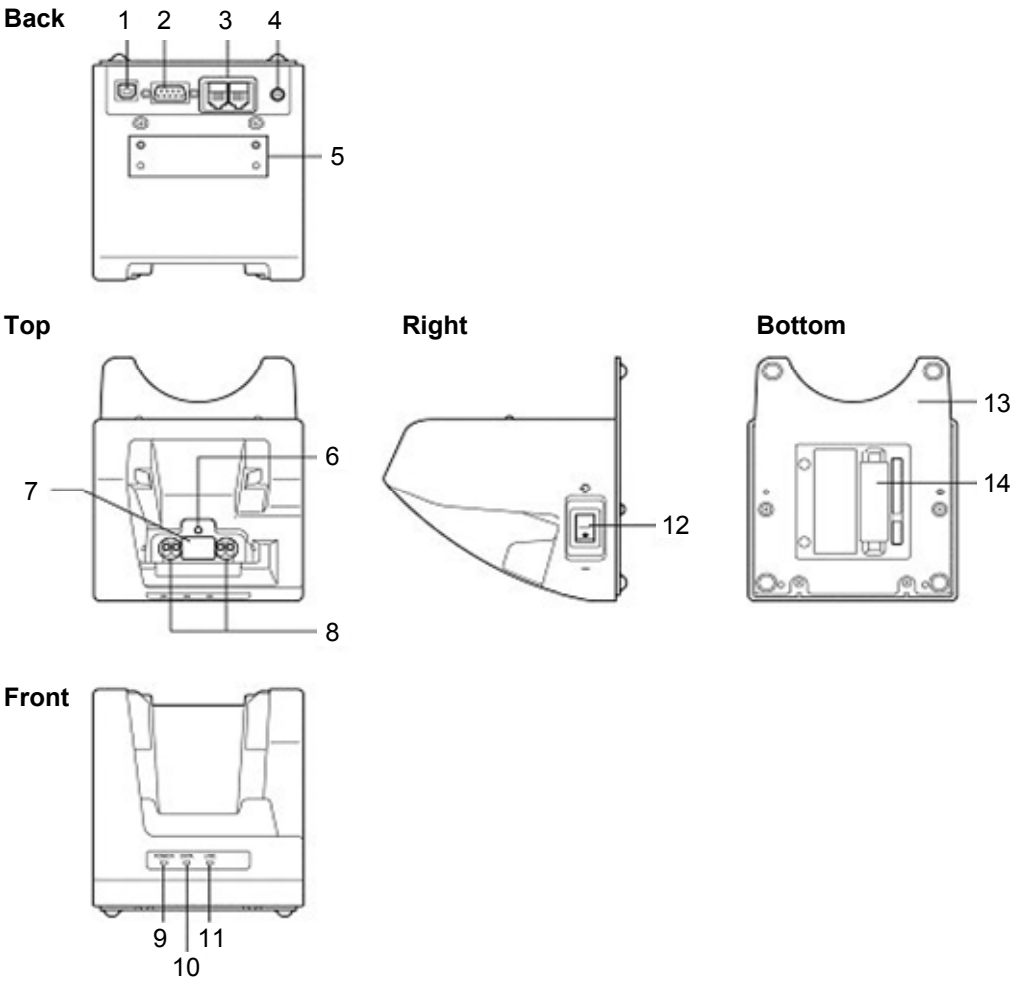


Fig 1.1

Table 1.5 Names of parts

No.	Name	Description
1	USB Port	This port accepts connection of a USB cable for connection to a computer for transfer of system data and file data. Use of the USB port requires installation of a special driver on the PC.
2	RS-232C Port	This port accepts connection of an RS-232C cable for connection to a computer for transfer of system data and file data. Use of the RS-232C port requires installation of a special driver on the PC.
3	RS-422C Port	This port is used when connecting to another Bridge Satellite Cradle.
4	AC Adaptor Jack	Connect the AC adaptor here.

Continue.

No.	Name	Description
5	Wall Mount Unit Fastening Plate	The holes in this plate accept screws that secure the wall mount unit in place.
6	Terminal Detect Switch	This switch detects when the Handheld Terminal is not seated correctly on the Bridge Satellite Cradle.
7	IR Port	This port transfers data to the Handheld Terminal via IR port.
8	Power Contacts	Power is supplied to the Handheld Terminal via these contacts.
9	Power Indicator Lamp	This lamp indicates the power status and the mounting status of the Handheld Terminal. Off : Power off Green : Power on, Handheld Terminal mounted correctly Red : Power on, Handheld Terminal not mounted
10	Communication Indicator Lamp	This lamp shows when the Handheld Terminal is performing data communication. Off : No data communication being performed. Green flashing : Data communication in progress. Red : Problem with a connection between two Bridge Satellite Cradles.
11	System Status Indicator Lamp	This lamp indicates whether the system is operating normally. Regardless of whether or not a Handheld Terminal is mounted this lamp indicates the system status and whether or not a communication operation with the system can be performed. Off : System is not operating. Green : System is operating.
12	Power Switch	Turns the power on and off.
13	Desktop Unit	This is the base when using the Bridge Satellite Cradle in a desktop configuration. Remove the desktop unit in the case of a wall-mount configuration.
14	DIP Switches	Use these switches to configure the Bridge Satellite Cradle as required.

1.3.4 DT-169CHGE Cradle-type Battery Charger

The following external views show the DT-169CHGE (Cradle-type Battery Charger). Refer to Table 1.6 for each referenced part on the DT-169CHGE.

Views

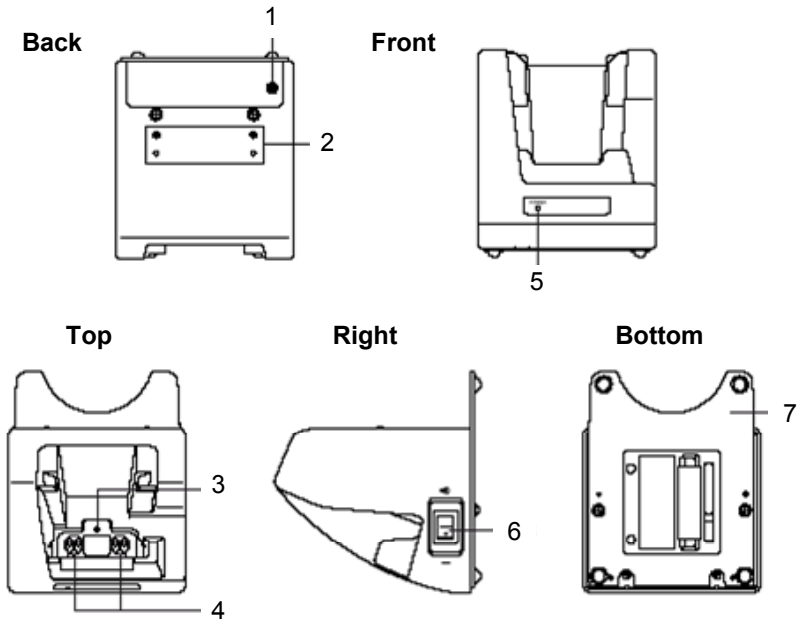


Fig 1.2

Table 1.6 Names of parts

No.	Name	Description
1	AC Adaptor Jack	Connects the AC adaptor here.
2	Wall Mount Unit Fastening Plate	The holes in this plate accept screws that secure the wall mount unit in place.
3	Terminal Detect Switch	This switch detects when the Handled Terminal is not seated correctly on the Cradle.
4	Power Contact	Power is supplied to the Handheld Terminal via these contacts.
5	Power Indicator Lamp	This lamp indicates the power status and the mounting status of the Handheld Terminal. Off : Power off Red : Power on, Handheld Terminal not mounted Green : Power on, Handheld Terminal mounted correctly
6	Power Switch	Turns the power on and off.
7	Desktop Unit	This is the base when using the Cradle in a desktop configuration. Remove the desktop unit in the case of a wall mount configuration.

1.3.5 DT-5022CHG Dual Battery Charger

The following external views show the DT-5022CHG (Dual Battery Charger). Refer to Table 1.7 for each referenced part on the DT-5022CHG.

