Scantech ID Shuttle SG-15 Price Checker

Service manual

Scantech-ID Shuttle SG-15

Limited Warranty
Under all circumstances this manual should be read attentively, before installing and/or using the product. In no event shall Scantech-ID BV be liable for any direct, indirect, special, consequential or incidental damages arising out of the use or inability to use this documentation or product, even if advised of the possibility of such damages. In particular, Scantech-ID BV shall not be liable for any hardware, software, or data that is stored or used with the product, including the cost of repairing, replacing or recovering the above. Scantech-ID BV reserves the right to change parts of the device at any time without preceding or direct announcement to the client. Scantech-ID BV reserves the right to revise this manual, and to make changes in the contents without obligation to notify any person or entity of the revision or change. A serial number appears on the product. Make sure that this official registration number has not been removed. It should be used whenever servicing by Scantech-ID BV or an authorised Scantech dealer is necessary.

Important
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to EN55022, and with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's manual, may cause harmful interference to radio communications. Operation of the equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any unauthorised changes or modifications to this equipment could void the user's authority to operate this equipment.

- The Shuttle is in conformity with the CE standards. Please note that a Scantech CE-marked power supply unit should be used to conform to these standards.

Radio and television interference
Operation of this equipment in a residential area can cause interference with radio or television reception. This can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:
- Re-orientate the receiving antenna
- Relocate the devices with respect to the receiver
- Move the device away from the receiver
- Plug the device into a different outlet in order to have the device and receiver on different branch circuits

If necessary, the user should consult the manufacturer, an authorised Scantech dealer or experienced radio/television technician for additional suggestions. The booklet "How to Identify and Resolve Radio-TV Interference Problems", prepared by the Federal Communications Commission, can be of help. It can be obtained from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004000003454.

P/N A372003 January 2008

Table of contents

Introduction

This Service Manual describes the diagnostics and replacements of defective modules within the Shuttle SG-15. If problems occur with the price checker, a component or module may be defective. However, the problems may be well be the result of improper installation of the Price checker It is advised to refer to the list of diagnostic tips in the User's Manual "Scantech ID Shuttle SG-15", before consulting this Service Manual.
If the list of Diagnostic tips in the User's Manual can not be of help, this manual allows you to determine the problem in detail. Special flow charts should finally lead to the module to be replaced. The procedures for replacing the defective module as described in this manual, will ensure correct disassembly and assembly of the Price checker.

General contents:

Chapter 1 – Repairing the Shuttle SG-15: General Information - This Chapter should be read before repairing the Price checker! The tools required to carry out replacements are described, as well as the replaceable parts. The final section contains the safety notices which should be observed while following the replacement instructions described in Chapter 3 and 4.

Chapter 2 – Problem isolation - By means of the flow chart in this chapter and information obtained by analyzing the state if the Price checker, a defective part can be isolated. With the obtained information, you should proceed to Chapter 3 for the replacement instructions.

Chapter 3 – Removing and replacing Price checker parts - Should the problem isolation procedure in Chapter 2 indicate that the Price checker parts must be replaced, then this can be accomplished by following the corresponding instructions.

Chapter 4 – Configuring the Shuttle - After removing and replacing of several Price checker parts, your Shuttle SG-15 should be configured before assembly and continue with successful operation.

Chapter 5 – Maintaining the Shuttle – After repair and configuration the Shuttle requires little maintenance to remove dirt and fingerprints.

Appendices

Chapter 1 Repairing the Shuttle SG-15: General information

This chapter contains general information on the repairing procedures for the Shuttle SG-15. This information should be read thoroughly before proceeding to the next chapters.
The Shuttle SG-15 has various fragile interior parts. To prevent then from being damaged you are advised to use the tools described in Section 1.1. All these tools are generally available.
In Section 1.2 an exploded view of the Price checker is shown. This figure lists the names of the major Price checker parts and shows their relative positions. Section 1.3 states the precautionary measures to be considered before opening the Price checker and replacing any parts.

1.1   REQUIRED TOOLS

This section features a list of tools required for replacing the various modules. Make sure that all tools are at hand before starting service and/or repair works.

ESD-equipment   The Antistatic Mat or Table an Wrist Strap must be used in order to prevent damage to the Price checker due to electrostatic discharge.

Screwdriver PH 0   This screw driver is used for loosing and replace screws from bracket.

Screwdriver PH 1   This screw driver is used for loosing and replace screws from main board.

Torx screwdriver T-10 This screw driver is used for loosing and replace torx screws from housing and bracket.

Tweezer   These are used for removing and place small parts.

1.2 REPLACEABLE PARTS

The Shuttle SG-15 consists of several modules that can be removed and replaced in whole or in parts. The exploded view shows their relative positions. the modules are:
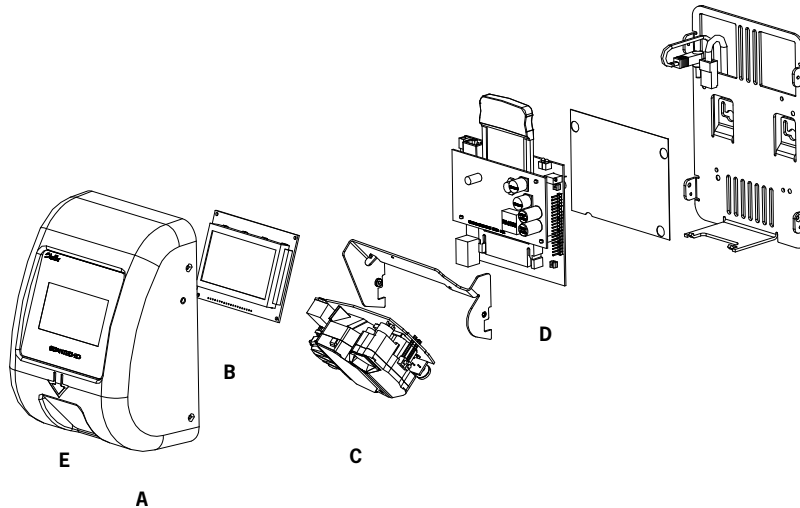
A. Color cover with window.

