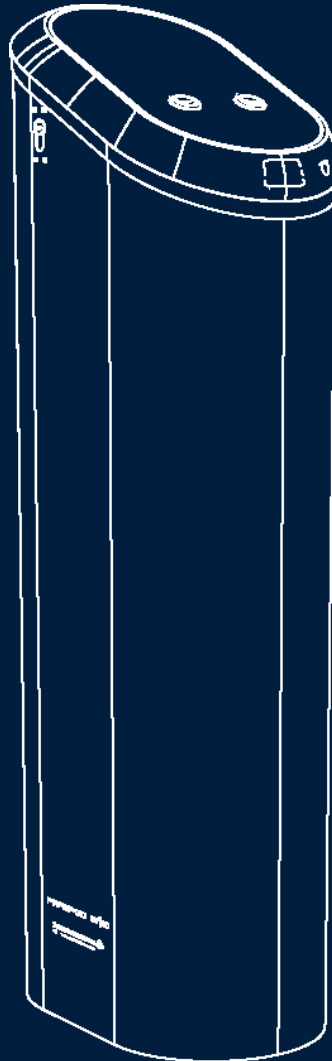


Service Manual

FareGo VAL SV|51

Ver.: 2.01

Art. No.: -



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Subject to change.

Version	Date	Change	Edit
2.00	05.02.2024	Start Version	Doll
2.01	18.11.2024	Update and minor corrections Installation revised (media converter and new base plate)	Doll

Table 1-1: History

Chapter 1 Introduction

1.1 Overview	8
1.2 Manual Organization	8
1.3 Important Warnings	9

Chapter 2 Safety

2.1 Overview	10
2.2 Safety Features	10
2.3 General Safety Guide	11
2.4 Protective Equipment	11
2.5 Special Tools	11
2.6 Storage	11
2.7 Transporting and Moving Equipment	12
2.8 Disposal of Packaging Material	12
2.9 Cautioning Words and Symbols in the Manual	12
2.10 Smart Card Reader (SCR)	13
2.10.1 Check for Manipulation of the Smart Card Reader	13
2.10.2 Scrapping	14
2.11 Device Safety Labels	15
2.11.1 Power Supply Junction Box	15
2.11.1.1 Caution Label	15
2.12 Device Labels	16
2.12.1 Column	16
2.12.2 Base Unit	16
2.12.3 Power Supply Junction Box	17
2.12.4 TÜV SÜD Listing Label	17
2.12.5 FCC License Label	18
2.12.6 Model Number Labels	18
2.13 Declaration of Conformity	19
2.13.1 USA/CANADA	19

Chapter 3 Installation

3.1 Overview	22
3.2 Disclaimer	22
3.3 Packaging Information	22
3.3.1 Power Requirements	23
3.4 Environmental Conditions during Storage and Operation	23
3.5 Environmental Conditions for Maintenance	23
3.6 Column Variations/Conduit Entry Points	24
3.7 Mounting Options	25
3.7.1 Drilling into Concrete	25
3.7.2 Adhesive Option	25
3.8 Conduit Requirements	26
3.8.1 Side Conduit Entry	26
3.8.2 Bottom Conduit Entry	26
3.9 Dimensions and Weights	27
3.10 Installation Requirements	27
3.10.1 Location	27
3.10.2 Materials	27
3.10.3 Standard Tools	28
3.10.4 SV 51 Installation Steps	28