Views

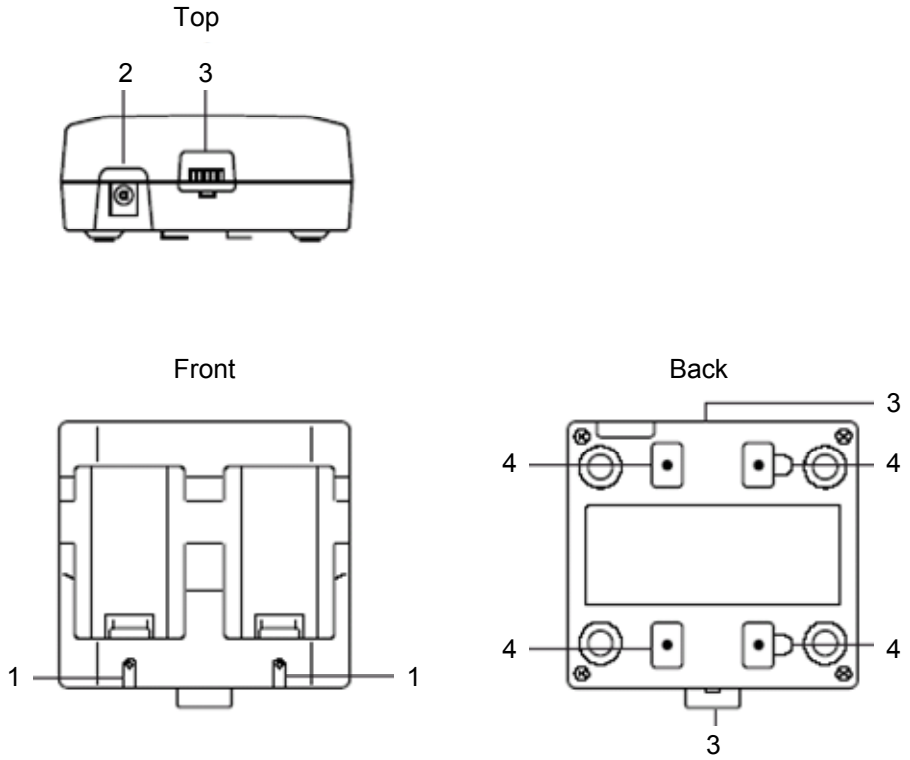


Fig 1.3

Table 1.7 Names of parts

No.	Name	Description
1	Charge Indicator Lamp	This lamp indicates the charge status of the battery pack(s). Off : Not charging Red : Charging Red Flashing : Battery pack problem Green : Charging complete
2	AC Adaptor Jack	Connects the AC adaptor here.
3	Dual Battery Charger Connection Port	Use this port to connect multiple Dual Battery Chargers to each other.
4	Connection Bracket Attachment Holes	The connection bracket attaches here when you connect multiple Dual Battery Chargers to each other.

Notes:

Each Dual Battery Charger comes with one connection bracket. Since only one connection bracket is required when you connect two Dual Battery Chargers, you will always have one left over. Simply keep the other connection bracket on hand as an extra, in case you ever need it.

2. Hardware Specifications

2.1 DT-X11

Table 2.1

Item		Specification	Remark
CPU, Memory			
	CPU	Intel® PXA255 Application Processor	Operating clock; max 400 MHz
	RAM	64 MB	
	FROM	128 MB (user area; approx. 115 MB)	FlashFX built in.
OS		Microsoft® Windows® CE 5.0 operating system	
C-MOS Imager (DT-X11M30E, DT-X11M30U, and DT-X11M30RC)			
	Method	C-MOS Imager, 752 x 480 (Wide VGA), monochrome	
	Emitting angle	Redirected downward at 45 degree	
	Resolution	1D : 0.15mm 2D Stacked : 0.169mm 2D Matrix : 0.33mm Composite : 0.33mm	
	PCS	1D : 0.45 (minimum) 2D : 0.45 (minimum)	Print contrast signal
	Readable distance (Resolution = 1.0mm)	1D : Approx. 40 to 410 mm 2D Stacked : Approx. 50 to 250 mm 2D Matrix : Approx. 60 to 130 mm	
	Readable width	Max. 29 mm	When the distance is at 40 mm.
		Max. 265 mm	When the distance is at 365 mm.
	Focal distance	4.5inch	
	Readable 1D symbologies	EAN8/JAN8, EAN13/JAN12, UPC-A, UPC-E, Code39, Codabar (NW7), Interleaved 2of5(ITF), Code93, Code128(EAN128), MSI(Plessey), IATA, Code11, RSS-14, RSS Limited, RSS Expanded, ISBT	
	Readable 2D stacked code symbologies	Code49, PDF417, Micro PDF, Codablock F, EAN8/13 Composite, TLC39,UCC/EAN128 Composite, RSS-14(Stacked type), RSS Expanded(Stacked type), RSS Composite	
	Readable 2D Matrix code symbologies	Aztec, DataMatrix, Maxicode, QR Code	

Continue.

Laser Scanner (DT-X11M10E and DT-X11M10RC)			
	Method	Semi-conductor laser light	
	Laser emitting angle	Straight	
	Wave length	650±10 nm	
	Optical output	<1 mW	
	No. of scannings	100±20 times per second	
	Resolution	0.127 mm (minimum)	
	PCS	0.45 (minimum)	Print contrast signal
	Readable distance	Approximately 40 to 300 mm	
	Readable width	Max. 40 mm	When the distance is at 40 mm.
		Max. 238 mm	When the distance is at 300 mm.
	Daylight for scanning	50,000 Lux or less	
	Readable 1D bar code symbologies	EAN8/JAN8, EAN13/JAN13, UPCA, UPCE, Code39, Codabar(NW7), Interleaved 2of5(ITF), Code93, Code128(EAN128), MSI(Plessey), IATA, Industrial 2of5(IDF), RSS-14, RSS Limited, RSS Expanded	
Display			
	Display device	3.5-inch 2-Way TFT color LCD	
	No. of dots	240 (h) x 320 (w)	
	Dot pitch	0.22 (h) x 0.22 (w) mm	
	Display font	Scalable font	See note 1
	Backlight	LED	
Indicator			
	Confirmation /Status	LED x 2 pcs in red/green	Left: Programmable Right: Battery charge status
Input			
	Keyboard	Numeric (Alphabet) keys, CLR key, Execute key, Fn key, Text key, Cursor key	
	Control keys	Power ON/OFF key, Reset switch	
	Trigger keys	2 keys (on the left and right sides)	
	Touch panel	Plastic panel (Resolution 240 x 320) Possible to display character input pad	
IrDA interface			
	Standard	IrDA ver.1.1 compatible	
	Communication process	Half duplex	
	Synchronization	Start/Stop bits	
	Baud rate (in bps)	9,600/115,200/4M	
	Communication range	0 (contact) to 1m	Max. 0.25m at 4Mbps

Continue.