B. LCD
    The display size is 128x64 pixels
    The display features white characters on a blue backlight background.

C. Scantech Omni-directional scan engine or CCD line scan engine.

D. Main board, PoE add-on PCB (optional) <u>or</u> PCMCIA card (optional).

E. Window Scanner (red).

The procedures for replacing each of these modules are listed in Chapter 3. Your are advised to follow these procedures when replacing a module. Carrying out maintenance procedures not specified in this manual may violate laser and electrical safety regulations and can result in exposure to hazardous laser light.

1.3   SAFETY NOTICES

Laser safety

German:
Der Strichcode-Scanner SHUTTLE entspricht den Sicherheitsvorschriften nach IEC 825-1 (1993) für ein Laserprodukt der Klasse I. Er entspricht auch U.S. 21CFR1040, anwendbar auf ein Laserprodukt der Klasse IIa. Vermeiden Sie langzeitiges Hineinblicken in direktes Laserlicht.

Dutch:
De SHUTTLE scanner voldoet aan de veiligheidsnormen IEC 825-1 (1993) voor een Klasse I laserproduct. Tevens voldoet de scanner aan U.S. 21CFR1040, van toepassing op een Klasse IIa laserproduct. Vermijd langdurig kijken in direct laserlicht.

French:
Le scanner SHUTTLE est conforme aux normes de sécurité IEC 825-1 (1993) s'appliquant à un produit laser de la classe I. Il est également conforme à la U.S. 21CFR1040 telle qu'elle s'applique à un produit laser de la classe IIa. Eviter de rester exposé longtemps à la lumière directe du laser.

Danish:
SHUTTLE skanneren er i overensstemmelse med sikkerhedsstandarden IEC 825-1 (1993) for laserprodukter i klasse I. Den er også i overensstemmelse med U.S. 21CFR1040, der gælder for laserprodukter i klasse IIa. Undgå at se direkte på laserlys i længere perioder..

Finnish:
SHUTTLE-skanneri täyttää luokan I lasertuotteelle IEC 825-1:ssä (1993) asetetut turvavaatimukset. Se täyttää myös U.S. 21CFR1040:ssa asetetut vaatimukset siltä osin kuin ne koskevat luokan IIa lasertuotetta. Vältä pitkäaikaista suoraan laservaloon katsomista.

Swedish:
Avsökaren SHUTTLE uppfyller säkerhetsnormen IEC 825-1 (1993) för laserprodukter av klass 1. Den uppfyller dessutom U.S. 21CFR1040 som gäller för laserprodukter av klass IIa. Undvik att titta i direkt laserljus under längre perioder.

Norwegian:
SHUTTLE skanneren er i samsvar med sikkerhetsstandarden IEC 825-1 (1993) for laserprodukter i klasse I. Den er også i samvar med U.S. 21CFR1040 for laserprodukter i klasse IIa. Unngå å se langvarig på direkte laserlys.

Italian:
Lo scanner SHUTTLE è conforme alle norme di sicurezza IEC 825-1 (1993) relative ad un prodotto laser di Classe 1. È inoltre conforme alla norma U.S. 21CFR1040 relativa ad un prodotto laser di Classe IIa. Evitare l'esposizione prolungata all'emissione diretta di luce laser.

Portuguese:
O scanner SHUTTLE está conforme as normas de segurança IEC 825-1 (1993) para a Classe 1 dos produtos laser. Também está conforme a norma U.S. 21CFR1040 aplicada nos produtos laser da Classe IIa. Evite expor os olhos directa e prolongadamente aos raios laser.

Spanish:
El scanner SHUTTLE reune las normas de seguridad IEC 825-1 (1993) para un producto laser de Clase 1. Y también reune las normas U.S. 21CFR1040 que se aplican a un producto laser de Clase IIa. Se debe evitar mirar muy fijo en luz lasérica directa.

English:
The SHUTTLE scanner complies with safety standard IEC 825-1 (1993) for a Class I laser product. It also complies with U.S. 21CFR1040 as applicable to a Class IIa laser product. Avoid long term viewing of direct laser light.

Optical:
The use of optical instruments with this product will increase eye hazard. Optical instruments include binoculars, microscopes and magnifying glasses but do not include eyeglasses worn by the user.

Radiant Energy:
The SHUTTLE uses a low-power laser diode operating at 630…670 nm in an opto-mechanical scanner resulting in less than 0.6 mW peak output power. Laser light observed at 13 cm (5.1 in.) above the window through a 7 mm (0.28 in.) aperture and averaged over 1000 seconds is less than 3.9 µW per CDRH Class IIa specification. Do not attempt to remove the protective housing of the scanner, as unscanned laser light with a peak output up to 0.8 mW could be accessible inside.

Laser Light Viewer:
The scanner window is the only aperture through which laser light may be observed on this product.
A failure of the scanner motor, while the laser diode continues to emit a laser beam, may cause emission levels to exceed those for safe operation. The scanner has safeguards to prevent this occurrence. If, however, a stationary laser beam is emitted, the failing scanner should be disconnected from its power source immediately.

Adjustments:
Do not attempt any adjustments to or alteration of this product. Do not remove the scanner's protective housing. There are no user-serviceable parts inside.