3.10.5	Mounting the Base Plate	28
3.10.5.1	Drilled solution.	28
3.10.5.2	Adhesive Solution	28
3.10.7	Connecting Cables	31
3.10.8	Mounting the Column to the Base Plate	33
3.10.9	Connecting and Assembling the Base Unit	34
3.11	Disassembly and Removal	35
Chapter 4 Commissioning		
4.1	Prepare Workshop EEPROM	36
4.2	Pre-Initialize Base Unit (Workshop)	37
4.3	Prepare Productive EEPROM	41
4.4	Initialize Base Unit On Site	42
4.5	How to Replace the EEPROM	43
Chapter 5 Product Description		
5.1	SV 51 Description	44
5.1.1	Components	44
5.2	Technical Data	45
5.3	Construction Material	45
5.4	Dimensions	45
5.5	Component Diagram and Logical Links	45
5.6	Base Unit of the FareGo Val SV 51	48
5.6.1	Status LED	49
5.6.2	EMV Status LED	50
5.6.3	Patron Display	51
5.6.4	Pushbuttons	51
5.6.5	Multi-Application Reader 3.0	52
5.6.6	Barcode Reader	54
5.6.7	Headphone Jack	54
5.6.8	Computer System	55
5.6.8.1	Clock	56
5.6.8.2	Software Configuration	56
5.6.8.3	Transaction Data Storage	56
5.6.8.4	Backup Memory (optional)	57
5.6.8.5	LAN Interface	57
5.6.8.6	WiFi Connectivity (optional)	57
5.6.9	Lock	57
5.6.10	Power Supply Junction Box	57
Chapter 6 Basic Administration Tool (BAT)		
6.1	Connecting a Mouse or Keyboard via USB	59
6.2	Start service mode	60
6.3	User interface	61
6.3.1	Home	61
6.3.2	Health	62
6.3.3	Version list	63
6.3.4	Service/Customer	64
6.3.4.1	Display	65
6.3.4.2	Loudspeaker	66
6.3.4.3	Barcode Reader	66
6.3.4.4	Smart Card Reader	67

6.3.4.5	Current Time	67
6.3.4.6	Battery Status	69
6.3.4.7	System Utilities	70
6.3.5	Setup	71
6.3.5.1	EEPROM Editor	72
6.3.5.2	Init	72
6.3.6	Tests	73
6.3.6.1	Device Tests	74
6.3.6.2	Guided Tests	75
6.3.6.3	Network Tests	82
6.3.7	Developer	85
6.3.7.1	SCR Update	85
6.3.7.2	Developer Settings	86
6.4	Keyboard Operation of the BAT Tool	89
6.4.1	Shortcuts	89
6.4.2	Navigation in the Menu	89
6.4.3	Navigation in View	89
6.4.4	Scrolling in View	90
6.4.5	Use of Keys in Popup Window	90
6.4.6	Use of Keys in Date Settings	90
6.4.7	Use of Keys in Time Settings	90
Chapter 7 Revenue Services		
7.1	This chapter is not required for this device type	92
Chapter 8 Preventive Maintenance		
8.1	General Maintenance and Cleaning	94
8.2	Maintenance Overview	96
8.3	Maintenance Overviews	97
8.4	Materials	97
8.5	Maintenance Procedures	98
8.5.1	Cleaning and Visual Inspection of Exterior	98
Chapter 9 Troubleshooting		
9.1	Overview	100
9.2	Verifying Software Versions	100
9.3	Error Messages on Patron Display	101
9.3.1	Out of Service	101
9.4	Error Identification	102
9.4.1	Cash Supplement Required	103
9.4.2	Cash Fare Required	103
9.4.3	Not Enough Funds, Reload Required	104
9.4.4	Card Read Error	105
9.5	Failure Identification	106
9.5.1	Blocked Card	106
9.5.2	Card Inactive	107
9.5.3	Card Error	107
9.5.4	Reversal Not Possible	108
9.6	Module Removal	109
9.6.1	Tools and Consumables	109
9.6.2	Base Unit	110
9.6.2.1	Removal	110

9.6.2.2	Replacement	111
9.6.3	Accessing the Power Supply	112
9.6.4	Alternative Procedure	113
9.6.5	Fuse Replacement	114
9.6.6	Backup MicroSD Card Removal and Replacement	115
9.7	Returning the Validator to Service	116
9.7.1	System MicroSD Card	116
9.7.2	Import Backup	116
9.7.3	New Backup MicroSD Card	117
9.7.4	Recovery Scenarios	118
9.7.4.1	Recovery Scenario 1	118
9.7.4.2	Recovery Scenario 2	118
9.7.4.3	Recovery Scenario 3	118
9.7.5	Initial Check	119
9.7.6	Turn on Power	119
9.8	ID Number of Validator	119
Chapter 10 Glossary		
10.1	Glossary of Terms and Abbreviations	120
Chapter 11 Appendix		
11.1	Additional Documents	126

Chapter 1 Introduction

1.1 Overview

The service manual provides complete, detailed instructions for maintenance technicians responsible for servicing, maintaining, and repairing the device.