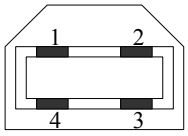
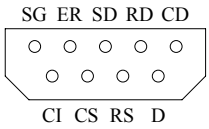
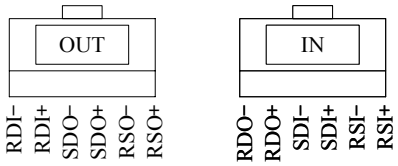
Bluetooth®			
	Standard	Bluetooth® Specification Ver.1.2	
	Comm. range	Approx. 3 m	Depending on the surrounding conditions
	Output power	Maximum. 3dBm (PowerClass 2)	
Serial interface			
	Standard	USB Slave	Mini B 5 Pin.
	Baud rate	Full speed (12 Mbps)	
Audio		Earphone jack φ2.5mm 3-pole	Supports headset.
PC Card (applicable to DT-X11M10E, DT-X11M30E, and DT-X11M30U)			
	Standard	PC Card Type I / Type II	3.3V/5.5V
	Supply current	450mA(5V), 500mA(3.3V)	Constant supply current values
WLAN (applicable to DT-X11M10RC and DT-X11M30RC)			
	Frequency category	ISM	
	Standard	IEEE802.11b	See note 2
	Modulation	Direct Sequence Spread Spectrum	
	Frequency band	2.400 to 2.4835 GHz	
	Baud rate	11 Mbps (maximum)	
	Comm. range	50 m (indoor) to 150 m (outdoor)	The range may vary depending on the environment.
	Number of channels	13	Three channels are available at the same time.
	Other feature	Roaming between Access-Points	
WLAN card (applicable to DT-X11M10E, DT-X11M30E and DT-X11M30U)			
	Card type	CF card Types I/II (3.3V)	CF Card Extension Unit (option)
	Supply current	300 mA (3.3V) maximum	
Power			
	Operation	Lithium-ion battery pack	HA-A20BAT or DT-5025LBAT
	Memory backup	Lithium battery (rechargeable) on board	Built-in, not replaceable 50mAH
	Operating period (hours)	DT-X11M10E/M30E/M30U	DT-X11M10RC/30RC
		Approx. 8 (with HA-A20BAT)*3 Approx. 18 (with DT-5025LBAT)*3	Approx. 4 (with HA-A20BAT)*4 Approx. 10 (with DT-5025LBAT)*4
	Memory back up period	RAM : Approx. 10 minutes Clock : Approx. 2 weeks	- Lithium battery pack is fully charged. - At room temperature.
	Memory backup battery charge period	Approximately 4 days	- Time period until when the battery is fully charged. - Battery pack is being installed. - At room temperature.
	Buzzer	Sound pressure 70dB (minimum)	

Notes:

1. A font that can be used to print characters in any size.
2. Concurrent use of WLAN communication with Bluetooth communication is not recommended.
3. Based on the operating cyclic ratio of “standby:calculation:scan” at 20:1:1
4. Based on the operating cyclic ratio of “standby:scan:wireless” at 6.5:1.5:2.

2.2 DT-160IOE Bridge Satellite Cradle

Table 2.2

Item			Specification	Remark
Interface	IrDA	Standard	IrDA Ver. 1.1 compatible	
		Comm. method	Half duplex	
		Synchronization	Start/stop method	
		Comm. speed	4 Mbps (maximum)	
	USB	Standard	USB Ver.1.1 compatible	
		Baud rate	12 Mbps (maximum)	
		Connector	 USB connector B type	1 VBus 2 – Data (D -) 3 + Data (D+) 4 GND
	RS-232C	Comm. method	Full duplex	
		Synchronization	Start/stop method	
		Comm. speed	115.2 Kbps	
		Connector	 D-Sub 9-pin(Male)	1 VBus 2 – Data (D -) 3 + Data (D+) 4 GND
	RS-422	Comm. method	Full duplex	
		Synchronization	Start/stop method	
		Comm. speed	115.2 Kbps	
		Connector	 RJ-45 compatible (6 pins)	
Display	Status LED	No. of LEDs	3	
		No. of display colors	2	Red, green
		Display content	System operation status (“LINE”) Communication status (“DATA”) Power status (“POWER”)	Refer to Chapter 2.6 “Status Indication with LEDs”.
Input	Dip switch		8 switches	See page 24.
	Detection switch for DT-X11 terminal		Push switch	

Continue.

Power	Input from AC adaptor	Input voltage	DC 12V ±5%	
		Consumption current	Approx. 1,600 mA	When supplying power or transmitting data.
		Plug	EIAJ RC-5320A type 4	Center; Plus
		AC adaptor	AD-S42120AE	
	Charge/ supply power	Output voltage	DC 5V ±10%	
		Output current	2,500mA(maximum)	
		Charge method	Constant voltage	With curb function on current
		Charge time	Approx. 2.5 hours	For HA-A20BAT
			Approx. 5.0 hours	For DT-5025LBAT
		Power supply terminals	 Power supply terminals GND	The illustration of the power supply terminals on the left is viewed at the front of the cradle.

Table 2.3 Weight / Dimensions

		Specification	Remark
Weight	In desktop configuration	Approx. 490 g	
	In wall-mount configuration	Approx. 650 g	
Dimensions	In desktop configuration	Approx. 110 (W) x 139 (D) x 129 (H) mm	
	In wall-mount configuration	Approx. 110 (W) x 148 (D) x 153 (H) mm	

2.3 DT-167CHGE Car Mounted Battery Charger

Table 2.4

Item			Specification	Remark
Display	Status LED	No. of LEDs	1	
		No. of display colors	2	In red and green
		Display content	Power status (“POWER”)	
		Indicates the status of terminal being mounted on the charger. OFF : Power is OFF. Flashing in green : Power is ON and the terminal is mounted on the charger. Flashing in red : Power is ON but the terminal is not mounted on the charger.		
Input	Detection switch for DT-X11 terminal		Push switch	
Power	Input from power adaptor	Input voltage	DC 12V/24V±5%	
		Consumption current	DC 12V: Approx. 1,400 mA	While supplying power.
			DC 24V: Approx. 700 mA	
		Plug	EIAJ RC-5320A Class 4	Center: plus
		Power cord	DT-827CAC	
	Charge/supply power	Output voltage	DC 5V±10%	
		Output current	2,500 mA (maximum)	
		Charge method	Constant voltage	With curb function on current
		Charge time	Approx. 2.5 hours	For HA-A20BAT
			Approx. 5.0 hours	For DT-5025LBAT
		Power supply terminals	 Power supply terminals GND	The illustration of the power supply terminals on the left is viewed at the front of the charger.

Table 2.5 Weight/Dimensions

	Specification	Remark
Weight	Approx. 755 g	
Dimensions	Approx. 119 (W) x 267 (D) x 123 (H) mm	

2.4 DT-169CHGE Cradle-type Battery Charger

Table 2.6

Item			Specification	Remark
Display	Status LED	No. of LEDs	1	
		No. of display colors	2	In red and green
		Display content	Power status (“POWER”)	
Input	Detection switch for DT-X11 terminal		Push switch	
Power	Input from AC adaptor	Input voltage	DC 12V±5%	
		Consumption current	Approx. 1,400 mA	While supplying power or transmitting data.
		Plug	EIAJ RC-5320A Class 4	Center: plus
		AC adaptor	AD-S42120AE	
	Charge/Power supply	Output voltage	DC5V±10%	
		Output current	2,500 mA (maximum)	
		Charge method	Constant voltage	With current curb function
		Charge time	Approx. 2.5 hours	For HA-A20BAT
			Approx. 5.0 hours	For DT-5025LBAT
		Power supply terminal	 Power supply terminals GND	The illustration of the power supply terminals on the left is viewed at the front of the charger.

Table 2.7 Weight/Dimensions

		Specification	Remark
Weight	In desktop configuration	Approx. 470 g	
	In wall-mount configuration	Approx. 630 g	
Dimensions	In desktop configuration	Approx. 110 (W) x 139 (D) x 129 (H) mm	
	In wall-mount configuration	Approx. 110 (W) x 148 (D) x 153 (H) mm	

2.5 DIP Switch Setting for DT-160IOE

The DIP switch is located on the rear side of Bridge Satellite Cradle. Change the ON/OFF settings according to your required system configuration. The new settings do not go into effect until the power switch is turned off and then back on.