CAUTION

> Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Below the laser safety labels for the Shuttle SG-15 are depicted. The Price checker has been equipped with protective provisions preventing exposure to harmful levels of laser light during normal operation, or while carrying out the instructions described in this Service Manual.
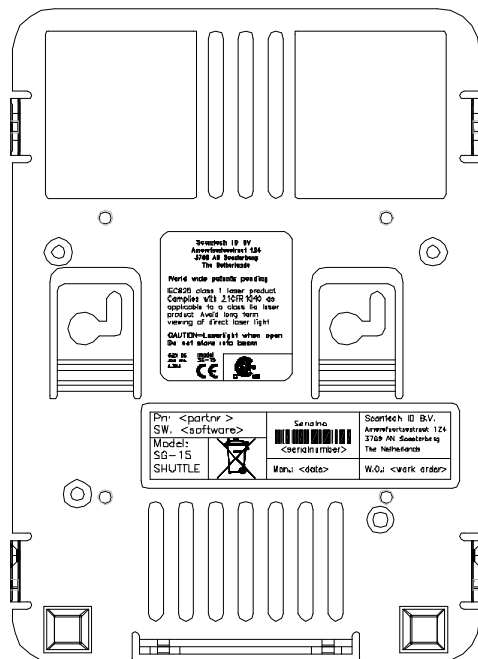
Precautionary measures

The following precautions should be observed when repairing the Price checker.

- Repairs to the Price checker should be preformed by authorized personnel only

- Unless instructed otherwise, the communication cable and Power Supply should be disconnected from the Price checker during service and/or repairs jobs.

- Repairs should be carried out in a clean, dust-free environment.

- Wear appropriate clothing and shoes insensitive to static built-up.

- Do not touch the display when you replace the display.

- Never leave the opened Price Checker unattended.

- Use the Antistatic Mat during repair jobs. Ground both yourself and the working surface before touching any internal price checker components. This will provide a discharge path to ground.
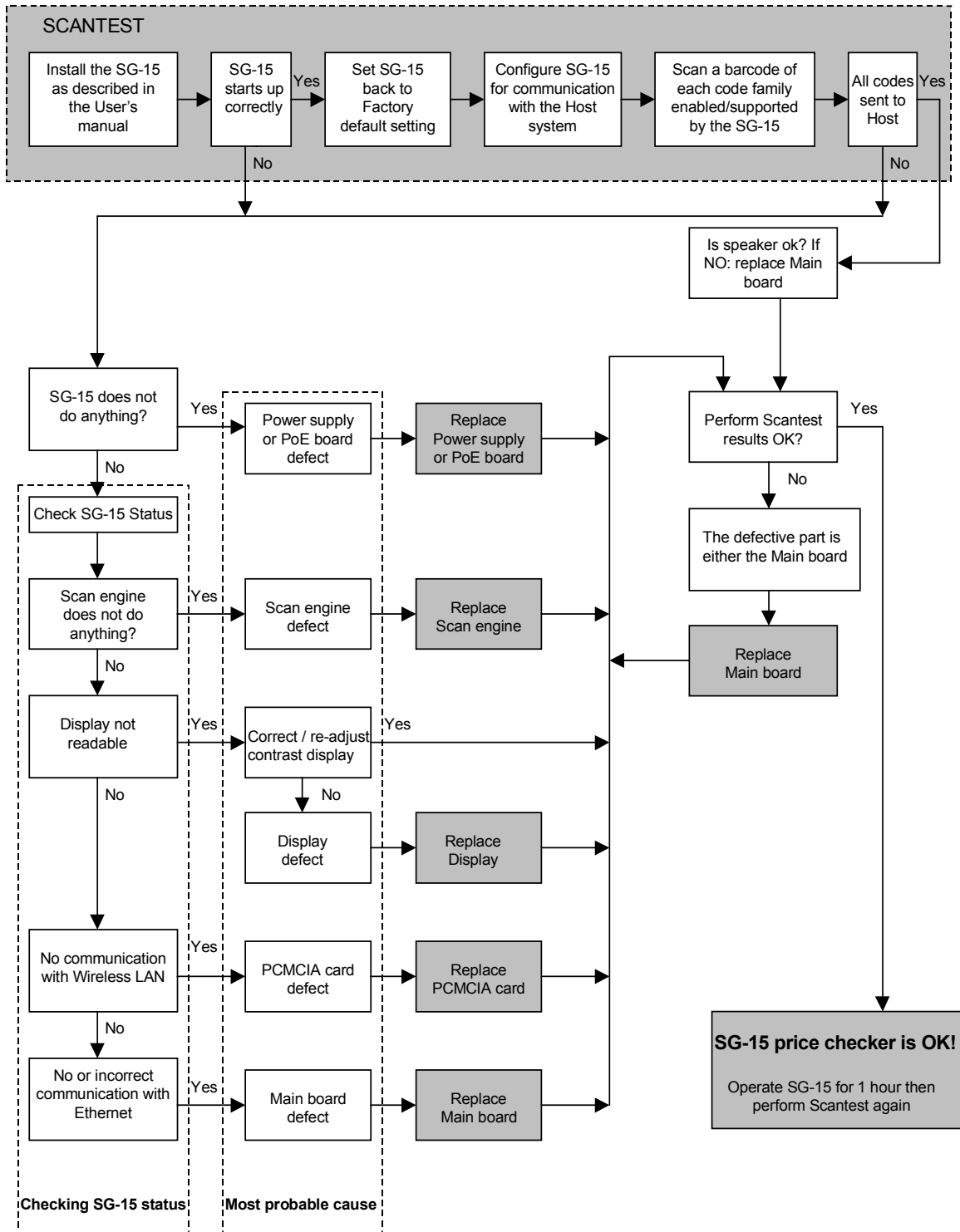
Chapter 2 Problem isolation

2.1   DIAGNOSING THE PROBLEM

In case the Shuttle SG-15 is malfunctioning, the flow chart in this chapter lists the procedures for isolating the problem. The state of the Price checker should provide sufficient information to guide you trough the flow chart and lead you to the Price checker Part that needs to be replaced. The corresponding replacement instructions are described in Chapter 3.