Concise instructions for maintaining, troubleshooting, and repairing the device along with comprehensive charts, tables, graphs, and other diagrams provide a technical document for the device that is easy to use and understand.

The service manual also acts as a step-by-step instructional guide that can be used by technical trainers and trainees to provide or receive instructions on the device.

This manual reflects Scheidt & Bachmann's commitment to providing our Customers with comprehensive technical documentation for the device along with training guidelines to augment our customer training program.

NOTICE

This document release comprises the basic maintenance and operational instructions for the SV|51 product. The document is included in ongoing product maintenance and subject to periodic updates as product and procedural improvements are being made.

1.2 Manual Organization

The organizational structure of the Service Manual is outlined below.

- Chapter 1 - Introduction
- Chapter 2 - Safety
- Chapter 3 - Installation
- Chapter 4 - Commissioning
- Chapter 5 - Product description
- Chapter 6 - Service Commands
- Chapter 7 - Revenue Service
- Chapter 8 - Preventive Maintenance
- Chapter 9 - Troubleshooting (and Remedial Maintenance)
- Chapter 10 - Glossary
- Chapter 11 - Appendix

1.3 Important Warnings

The following specific warnings and instructions must be followed.

NOTICE

Please read this manual and all referenced documents carefully before attempting to install or maintain this device. Failure to follow the instructions in this manual and the instructions or notes in the installation drawings may cause injury to yourself or damage the equipment and ultimately compromise the operability of the equipment.

- All Automated Fare Collection (AFC) equipment is TÜV-SÜD-NRTL (Technischer Überwachungsverein-Süd-Nationally Recognized Testing Laboratory) listed. To continue to be compliant with TÜV-SÜD-NRTL requirements, please note that the following items need to be performed during installation:

The equipment will remain TÜV-SÜD-NRTL compliant only if the mounting and wiring are also TÜV-SÜD-NRTL compliant. Please take great care during installation to comply with TÜV-SÜD-NRTL and NEC (National Electrical Code) requirements.

- Ensure compliance with all Safety Regulations and Safety Recommendations.

Although this manual has been prepared with great care, some information may seem unclear. If so, please feel free to contact us with your remarks or questions.

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Disclaimer

NOTICE

Scheidt & Bachmann Fare Collection Systems GmbH is not liable for injuries to any person or damage to the Equipment resulting from failure to comply with the manufacturer's instructions or documentation. This disclaimer includes all third party documentation prepared by OEMs and provided as a courtesy by Scheidt & Bachmann Fare Collection Systems GmbH. to its customer.

Chapter 2 Safety

2.1 Overview

This chapter deals with safety. It provides information and instruction on the safe handling, maintenance and repair of Scheidt & Bachmann fare collection equipment.

NOTICE

Please read this manual and all referenced documents carefully before attempting to work with this equipment. Failure to follow these instructions may cause injuries or damage the equipment.

Not all of the warning labels or hazards described in this chapter are attached to each type of fare collection equipment. For example, only those labels that apply to the device, and that are required to meet certification requirements, will be found in the device. Be cautious and observant, and look for such warning labels and potential hazards.

Disclaimer

Scheidt & Bachmann USA, Inc. is not liable for injuries to any person or damage to the equipment resulting from failure to comply with these instructions or documentation. This disclaimer includes all third party documentation provided by Scheidt & Bachmann USA, Inc.. Failure to follow manufacturers instructions may invalidate any or all warranties, express or implied.