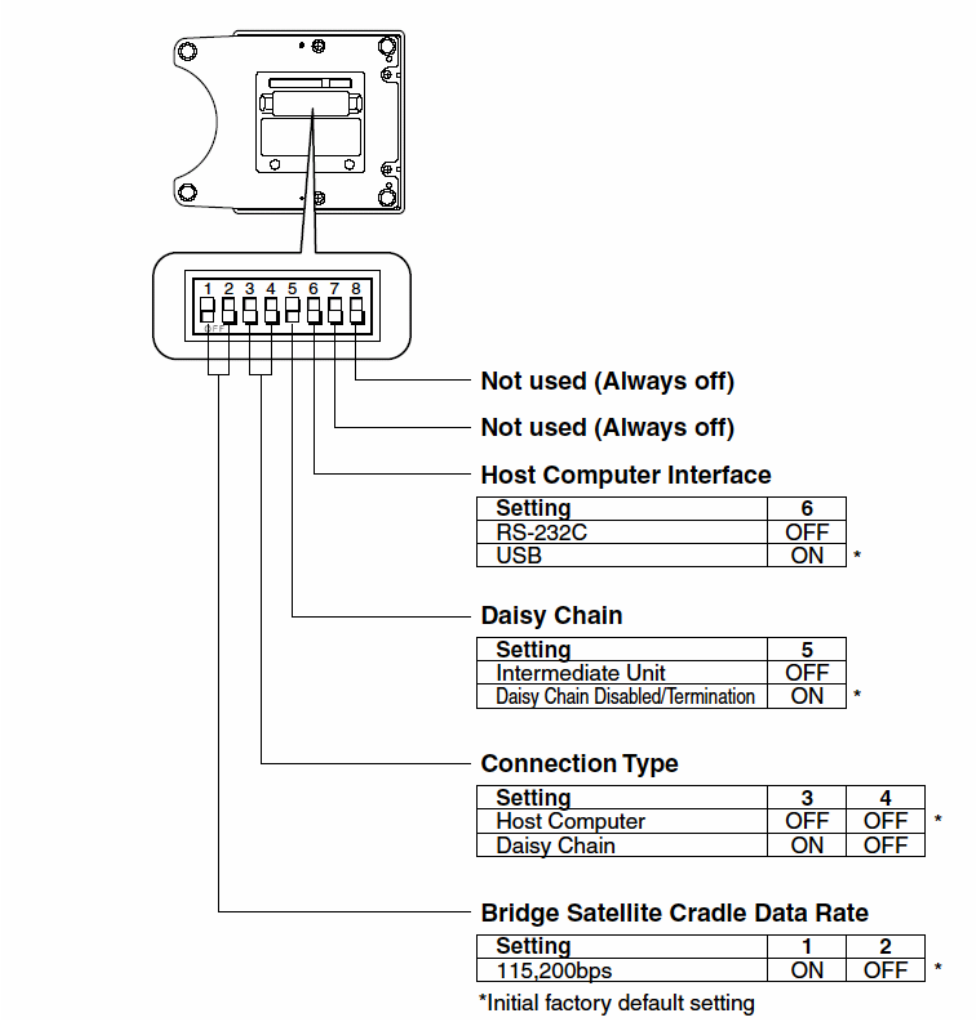


Fig. 2.1

Note:
Other DIP switch settings are used for testing and inspection purposes Because of this, you must not use any DIP settings other than those described above.

2.6 Status Indication with LEDs

Various operational statuses on the DT-160IOE can be displayed using the LEDs. The following table describes LED modes and their meanings.

Table 2.8

Item			Specification	Remark
LED				
	Power status indicator ("POWER")	DT-X11 terminal is not mounted	LED ON in red	2-color LED
		DT-X11 terminal is mounted	LED ON in green	
		Power OFF	LED OFF	
	Comm. status indicator ("DATA")	Break of communication	LED OFF	2-color LED
		Communication is in progress	LED flash in green	
		Connection between cradle and PC is not valid.	LED ON in red	
	Line status indicator ("LINE")	No communication with DT-X11 or abnormality of the system	LED OFF	2-color LED
		Communication with DT-X11 is in progress.	LED ON in green	

2.7 DT-5022CHG Dual Battery Charger

Basic Block

Table 2.9

Item			Specification	Remark
Basic function				
	Rechargeable battery pack			
		HA-A20BAT	Battery pack	Dedicated batteries only.
		DT-5025LBAT	Large-capacity battery pack	
	AC adaptor			
		AD-S45150AU	Input 100 to 230VAC (W/US power cord)	Dedicated AC adaptors for the charger
		AD-S45150AE	Input 100 to 230VAC (W/European power cord)	

Interface Block

Table 2.10

Item		Specification	Remark
Input terminals for joint block			
	1: VIN2	Rated DC16V Input voltage 8 to 20	
	2: VIN3	Rated DC16V Input voltage 8 to 20	
	3: NC	NC	
	4: GND	GND	
Output terminals for joint block			
	1: VOUT1	DC16V	Output terminal from 1st unit when AC adaptor is used.
	2: VOUT2	DC16V	Output terminal from 2nd unit
	3: NC	NC	
	4: GND	GND	
No. of joint-able units		3 units (x DT-5022CHG)	

Power Supply Block

Table 2.11

Item		Specification	Remark
Input			
	Rated voltage	DC 16V	
	Input voltage	DC 8.0 to 20V	
Rated output			
	Rated output voltage	DC 4.22V	
	Rated output current	DC 1,600 mA	
Input consumption current			
	Input consumption current	0.65 A	When input voltage is at 16V.

Continue.

Charge output terminal CH1			
	PIN1: +	4.22V±30mV	
	PIN2: -	GND	
Charge output terminal CH2			
	PIN1: +	4.22V±30mV	
	PIN2: -	GND	
Input terminal			
	DC jack	Rated DC16V, input voltage DC 8.0 to 20.0V	

Battery Charge Block

Table 2.12

Item			Specification	Remark
Charge control				
Output voltage			DC 4.22V±30mV	
Charge current (standard mode)			DC 1,600mA±10%	
Charge current (standby mode)			DC 160±40mA	
Full charge detection current			DC 120±30mA	
Voltage control	Full charge detection voltage		4.1V	
	Re-charge detection voltage		4.0V	
Re-charge detection voltage			DC 4.0±0.1V	
Input voltage			DC 8.0 to 20V	
Timer				
Charge timer (standby mode)			90 minutes	
Charge timer (standard mode)			720 minutes	
Trickle charge timer			120 minutes	
Charge hour				
HA-A20BAT			Approx. 2.5 hours (for 1 pack) Approx. 5 hours (for 2 packs at same time)	At 0 to 40 ºC
DT-5025LBAT			Approx. 5 hours (for 1 pack) Approx. 10 hours (for 2 packs at same time)	At 0 to 40 ºC
Temperature control			Not available	
No. of charge output			1	
Operation mode				
Battery pack mount detection				
Battery pack not mounted			LED OFF, charge output OFF	
Battery pack mounted			LED ON in red, charge output OFF	
Check on battery pack			LED ON in red, charge output OFF	
Battery charge (standby mode)			LED ON in red, charge output ON	
Battery charge (standard mode)			LED ON in red, charge output ON	
Wait mode in trickle charge			LED ON in green, charge output OFF	
Charge in trickle mode			LED ON in green, charge output ON	
Charge completed			LED ON in green, charge output OFF	
Charge abnormal end			LED flash in red, charge output OFF	
Other				
Priority order of battery charging			Order in mounted order	

Table 2.13 Weight/Dimensions

Item	Specification	Remark
Weight	Approx. 154 g	
Dimensions	100 (L) x 110 (W) x 49 (H) mm	

2.8 HA-A20BAT/DT-5025LBAT

Table 2.14

Item	Specification		Remark
	HA-A20BAT	DT-5025LBAT	
Rated capacity	1,700 mAh	3,400 mAh	0.2C discharge
Rated voltage	3.7 V	3.7 V	0.2C discharge
Discharge end voltage	2.75V	2.75V	
Standard charge current	1.0 CA (=1.55A) 0 to 40 ℃	1.6A 0 to 50 ℃	
Charge voltage	4.2±0.05V	4.2±0.05V	
Charge hour (standard mode)	2.5	5.0	Charge with DT-5022CHG
Weight	Approx. 45 g	Approx. 87 g	
Dimensions	Approx. 37(W) x 57(L) x 13(H) mm	Approx. 37 (W) x 57 (L) x 24 (H) mm	