2.2   TROUBLESHOOTING FLOW CHART

The flow chart on the next page has been designed to guide you to a defective Price checker part if a failure has occurred. This part should then be replaced in accordance with the instructions in Chapter3.

Before the SCAN TEST (in the upper left corner of the chart) can be carried out, the Price checker has to be installed according to the instructions in the User's manual. After power on, the Price checker will start up.

SCANTEST

Install the SG-15 as described in the User's manual → SG-15 starts up correctly —Yes→ Set SG-15 back to Factory default setting → Configure SG-15 for communication with the Host system → Scan a barcode of each code family enabled/supported by the SG-15 → All codes sent to Host —Yes→

SG-15 starts up correctly —No→

All codes sent to Host —No→

Is speaker ok? If NO: replace Main board

SG-15 does not do anything? —Yes→ Power supply or PoE board defect → Replace Power supply or PoE board →

SG-15 does not do anything? —No→

Perform Scantest results OK? —Yes→

Perform Scantest results OK? —No→ The defective part is either the Main board → Replace Main board

Check SG-15 Status

Scan engine does not do anything? —Yes→ Scan engine defect → Replace Scan engine →

Scan engine does not do anything? —No→

Display not readable —Yes→ Correct / re-adjust contrast display —Yes→

Correct / re-adjust contrast display —No→ Display defect → Replace Display →

Display not readable —No→

No communication with Wireless LAN —Yes→ PCMCIA card defect → Replace PCMCIA card →

No communication with Wireless LAN —No→

No or incorrect communication with Ethernet —Yes→ Main board defect → Replace Main board →

SG-15 price checker is OK!

Operate SG-15 for 1 hour then perform Scantest again

Checking SG-15 status　　　**Most probable cause**

Chapter 3 Removing and replacing Price checker parts

The previous chapter dealt with various Price checker failures, the causes of which can be determined by means of a flow chart. This chapter gives detailed instructions on how to replace a defective Price checker module. The figures illustrate how to follow these instructions. In order to replace a defective part, the Price checker needs be open / disassembled first. Below, the replacement instructions corresponding with the following parts are described:

1. Front housing
2. Window scanner (red)
3. Scan engine (Omni directional or CCD)
4. Main Board
5. PoE Board
6. PCMCIA Card
7. Display

.

IMPORTANT

When repairing the Price checker, always take notice of the safety precautions described in Chapter 1. Instructions are to be carried out by authorized personnel only. Following repair procedures not specified in this manual may violate laser and electrical safety regulations.

Disassembly

|	
Front housing / Window scanner	Follow instruction 3.1.1
Scan Engine	Following instructions 3.1.1 & 3.1.2
Main Board	Following instructions 3.1.1 & 3.1.2(A) & 3.1.3
PoE Board	Following instructions 3.1.1 & 3.1.2(A) & 3.1.3(A) & 3.1.4
PCMCIA Card	Following instructions 3.1.1 & 3.1.5
Display	Following instructions 3.1.1 & 3.1.2(A) & 3.1.6

Assembly

|	
Main board	Follow instruction 3.2.1
PCMCIA Card	Follow instruction 3.2.2
PoE Board	Follow instruction 3.2.3
Display	Follow instruction 3.2.4
Front housing / Window scanner	Follow instruction 3.2.5
Scan Engine	Follow instruction 3.2.6

3.1   DISASSEMBLY

3.1.1   Open Shuttle SG-15

Open Shuttle SG-15 by loosing the four screws and remove them, each side two screws. Lift front housing from back plate.

Pay attention for window scanner red, this part is not fixed anymore when you lift front housing from back plate.
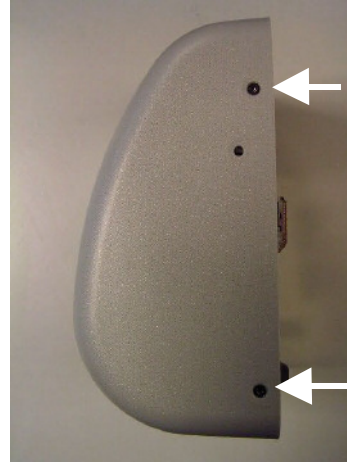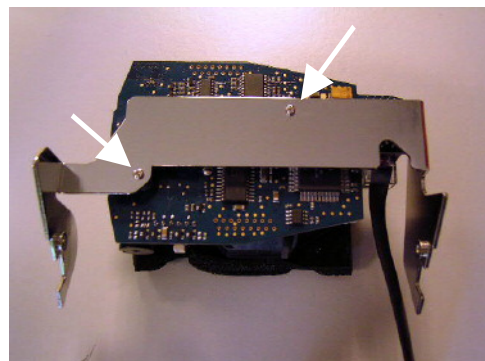