2.2 Safety Features

Safety engineering is an integral part of Scheidt & Bachmann designs. Maintenance technicians must perform maintenance and repair in accordance with industry safety standards including OSHA and other Federal, State, and local codes and regulations. Close attention to proper safety precautions is of the utmost importance. Equipment should be installed, maintained, and repaired only by trained, qualified personnel using reasonable care. Improper installation, maintenance, or repair procedures may damage the equipment or cause serious personal injury or death. This chapter should be carefully read and thoroughly understood before handling, storing or working on Scheidt & Bachmann fare collection equipment. It is the responsibility of the maintenance agency to ensure that the safety instructions in this manual are read, understood, and implemented by properly trained maintenance and service technicians. All persons who work with Scheidt & Bachmann fare collection equipment should also be trained in safety principles and their application.

2.3 General Safety Guide

All electro-mechanical devices, such as fare collection equipment, create certain risks. These risks can generally be avoided by taking reasonable care and precautions, and by following the instructions provided.

- Only qualified, trained technicians should perform maintenance or repair.
- Service technicians must read and understand all operating and service instructions.
- Turn electrical power off before opening any electrical enclosure.
- Do not operate the machine with the cover of any enclosure, or the guard or covers over any mechanism removed.
- Do not turn on the device when components are disconnected.
- Do not use the equipment for any purpose other than that for which it was designed.
- When servicing or repairing the machine, all machine control panels must be tagged in compliance with OSHA (Occupational Safety and Health Administration) Lockout/Tagout procedures to indicate that machine should not be operated.
- All branch circuits for hard wired units must be suitable for the unit ratings.
- The generally accepted rules of electric engineering as well as the generally accepted rules of mechanical engineering shall be binding for all work performed on the device!
- The device may only be opened and maintained by people who have been trained and informed in detail about all safety instructions by Scheidt & Bachmann.
- Replacement of fuses must be with equivalent type and rating.
- Never perform any interventions, modifications or changes on the device.
- There may be moving parts inside the unit. There is a risk of crushing hands and fingers. Keep hands and fingers away from moving parts.
- Only use original spare parts or parts to prevent subsequent damage.

2.4 Protective Equipment

Technicians should use care when working with solvents and other cleaning agents that may be abrasive or have a tendency to cause irritation to the skin or eyes. Read all labels and safety datasheets carefully and follow instructions for the use of protective gear (e.g. gloves, safety glasses) when working with chemicals (e.g. cleaning agents) or compressed air.

2.5 Special Tools

There are no special tools required to ensure the safety of the service technician. However, ESD (Electrostatic Discharge) protection is required for all procedures involving contact with electrostatic sensitive printed circuit boards. The use of a standard ESD Safety Wrist Strap is required when working with electrostatic sensitive printed circuit boards.

2.6 Storage

Certain types of fare collection equipment, such as ticket vending machines, gates and fareboxes should be stored exactly as they are delivered. They should not be removed from their containers or pallets until they are being installed. Hardware that is used to keep such equipment stable and immovable should be left in place until the equipment is ready to be installed.

2.7 Transporting and Moving Equipment

All fare collection equipment should be properly secured when it is being transported.

Some fare equipment is heavy and/or bulky and should be moved or lifted only with special equipment.

Manufacturer's recommendations for transport and special equipment are described in the installation chapter.

2.8 Disposal of Packaging Material

After unpacking, please dispose of all packaging material properly and in accordance with all applicable environmental regulations.

 WARNING**Risk of Suffocation by Plastic Foils!**

Plastic foils, bags, and Styrofoam parts etc. may become dangerous toys for children.

- ▶ Do not leave packaging material lying around!
- ▶ Packaging materials must be kept out of reach children!

2.9 Cautioning Words and Symbols in the Manual

The following warnings are used to indicate risks:

 DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

 CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

This refers to information or a potential risk that may lead to property damage.

2.10 Smart Card Reader (SCR)

The Scheidt & Bachmann Smart Card Reader deserves a special mention in this safety chapter.