2.9 DT-894CFU CF Card Extension Unit

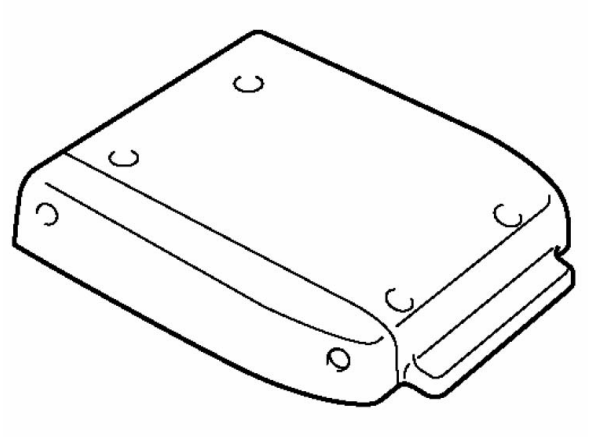


Fig. 2.2

Table 2.15 Dimensions/Weight

Item	Specification	Remark
Dimensions	Approx. 70 (W) x 87 (D) x 13 (D) mm	With standard size cover
	Approx. 85 (W) x 78 (D) x 13 (D) mm	With large size cover
Weight	Approx. 40 g	With standard size cover
	Approx. 45 g	With large size cover

3. Interfaces

3.1 DT-X11

CF Extension Slot

Table 3.1

	Specification	Remark
Interface	CFA Rev.1.3 compatible	CF Type I/II 3.3V only
Power voltage	3.3V±5%	
Supply current	300 mA (maximum)	

Pin Assignment

Table 3.2

Memory Mode		I/O Mode		Pin no.	Pin no.	Memory Mode		I/O Mode	
Name	I/O	Name	I/O			Name	I/O	Name	I/O
GND	P	GND	P	1	26	-CD1	I	-CD1	I
D03	I/O	D03	I/O	2	27	D11	I/O	D11	I/O
D04	I/O	D04	I/O	3	28	D12	I/O	D12	I/O
D05	I/O	D05	I/O	4	29	D13	I/O	D13	I/O
D06	I/O	D06	I/O	5	30	D14	I/O	D14	I/O
D07	I/O	D07	I/O	6	31	D15	I/O	D15	I/O
-CE1	O	-CE1	O	7	32	-CE2	O	-CE2	O
A10	O	A10	O	8	33	-VS1	I	-VS1	I
-OE	O	-OE	O	9	34	-IORD	O	-IORD	O
A09	O	A09	O	10	35	-IOWR	O	-IOWR	O
A08	O	A08	O	11	36	-WE	O	-WE	O
A07	O	A07	O	12	37	RDY/BSY	I	IOREQ	I
VCC	P	VCC	P	13	38	VCC	P	VCC	P
A06	O	A06	O	14	39	-CSEL	O	-CSEL	O
A05	O	A05	O	15	40	-VS2	I	-VS2	I
A04	O	A04	O	16	41	RESET	O	RESET	O
A03	O	A03	O	17	42	-WAIT	I	-WAIT	I
A02	O	A02	O	18	43	-INPACK	I	-INPACK	I
A01	O	A01	O	19	44	-REG	O	-REG	O
A00	O	A00	O	20	45	BVD2	I/O	-SPKR	I/O
D00	I/O	D00	I/O	21	46	BVD1	I/O	-STSCHG	I/O
D01	I/O	D01	I/O	22	47	D08	I/O	D08	I/O
D02	I/O	D02	I/O	23	48	D09	I/O	D09	I/O
WP	-	-IOIS16	-	24	49	D10	I/O	D10	I/O
-CD	I	-CD2	I	25	50	GND	P	GND	P

Directions of data flow;

I : DT-X11 ← CF card

O : DT-X11 → CF card

I/O : DT-X11 ⇔ CF card

P : Power, GND

Table 3.3 IrDA interface

Item		Specification	Remark
Communication speed, modulation			
	Standard	IrDA Ver. 1.1 compatible	
	FIR	4 Mbps 4-value PPM modulation	
	MIR	1.152 M, 576 Kbps NRZ modulation	
	SIR	2.4 K to 115.2 Kbps NRZ modulation	
Emission unit			
	Peak wave length	880 to 900 nm	
	Emission strength	Type 75 mW/sr	
	Emission angle	±15°	
Reception unit			
	Reception wave length	850 to 900 nm	
	Incident illuminant	SIR: 0.75 mW/cm^2 or less FIR: 200 to 0.75, 0.33 to 0.12 mW/cm^2	
	Communication range	0 to 1m (Maximum 25 cm at 4 Mbps)	
Connectable devices			
	HT-to-HT comm.	Between DT-X11 and DT-X11	
	Communication via cradle	Bridge Satellite Cradle (DT-160IOE)	

Table 3.4 Earphone

Item	Specification	Remark
Method	Monaural	
Connectable device	Earphone	

Table 3.5 Power supply

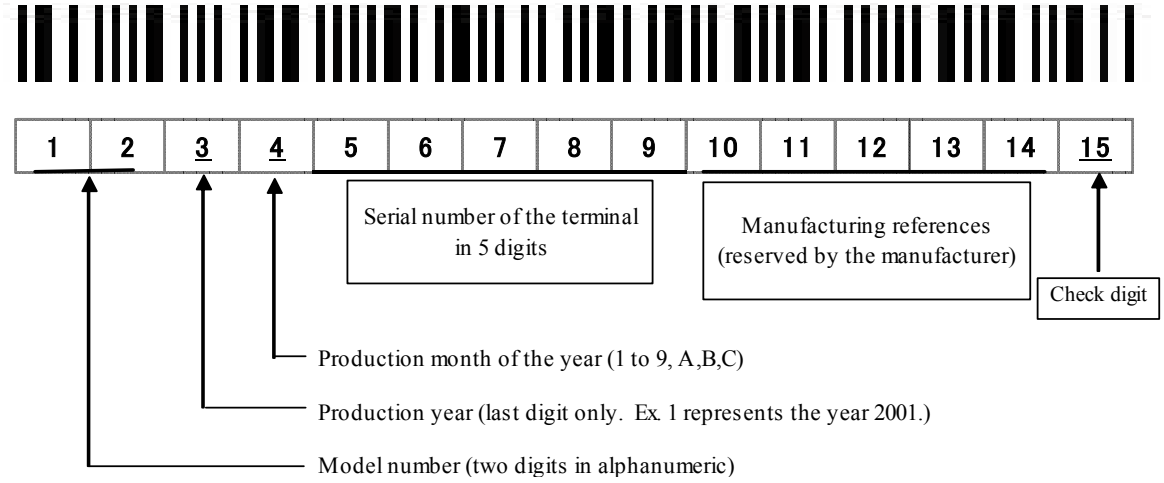
Item		Specification	Remark/Condition
HA-A20BAT/DT-5025LBAT			
	Rated voltage	3.7 V	
	Rated capacity	1,700 mAh (HA-A20BAT) 3,400 mAh (DT-5025LBAT)	
	Operating hours	Approx. 8 (w/HA-A20BAT)	- In case of Wait:Calculation:Scanning 20:1:1
		Approx. 18 (w/DT-5025LBAT)	
		Approx. 4 (w/HA-A20BAT)	- For DT-X11M10RC/M30RC - In case of Wait: Scanning:Wireless 6.5:1.5:2.
		Approx. 10 (w/DT-5025LBAT)	
	Memory backup period	10 minutes for data in RAM	- At moderate temperature - Memory backup battery is fully charged.
		2 weeks for built-in Real Time Clock	
	Recharge memory backup battery	4 days	- Period required for the sub-battery to be fully charged when the battery pack is installed in the terminal

Continue.

Memory backup battery			
	Battery type	Button-shape Lithium rechargeable battery (CR-2032)	
	Rated voltage	3.0 V	
Battery low warning			
	Low main battery voltage	VDET1: 3.4 V	Warning display, but still operable.
	Forcible OFF	VDET2: 3.0 V	Forcible OFF.
	Low sub-battery voltage	VDETS: 2.3 V	Data cannot be retained.

4. Product Identification and Reference Numbers

On the back of the DT-X11 and its options, there is a bar code and numbers printed on label as shown in Fig 4.1. 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 each terminal. The numbers from 10 to 15 represent a manufacturing reference which is reserved by the manufacturer. See the figure below for each meaning.