3.1.2   Scan engine

A. Loosen the two screws retaining the bracket with scan engine and remove them, disconnect scan engine cable from main board.
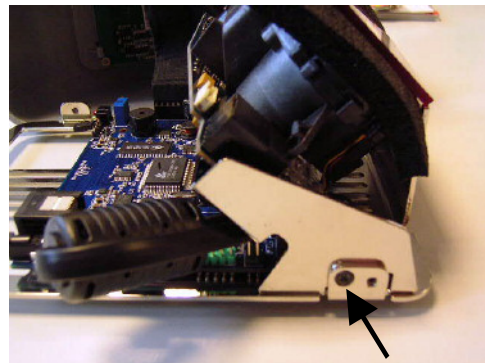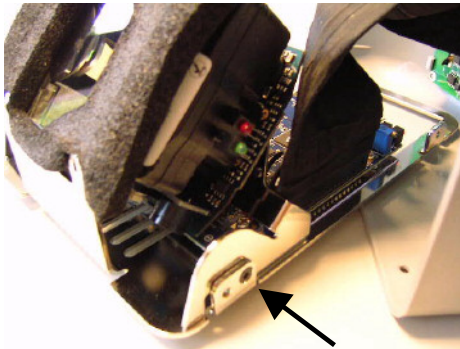
B. Loosen the two small screws retaining the scan engine and remove them.

3.1.3 Main board

A. Remove screw for wire and release display flat cable from main board.

B. Loosen the three screws retaining the main board and remove them.
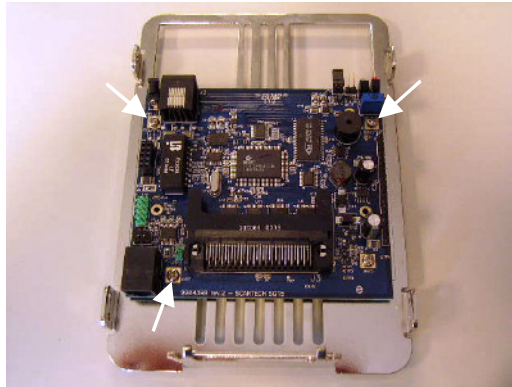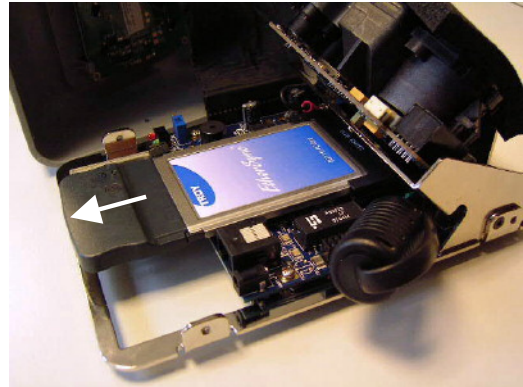

3.1.4 PoE Board

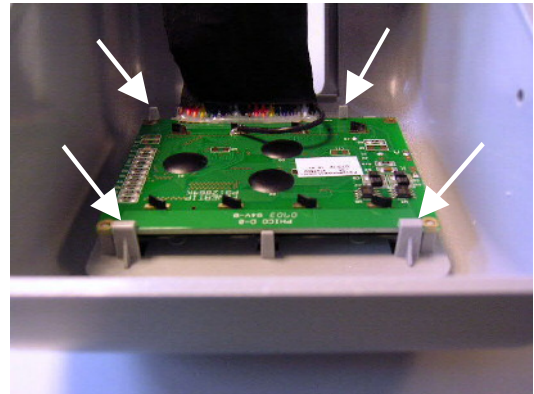Lift PoE board from three distance pieces and header.
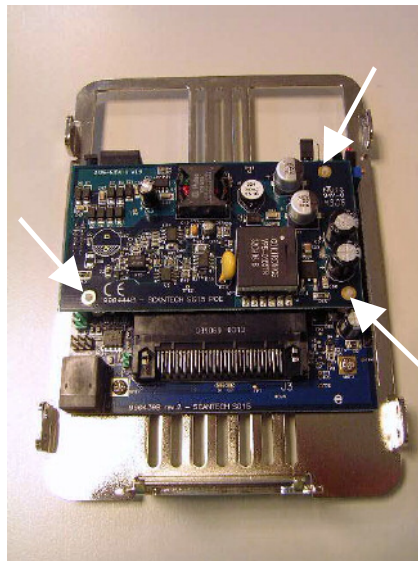
3.1.5 PCMCIA Card

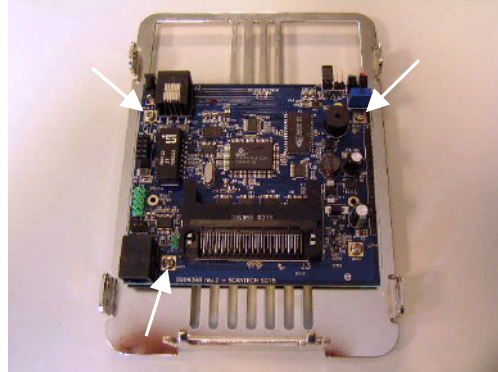Slide out the PCMCIA Card from his slot

3.1.6 Display

Remove display whilst pushing back the mounting hooks carefully.

3.2   ASSEMBLY

3.2.1 Main board

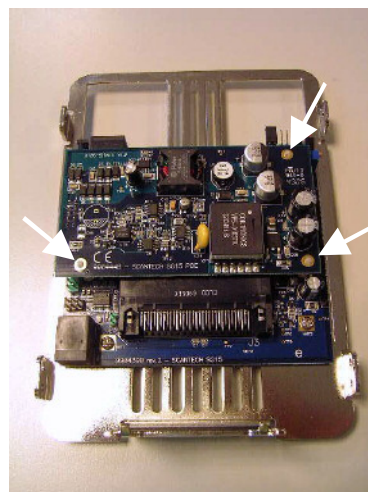Mount Main board on back plate with three screws.