2.10.1 Check for Manipulation of the Smart Card Reader

NOTICE

S&B Smart Card Reader Safety instruction

With every service activity it needs to be checked:

- ✓ The device housing does not have signs of tampering, opening by force, physical damage etc.
- ✓ The device identification (serial number) is correct and matches company records. In other words it needs to be checked if the device number XXXXXXXX is supposed to be installed in station/vehicle number YYYYYYYY.
- ✓ There are no unauthorized devices connected to the device, especially around the landing plane of S&B Smart Card Reader antenna. Please note that such devices can be well hidden, so their presence might only be indicated by i.e. increased thickness of some parts.
- ✓ There are no extra wires or devices soldered or connected to the S&B Smart Card Reader.

Annually it needs to be checked:

- ✓ The S&B Smart Card Reader identification (serial number) is correct and matches company records – is the S&B Smart Card Reader number ZZZZZZZZ supposed to be installed in device number XXXXXXXX?
- ✓ The SAM card identification (serial number) is correct and matches company records – is the SAM reader number AAAAAAAA supposed to be installed in reader number ZZZZZZZZ?

For more information see "SBSCR2_SecurityGuidance_LifeCycle" document. Regarding security aspects the document applies equally to SCR2 and SCR3.

2.10.2 Scrapping

 CAUTION**Risk of manipulation**

Sensitive cryptographic data could be stolen.

- Destroy the security chip.
- Send the Smart Card Reader back to Scheidt&Bachmann.

The operator is responsible for the proper compliance with these procedures.

Smart Card Readers that are classified as not feasible for further use (damaged, broken, tampered etc.) need to undergo a special operation before they are thrown away. Their security chip (TPM on the image below) must be physically destroyed beyond any possibility of repair. This is because there might be sensitive cryptographic data stored in the chip.

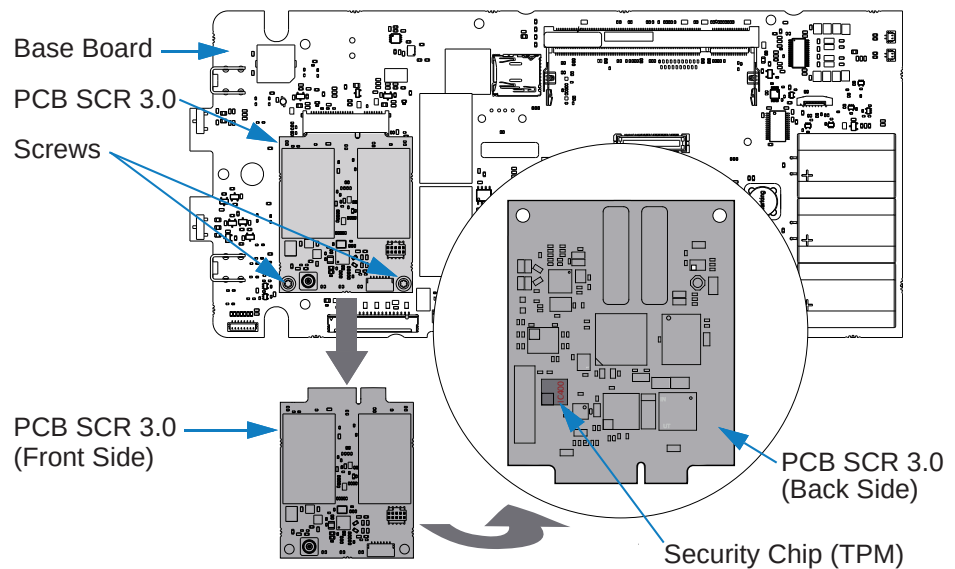


Figure 2-1 Position of the SCR3 Security Chip

A recommended way of destroying the TPM is to use a drill with a drill bit that is at least 4mm in diameter. Drilling through the chip all the way to underlying PCB (it's not necessary to go through PCB itself) shall damage it sufficiently so no cryptographic material can be retrieved.

2.11 Device Safety Labels

The device has safety labels on some internal components to alert service technicians and other personnel that a safety hazard may exist when working on certain sub-assemblies.

The following paragraphs describe these labels and note the location within the device where they will be found. It is important to read and understand this information thoroughly.