5B: DT-X11M10E
5C: DT-X11M10RC
5D: DT-X11M30E
5E: DT-X11M30U
5F: DT-X11M30RC

Fig 4.1

5. Quality References

This chapter will describe about references of the DT-X11 and its dedicated options concerned with environmental performance, compliance, mechanical and electric durability, etc.

5.1 Environmental Performances

5.1.1 DT-X11

Table 5.1

Item			Specification	Condition
Temperature				
	DT-X11M30RC DT-X11M30E	Operation	-20 ºC to 50 ºC	0 to 40 ºC for charging battery pack
	DT-X11M30U	Non-operation	-20 ºC to 70 ºC	
	DT-X11M10RC DT-X11M10E	Operation	-10 ºC to 50 ºC	0 to 40 ºC for charging battery pack
		Non-operation	-20 ºC to 60 ºC	
Humidity				
		Operation	10 % to 80 %RH	No condensation
		Non-operation	5 % to 90 %RH	
Dust and water-splash proof				
			IP54 level, compliant with IEC60529 standard	
Storage in carton box				
		Temperature	-10 ºC to 50 ºC	
		Humidity	90 %RH (Maximum)	

5.1.2 DT-160IOE/DT-169CHGE

Table 5.2

Item		Specification	Condition
Temperature			
	Operation	0 ºC to 40 ºC	
	Storage	-10 ºC to 50 ºC	
Humidity			
	Operation	30 % to 80 %RH	No condensation
	Storage	30 % to 90 %RH	
Storage in carton box			
	Temperature	-10 ºC to 50 ºC	
	Humidity	30 % to 90 %RH	No condensation

5.1.3 DT-167CHGE

Table 5.3

Item		Specification	Condition
Temperature			
	Operation	0 ℃ to 40 ℃	
	Storage	-40 ℃ to 85 ℃	
Humidity			
	Operation	30 % to 80 %RH	No condensation
	Storage	30 % to 95 %RH	
Storage in carton box			
	Temperature	-10 ℃ to 50 ℃	
	Humidity	30 % to 90 %RH	No condensation

5.1.4 DT-5022CHG

Table 5.4

Item		Specification	Condition
Temperature			
	Operation	0 ℃ to 40 ℃	
	Non-operation	-10 ℃ to 50 ℃	When battery is not charged.
	Storage	-10 ℃ to 55 ℃	
Humidity			
	Operation	20 % to 90 %RH	No condensation
	Storage	20 % to 90 %RH	
Storage in carton box			
	Temperature	-10 ℃ to 55 ℃	
	Humidity	20 % to 90 %RH	No condensation

5.1.5 HA-A20BAT/DT-5025LBAT

Table 5.5

Item		Specification	Condition
Temperature			
	Operation	0 ºC to 40 ºC	
	Non-operation	-5 ºC to 50 ºC	When battery is not charged.
	Storage	-10 ºC to 55 ºC	
Humidity			
	Operation	20 % to 90 %RH	No condensation
	Storage	20 % to 90 %RH	
Storage in carton box			
	Temperature	-10 ºC to 55 ºC	
	Humidity	90 %RH or less	No condensation

5.1.6 DT-894CFU

Table 5.6

Item		Specification	Condition
Temperature			
	Operation	-20 ºC to 50 ºC	
	Non-operation	-20 ºC to 70 ºC	
Humidity			
	Operation	10 % to 80 %RH	No condensation
	Storage	5 % to 90 %RH	
Storage in carton box			
	Temperature	-10 ºC to 55 ºC	
	Humidity	90 %RH or less	No condensation
Dust and water-splash proof			
		IP64 level (compliant with IEC60529)	All connectors are covered.

5.2 Electrical Performances

5.2.1 DT-X11

Table 5.7

Item		Specification	Remark
Power consumption		DC2.5A/3.7 to 5.0V	
Anti-static strength			
	Malfunction	±6 KV	150 pF, 330ohm
	Destruction	±12 KV	

5.2.2 DT-160IOE/DT-169CHGE

Table 5.8

Item		Specification	Remark
Current consumption		Approx. 0.1 A	When DT-X11 is not mounted on.
		Approx. 1.6 A	While supplying power or transmitting data.
Voltage		DC12V±5%	
Anti-static strength			
	Malfunction	±6 KV	150 pF, 330 ohm
	Destruction	±12 KV	
Power interruption		10 millisec. or less	
Line noise strength (Malfunction)		1,000 V	- Pulse frequency: 5KHz - Burst cycle: 300 millisec. - Number of pulses: 75 - Burst interval: 15 millisec.

5.2.3 DT-167CHGE

Table 5.9

Item		Specification	Remark
Current consumption		DC 12V :Approx. 1,400mA	While supplying power.
		DC 24V : Approx. 700 mA	
Voltage		DC12V/24V±5%	
Anti-static strength			
	Malfunction	±6 KV	150 pF, 330 ohm
	Destruction	±12 KV	

5.2.4 DT-5022CHG

Table 5.10

Item		Specification	Remark
Anti-static strength			- ESD method: 250 pF, 100 ohm
	Malfunction	±5 KV	- Probe: Finger type
	Destruction	±10 KV	- Polarity: ±

5.2.5 HA-A20BAT/DT-5025LBAT

Table 5.11

Item		Specification	Remark
Anti-static strength			- ESD method: 250 pF, 100 ohm
	Malfunction	±5 KV	- Probe: Finger type
	Destruction	±10 KV	- Polarity: ±

5.2.6 DT-894CFU CF Card Extension Unit

Table 5.12

Item		Specification	Remark
Power consumption		DC 0.65A / 3.0 to 5.0V	
Anti-static strength			150 pF, 330 ohm
	Malfunction	±5 KV	
	Destruction	±10 KV	

5.3 Mechanical Performances

5.3.1 DT-X11

Table 5.13

Item		Specification	Condition
Resistance to drop impact(height)			
	In bare condition	120 cm	Onto concrete, three times on each of the 6 sides and 4 corners.
	In individual carton box	70 cm or less	Onto concrete, one time on each of the 6 sides, 1 corner, 3 edges.
	In master carton box	50 cm or less	
Resistance to vibration		0.15G or less	10 to 55 Hz, In X,Y, and Z directions Reciprocally for 30 minutes

5.3.2 DT-160IOE/DT-169CHGE

Table 5.14

Item		Specification	Condition
Resistance to vibration		0.15 G or less	- 10 to 55 Hz, In X,Y, and Z directions - Reciprocally for 30 minutes
Resistance to vibration (in package)		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	One time for 6 faces onto concrete surface
	In individual carton box	70 cm or less	One time for 6 faces, 1 corner and 3 edges
	In master carton box	50 cm or less	

5.3.3 DT-5022CHG

Table 5.15

Item		Specification	Condition
Resistance to vibration		1 G or less	- 10 to 55 Hz, In X,Y, and Z directions - Reciprocally for 30 minutes
Resistance to vibration (in package)		2 G or less	- 10 to 55 Hz, In X,Y, and Z directions - Reciprocally for 30 minutes
Resistance to impact			
	In bare condition	75 cm	6 faces, 1 corner and 3 edges
	In individual carton box	75 cm or less	6 faces, 1 corner and 3 edges

5.3.4 HA-A20BAT/DT-5025LBAT

Table 5.16

Item	Specification	Condition
Resistance to vibration	1 G	- 10 to 55 Hz, In X,Y, and Z directions - Reciprocally for 15 minutes - While the power is being turned off.
Resistance to vibration (in carton box)	2 G	- 10 to 55 Hz, In X,Y, and Z directions - Reciprocally for 15 minutes
Resistance to impact		
In bare condition	75 cm	- 6 faces, 1 corner and 3 edges onto P tile.
In individual carton	75 cm or less	