3.2.2 PCMCIA Card

Slide PCMCIA card into the pre assembled slot until you feel a "click.".
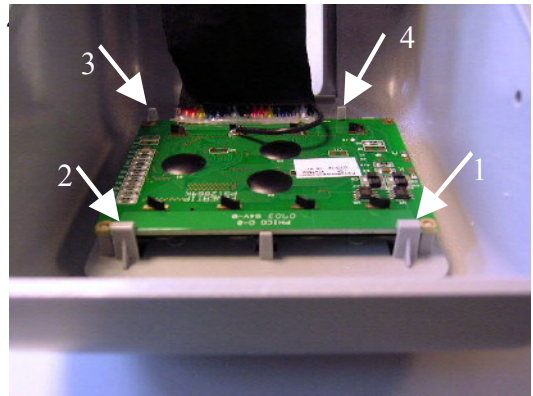

3.2.3 PoE Card

Push PoE card on the three distance pieces and push male header into the header (main board).
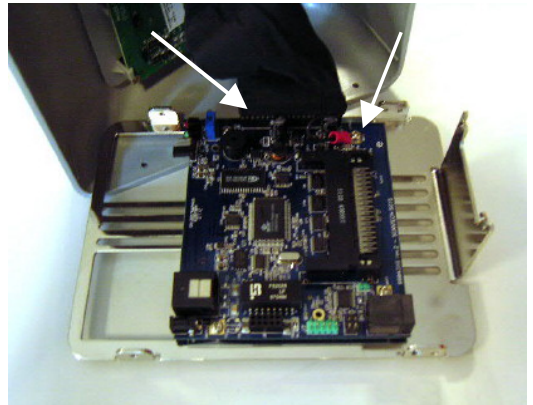
3.2.4 Display

Push Display carefully into front
housing. Start with point 1-2...4
Pay Attention for direction Display.
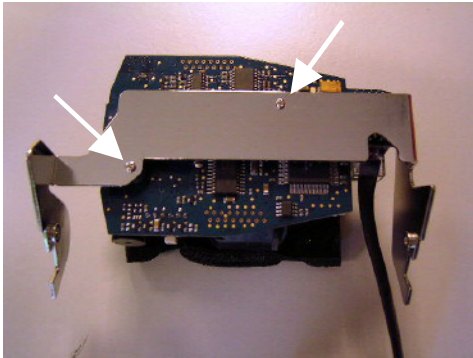

3.2.5 Front housing / Display

Mount wire first with screw and plug
flat cable on header main board.

Close front housing after mounting the
Scan Engine. See instruction 3.2.6.

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3.2.6 Scan Engine

A. Mount Scan Engine on the bracket
with two screws.
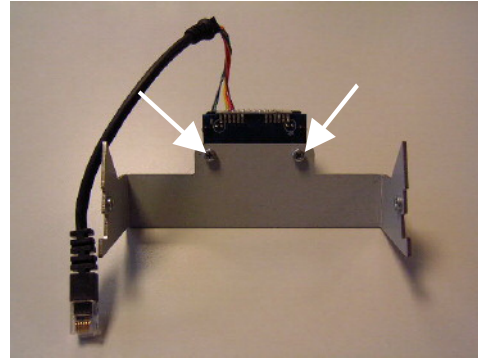
CCD Scan Engine

Omni Scan Engine

B. Place Foam on top side of the
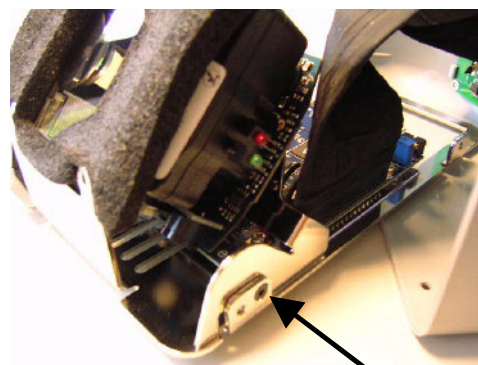Omni directional Scan Engine.

C. Mount bracket with Scan engine
back on back plate with two screws.
Connect scanner cable first into main
board.

Pay attention for foam position when
you mount bracket.
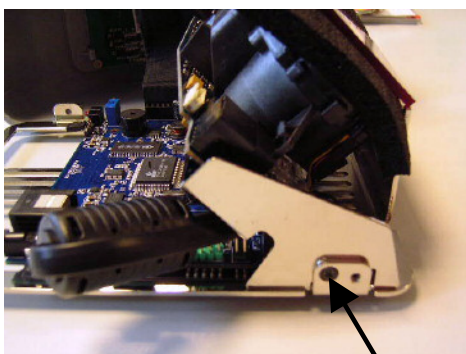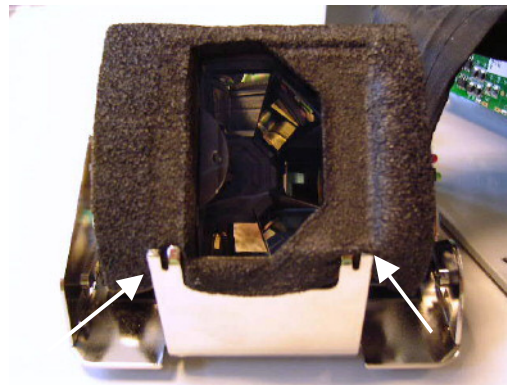
3.2.7 Closing Shuttle SG-15

Mount housing on back plate with four
screws.