NOTICE

All safety relevant information are not to be removed, pasted or made unrecognisable in any other way.

This applies to:

- Safety Symbol Stickers
- Warning Signs
- Safety Instructions in the manual

2.11.1 Power Supply Junction Box

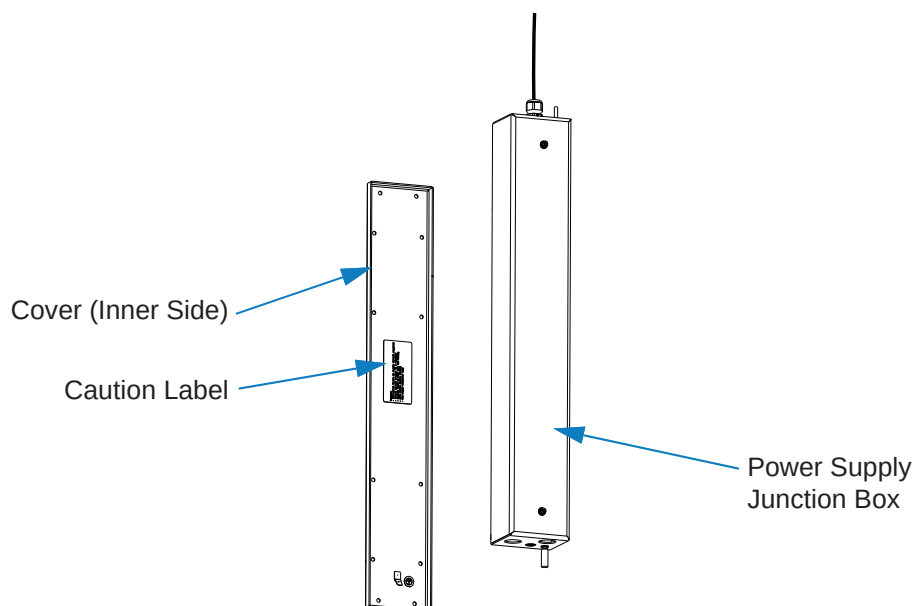


Figure 2-2 Caution Label in Cover of Power Supply Junction Box

2.11.1.1 Caution Label

Caution:

- Disconnect device in supply circuit required
- Branch circuit breaker 15 A required
- Replace fuses by same type and rating
- Read manual before install
- Use copper conductor only

Figure 2-3 Caution Label in Junction Box

2.12 Device Labels

2.12.1 Column

Figure 2-4 shows the location of the Model Number Label inside the column. The label is shown in **Figure 2-9**.

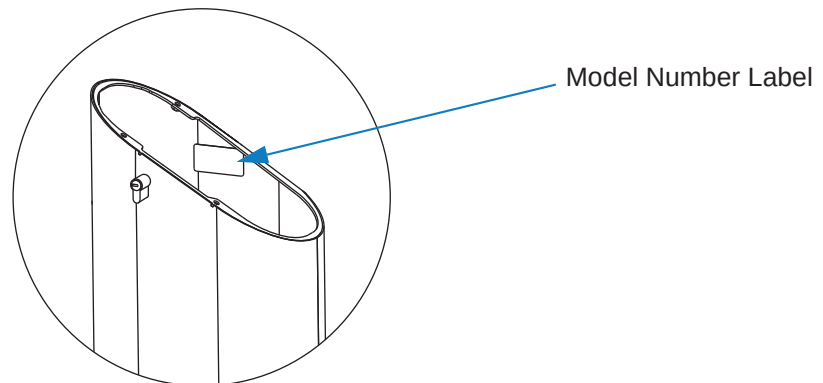


Figure 2-4 Model Number Label inside the Column

2.12.2 Base Unit

Figure 2-5 shows the location of several labels on the base unit of the device. The labels are described in **Section 2.12.4** to **Section 2.12.6**.