5.3.5 DT-894CFU CF Card Extension Unit

Table 5.17

Item	Specification	Condition	
Resistance to vibration	0.15 G or less	- 10 to 55 Hz, - In X,Y, and Z directions - Reciprocally for 30 minutes - The unit is installed on DT-X11.	With the extension unit installed on the terminal
Resistance to impact			
In bare condition	120 cm	- 3 times of each faces (6faces) and corner (4corners) onto concrete surface	With the standard size card cover installed on the terminal.
	40 cm	- 1 time of each faces (6faces) and corner (4corners) onto lauan wood surface	With the large-sized card cover installed on the terminal.
In individual carton box	70 cm or less	- 1 time of each face (6 faces), corner (1 corner) and edge (3 edges)	
In master carton	50 cm or less		

5.4 Reliability

5.4.1 DT-X11

Table 5.18

Item		Specification	Remark/Condition
Backlight		5,000 hours	At half-life period
Scanner module		10,000 hours	
C-MOS Imager		300,000 hours	
USB connector		5,000 times	
PC Card slot cover		100 times	
Trigger keys		1,000,000 times	Each trigger key
Other keys		500,000 times	
Mounting/removing of DT-X11 to/from the Cradle		10,000 times	
Touch panel	Key input	800,000 times	With 0.8R polyester stylus with load of 250g applied
	Writing	100,000 with Katakana characters	
MTBF		64,685 hours	Electronic parts only
MTBF (WLAN module)		27,000 hours	
Charging and discharging cycle of battery pack		300 times or more	Applicable to HA-A20BAT / DT-5025LBAT

5.4.2 DT-160IOE/DT-169CHGE

Table 5.19

Item		Specification	Remark/Condition
MTBF for electronics parts		50,000 hours	
Mounting/removing DT-X11 to/from Cradle		20,000 times	
Switch	Power switch	5,000 times	
	DIP switch	10 times	
No. of ON/OFF times of the connector	USB	500 times	
	RS-232C	500 times	
	RS-422	100 times	
No. of ON/OFF times of the power jack		1,500 times	

5.4.3 DT-5022CHG

Table 5.20

Item	Specification	Remark
MTBF	210,000 hours or more	MIL-HDBK217F
Protection from short	Internal circuit is protected from a short between the charge terminals	

5.5 Compliance

5.5.1 DT-X11

Table 5.21

Category	Standard	DT-X11M30U	DT-X11M10E DT-X11M30E	DT-X11M10RC DT-X11M30RC	Remarks
Safety	UL1950 3rd Edition	Yes	No	No	US
	EN60950-1	No	Yes	Yes	EU
	GB4943	No	Yes	Yes	CCC
WLAN Type Approval	FCC part 15C, OET-65(SAR)	Yes	No	No	US
Bluetooth Type Approval	EN300328-2 V1.21	No	Yes	Yes	EU
	SRRC	No	Yes	Yes	China
Laser Beam	EN60825-1:1996	N/A	Yes	Yes	EU
	IEC60825	N/A	Yes	Yes	China
EMI	FCC part 15B	Yes	No	No	US
	EN301489-17 V1.1.1(09-2000)	No	Yes	Yes	EU
	GB9245 GB17625.1	No	Yes	Yes	CCC
	C-Tick	No	Yes	Yes	Australia New Zealand
EMS	EN55024:1998 +A1:2001 +A2:2003	No	Yes	Yes	EU
Bluetooth Logo		Yes	Yes	Yes	

5.5.2 DT-160IOE/DT-169CHGE

Table 5.22

	Standard	
	Europe	USA
EMC	EN55022:1998+A1:2000 Class B	FCC Part 15B Class B
	EN55024:1998+A1:2001 Class B	
Safety	EN60950	UL1950 3rd Edition

6. Cable Specifications

6.1 For Chain Connection and Short Length

Length; 1 meter or less

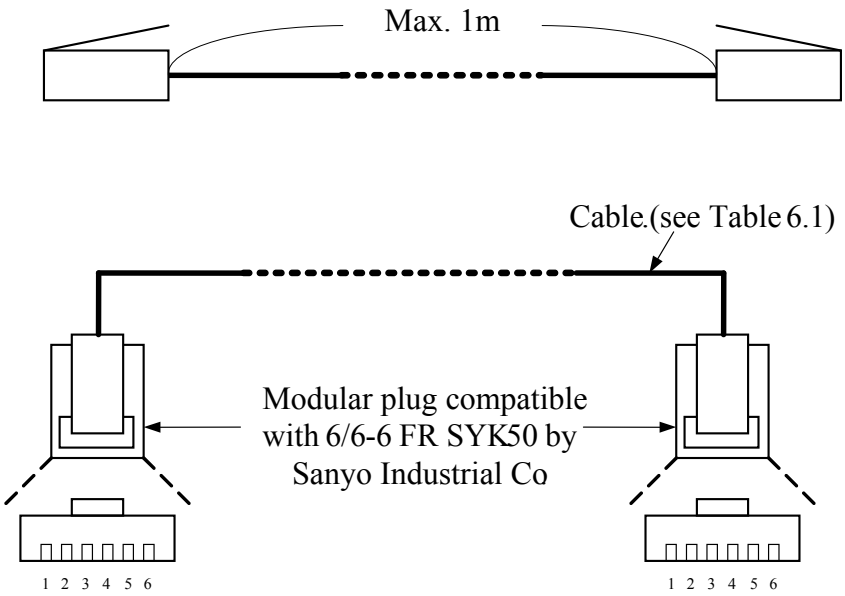


Fig. 6.1

Table 6.1 Specifications of the cable

Cable		
Core wire	Conductor	20/0.1A
	Insulator	Semi-hard material P.V.C.
	Finish of external shape	20/0.1A
Sheath	Insulator	P.V.C.
	Finish of external shape	φ4.3±0.1mm
Characteristics	Conductance resistance	0.12Ω/m or less
	Insulation resistance	50MΩ or more

Pin layout diagram of cable for chain connection and short distance (pin-to-pin straight connection)

Wiring

Cradle at lower position under the chain connection

Pin no.	Signal	Pin no.	Signal
1	IRS+	1	ORS+
2	IRS-	2	ORS-
3	ISD+	3	OSD+
4	ISD-	4	OSD-
5	ORD+	5	IRD+
6	ORD-	6	IRD

Cradle at higher position under the chain connection

Fig. 6.2

6.2 For Chain Connection and Long Length

Length; 1 meter or longer

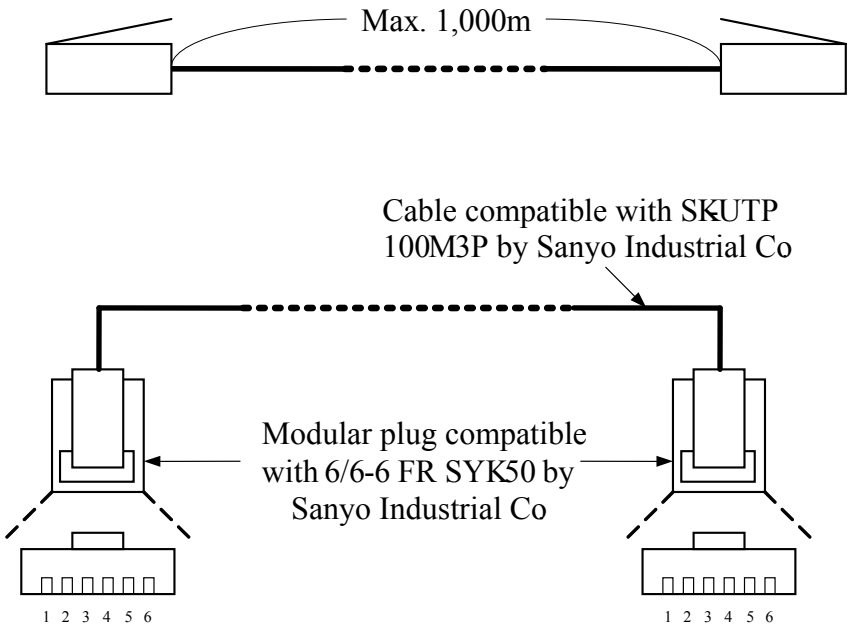


Fig. 6.3

Pin layout diagram of cable for chain connection and long distance (pin-to-pin straight/twist-pair connection)

Wiring

Cradle at lower position under the chain connection

Pin no.	Signal		Pin no.	Signal
1	IRS+		1	ORS+
2	IRS-	XXXXXXX	2	ORS-
3	ISD+		3	OSD+
4	ISD-	XXXXXXX	4	OSD-
5	ORD+		5	IRD+
6	ORD-	XXXXXXX	6	IRD

Cradle at higher position under the chain connection

Fig. 6.4

7. Precautions

7.1 Handling

Precautions for short-term storage (1 to 2 days period)

- If the DT-X11 is to be stored over holidays (including Saturday and Sunday), replace the HA-A20BAT (or DT-5025LBAT) battery pack with fully charged one before it is stored. This will conserve the memory backup battery and ensure retention of data on the DT-X11.
- If there is a possibility of the above or operator error (e.g., a fully charged battery pack has not been installed), practice system operation so that a backup to avoid loss of data due to low battery voltage is carried out periodically.