Pay attention that window scanner red is placed on his position and correct direction inside the front housing.
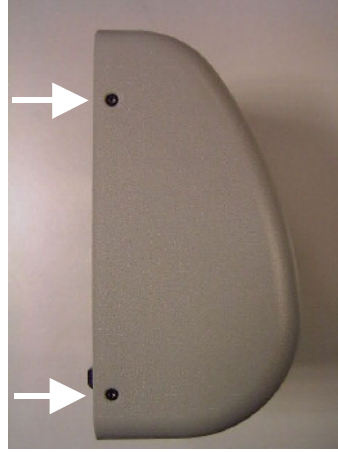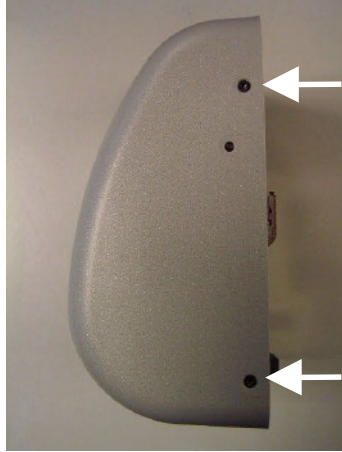
3.2.8 Adjust display contrast

After power up the Shuttle SG-15
If necessary, adjust the contrast of the display by trimming the regulator through the small hole on the side, with a small screwdriver
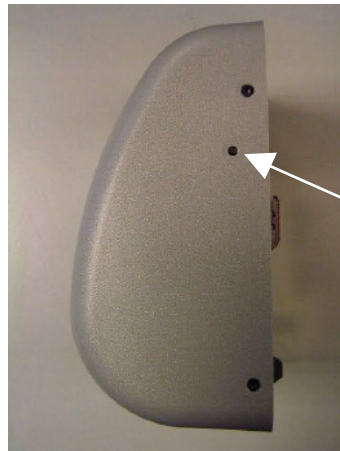
Chapter 4 Configuring the Shuttle

4.1 CONFIGURATION

When Main board or Scan engine (Omni directional or CCD) have been replaced the Shuttle SG-15 should be configured first before continue with successful operation.

ATTENTION

Scan Engine Omni directional direct delivered by Scantech for Shuttle SG-15 is configured with the SG-15 Omni scanner macro setting.

For information about configuration of the Shuttle SG-15 see Scantech-ID Shuttle SG-15 User's Manual chapter 5.

ATTENTION

For latest version of the Scantech-ID Shuttle SG-15 User's manual, please check the Scantech-ID website.

Chapter 5 Maintaining the Shuttle

5.1 CLEANING

The Shuttle SG-15 requires little maintenance. Only occasional cleaning of the scanner window is necessary to remove dirt and fingerprints. Cleaning can be performed during operation with a non-abrasive glass spray cleaner and a soft lint-free cloth.

Clean the cover and window of the Shuttle every now and then. Take care of the following:

- Use a mild glass spray cleaner;
- Spray the cleaner on a soft, lint-free cloth;
- Wipe the Shuttle clean.

IMPORTANT
- Clean the scanner window very carefully. It is scratch sensitive.

IMPORTANT
The exterior of the Shuttle should NOT be cleaned with cleaners containing:
- Aromatic hydrocarbons
- Chloride
- Acids, oxidizing agents
- Abrasives
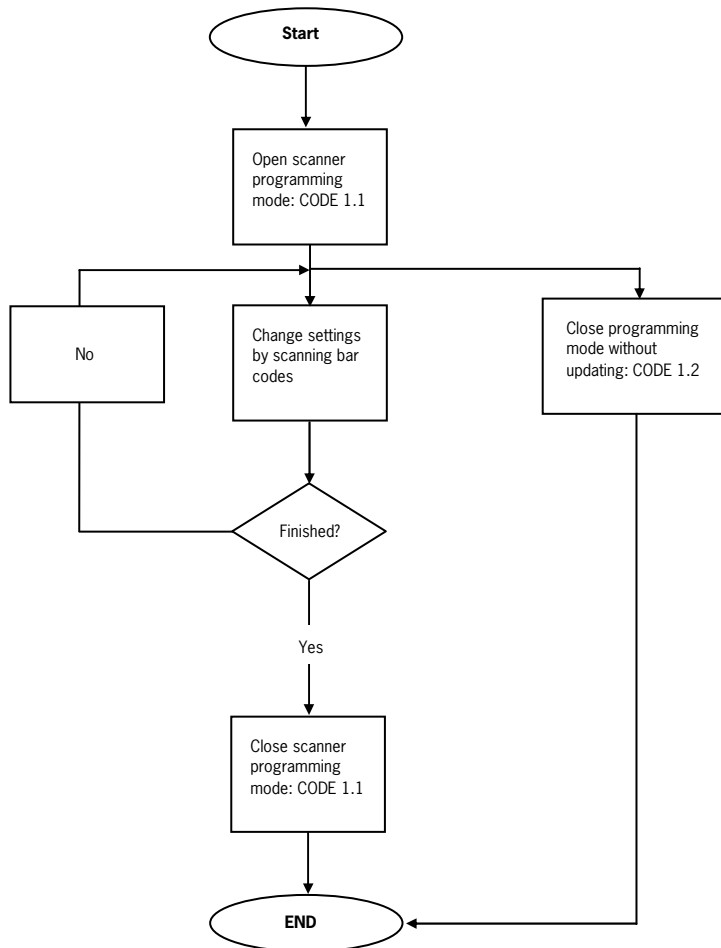- Other aggressive cleaners

Appendices

Appendices

A   BARCODE SET UP (OMNI DIRECTIONAL SCANNER)

To change the parameters of the internal scanner, follow the flow-chart shown in this section.
Note: Only valid for the Omni directional scanner.

```
                    ┌──────────┐
                    │  Start   │
                    └────┬─────┘
                         │
                         ▼
              ┌────────────────────┐
              │ Open scanner       │
              │ programming        │
              │ mode: CODE 1.1     │
              └─────────┬──────────┘
                        │
   ┌──────────┬─────────┼─────────────────────┐
   │          │                                │
┌─────┐  ┌────────────────┐          ┌────────────────────┐
│ No  │  │ Change settings│          │ Close programming  │
│     │  │ by scanning bar│          │ mode without       │
│     │  │ codes          │          │ updating: CODE 1.2 │
└──┬──┘  └────────┬───────┘          └─────────┬──────────┘
   │              │                            │
   │              ▼                            │
   │         ╱─────────╲                       │
   └────────▶ Finished?                        │
             ╲─────────╱                       │
                  │                            │
                 Yes                           │
                  │                            │
                  ▼                            │
         ┌────────────────┐                    │
         │ Close scanner  │                    │
         │ programming    │                    │
         │ mode: CODE 1.1 │                    │
         └────────┬───────┘                    │
                  │                            │
                  ▼                            │
             ┌─────────┐                       │
             │   END   │◀──────────────────────┘
             └─────────┘
```
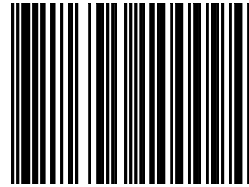
Procedure for programming with bar codes.

Bar Codes To Program the Omni-directional Scanner
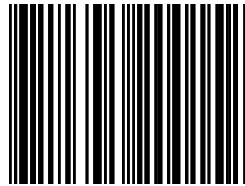
Open Programming Mode
and close (with update)
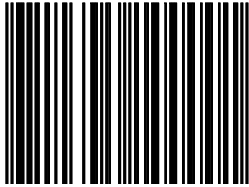
Exit programming mode
without update

1.1

1.2

SG-15 omni-scannner macro settings:

This macro programming bar code will set the
following scanner parameters in one stroke:
Serial settings:9600,8,n,1,no handshaking
Beeper: Off
Sleepmode: Off
Postamble: CR
Code ID = on

Note: For configuration Bar Codes see Shuttle SG-15 User's Manual.

B   FACTORY DEFAULT SETTINGS

Currently, the default settings concern the following settings:

IP Address	192.168.3.227
Subnet mask	255.255.255.0
Default Gateway	192.168.3.250
IP Address Remote Host	192.168.3.32
DHCP	Disabled
TCP Port	9101
UDP Port	9000
Baudrate internal scanner	9600
Minimal Scanning interval	500 mSec
Connect Mode	TCP Server
Wait for host after scanning barcode	3 seconds
Display Message Timeout	5 seconds
Font codepage	Codepage 852
Device Name	SG15_SHUTTLE
WiFi mode	Infrastructure
WiFi Adhoc channel	1
WiFi WEP key	0000000000000
WiFi SSID	pegasus
WiFi Authentication	open/none

C   SPARE PARTS LIST

This list is applicable for Shuttle with part number: A37x10x (Ethernet).
                                                               A37x20x (Wireless Lan).
                                                               A37x30x (Power over Ethernet PoE).

Part Name	Part Number
Scanner Engine Omni directional	S050201
CCD scan module	S280300
Main board	E371401
Display	E371402
PoE module	E371404
WIFI card (802.11b)	E371405
Power Supply	A051501
Front housing, black incl. Window	E371201
Front housing, silver incl. Window	E371202
Front housing, red incl. Window	E371203
Shuttle SG-15 Support CD-Rom	A372002
Window scanner (red)	E371102

- Always specify the Shuttle Serial Number and Part Number while ordering.

D　　TECHNICAL SPECIFICATIONS

Shuttle SG-15

Electrical	
Power supply voltage	100-240 Vac 50/60 Hz or Power over Ethernet IEEE 802.3af (optional)
Power consumption	3 - 5 Watt (5.2Vdc, 580- 950 mA). Depending on interface and scanner type.
SG-15 DC input	5.2 Vdc
Interfaces	Standard Ethernet or 802.11b WiFi (optional)
Scanner characteristics	
Light source	Visible laser diode (630 – 670 nm) or red led
Depth of field	200 mm (= maximum reading distance)
Scan pattern	Omni directional or single line
Bar code types	EAN/UPC/JAN + Add-on
	Code 128, EAN 128, Code 39 (+ full ASCII), Code 32, Code 93, MSI/Plessey, Codabar, Interleaved 2/5
Physical	
Dimensions	183 (h) x 132 (w) x 95 (d) mm
Display	High-bright blue-white 128x64 pixels
Housing	PC/ABS
Environmental	
Operating temperature	0°C … 40°C
Humidity	20% .. 95% RH (non condensing)
Safety	
Laser Safety Electrical Safety	IEC 825-1 (1993) Class I, U.S. 21CFR1040 Class IIa EN 60950 (1992), IEC 950 (1991), UL1950 3rd edition, c-UL(CSA-C22-2 950-M95)
EMC	EN 61000-6-3 (2001) Generic emission standard, from which: EN55011 (1998) Emission –Class B. EN 61000-6-2 (2001) Generic immunity standard, from which: EN 61000-4-2 (1995) Electrostatic Discharge (ESD) immunity, EN61000-4-3 (1996) Radiated Electro-Magnetic field immunity, ENV 50204 (1995) Digital radio telephones immunity, EN61000-4-4 (1995) Electrical Fast Transient (EFT) immunity, EN61000-4-5 (1995) Surge transient immunity, EN 61000-4-6 (1996) Conducted RF disturbances immunity.

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