Precautions for long-term storage (over one week period)

- Prior to long-term storage (over one week period), always back-up data. In addition, remove the battery pack and memory backup battery before storage. This can minimize overly discharging the battery pack and the memory backup battery.
- Do not store the removed battery pack and memory backup battery at high temperature. Otherwise, they will discharge at an accelerated rate. Note that the capacity of the battery if it is not used for 10 days and is kept at 60°C will be 65%, and that for 20 days and is kept at 60°C will be 55%.

7.2 Safety

7.2.1 Battery Pack/Memory Backup Battery

Battery Pack

- Never disassemble or retrofit the battery pack. The battery pack has safety mechanism and protection means incorporated to avoid hazards. Should they be damaged, the battery pack could become hot, generate smoke, explode, or ignite.
- Never contact the "+" and "-" terminals with a metal object such as wire. Also, do not carry or store the battery with a metal case. Otherwise, the battery pack may be short-circuited resulting in an excessive current and causing the battery pack to become hot, smoke, explode, or catch fire.
- Neither dispose of the battery pack into a fire nor heat it. The insulation may be burnt, the gas exhaust valve or safety mechanism may be damaged, or the internal electrolyte may ignite, causing the battery pack to become hot, smoke, explode, or ignite.
- Neither leave nor use the battery pack in a place with a high temperature (over 80°C) or close to a fire or hot stove. Should the resin separator be damaged due to excessive heat, the battery pack may be short-circuited causing it to become heated, smoke, explode, or ignite.
- Do not soak the battery pack in fresh water or sea water. If the protection means incorporated in the battery pack are damaged, the battery pack may become hot, smoke, explode, or ignite.
- Do not attempt to charge the battery pack close to a fire, in direct sunlight, or in a car parked in the sun. A heated battery pack will trigger the internal hazard protection means to stop the charging function. Or, the protection means may be damaged and the battery may be charged with an excessive current or voltage, or have abnormal chemical reactions induced to cause it to become hot, smoke, explode, or ignite.
- Do not stick a pin or nail in the battery pack. Neither hit it with a hammer nor stamp on it. If this is done, the battery pack may be broken or deformed resulting in a short circuit and causing it to become hot, smoke, explode, or ignite.
- Do not hit or throw the battery pack. If the protection means incorporated in the battery pack are damaged, the battery pack may be charged with an excessive current or voltage, or have abnormal chemical reactions induced to cause it to become hot, smoke, explode, or ignite.
- Never use a battery pack that is significantly damaged or deformed. It may become hot, smoke, explosion, or ignite.
- Do not attempt to solder anything directly on the battery pack surface. The insulation may be damaged or the gas exhaust valve or safety mechanism may be damaged, causing the battery pack to become hot, smoke, explode, or ignite.
- Do not use the battery pack in other devices than the specified products by CASIO. The performance or service life of it may be reduced or abnormal current may flow to cause it to become hot, smoke, explode, or ignite.
- When charging the battery pack with battery charger or cradle use only the dedicated AC adaptor supplied from CASIO, at a temperature between 0°C and 40°C. If the battery pack is charged with chargers or cradles other than those specified by CASIO, it may be over-charged, or charged with an excessive current, or have abnormal chemical reactions induced, causing it to become hot, smoke, explode, or ignite.

- The battery pack has a specific polarity. Do not force it into the DT-X11 when installing. Check the polarity. If the battery pack is connected backwards, it can be incorrectly charged and have an abnormal chemical reaction induced, causing it to become hot, smoke, explode, or ignite.
- If the internal electrolyte of the battery pack leaks and gets in your eye, do not rub the eye. Rinse the eye with a sufficient amount of clean water, such as tap water, then immediately consult with a medical doctor. The electrolyte can cause eye damage.

Memory Backup Battery

- Do not attempt to disassemble or solder the memory backup battery. Also, do not heat or throw it into a fire.
- When the button-type battery used in this terminal is removed, exercise care so as not to accidentally swallow it. Remain aware of the danger to infants. Store it in an infant-safe location. Should it be swallowed, immediately consult a medical doctor.
- If the battery is improperly used, the electrolyte may leak and soil other objects, resulting in fire and personal injury.
  Be sure to observe the following precautions:
  - Make sure of the polarity (+, or -) of the battery when installing it.
  - Do not leave the terminal unused for an extended period of time with the battery installed.
  - Only use the battery specified for the DT-X11.

7.2.2 General

- Avoid exposing it to water and foreign matter. Should foreign matter (metal chips, water, liquid chemicals) enter inside the DT-X11, immediately turn off it, remove the batteries, unplug the AC adaptor, then contact a CASIO distributor.
- Be aware of abnormal conditions. If the DT-X11 is continuously used in an abnormal condition, a fire or electric shock may occur. If there is an abnormality on the terminal, immediately turn off the Power switch, and be sure to remove the batteries and unplug the AC adaptor from the wall outlet, then contact a CASIO distributor for repair.
- Do not use the AC adaptor with a line voltage other than that indicated on its rating plate. Also, avoid drawing power from an outlet used by multiple devices. This may cause fire or an electric shock.
- AC adaptor
  - Always use the dedicated AC adaptors only. If an AC adaptor that is not specified is used, the battery pack may explode, causing a fire or personal injury.
  - Do not touch the AC adaptor with wet hands. This may result in an electric shock. Also, place the AC adaptor in a place where it is not subject to dust, moisture and water. Dust and dirt may cause fire and smoke, and moisture and water may cause an electric shock.
  - When this terminal is not used for an extended period of time, e.g. during absences, unplug the AC adaptor from the wall outlet.
- Power cable of AC adaptor
  - Do not damage, break, retrofit, bend, twist, or stretch the power cable. Also, do not place a heavy object on it or heat it. If this is done, the power cable may be broken and cause a fire or electric shock.
  - Do not bring the power cable close to heating equipment such as stove. The cable coating may burn or melt, resulting in fire or electric shock.
  - Do not bring the power cable close to a container filled with liquid. If the cable becomes wet or should the container be tipped over, a fire or electric shock may result.
  - Do not unplug the AC adaptor by pulling its cable by hand. The cable may be damaged causing a fire or electric shock. Always hold the AC adaptor itself.
- Memory protection
  - Contents of the DT-X11 should always be backed up in personal computer to make a separate record from that in the terminal. The contents of the memory may accidentally be lost due to battery power consumption, etc. This also occurs when the terminal malfunctions or is repaired.
  - When replacing the battery, always consult the operation manual. Improper battery replacement may lead to unexpected loss or alteration of data.
- Places for installing DT-X11
  - Do not place the DT-X11 in an environment with a significant amount of moisture or dust. Otherwise, a fire or electric shock may occur.
  - Do not use the DT-X11 in the vicinity of a cooking table, humidifier, etc., where it will be subjected to oily smoke or vapor. Otherwise, a fire or electric shock may occur.
  - Do not place the DT-X11 in an unstable situation, such as on a wobbling platform or shelf. It may fall and cause personal injury.
  - Do not throw the DT-X11 into a fire. This may cause a fire or personal injury due to explosion of the terminal.