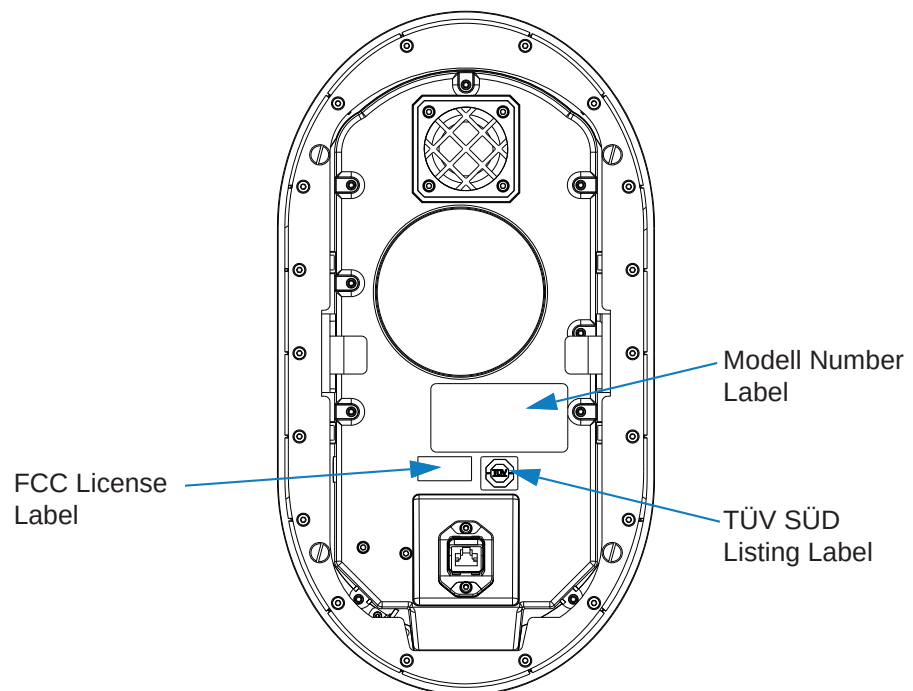


Figure 2-5 Location of Labels - Backside of Base Unit

2.12.3 Power Supply Junction Box

Figure 2-6 shows the location of the TÜV SÜD Listing Label on the power supply junction box. The label is described in **Section 2.12.4**.

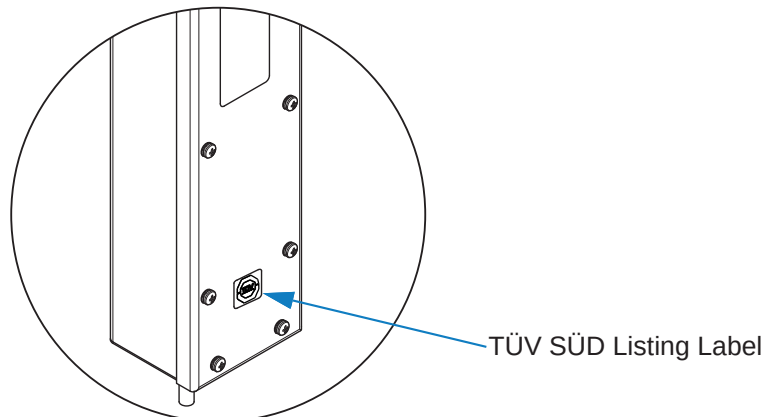


Figure 2-6 Location of TÜV SÜD Listing Label on Power Supply Junction Box

2.12.4 TÜV SÜD Listing Label

The TÜV SÜD Listing Label appears typically inside all AFC devices at the bottom of the enclosure. This label indicates that the AFC device is TÜV SÜD listed. TÜV SÜD is a Nationally Recognized Testing Laboratory (NRTL) by the Occupational Safety and Health Administration (OSHA) to test products to applicable product safety standards.

TÜV SÜD Product Service Certificate Number: U8 115133 0008 REV. 00



Figure 2-7 The TÜV SÜD Listing Label

2.12.5 Model Number Labels

The Model Number Labels shown in **Figure 2-9** are found on the backside of the device (top label), and on the backside of the base unit (bottom label). These labels indicate the drawing or part number as well as the serial number.

An index after the drawing number or part number indicates the hardware release. It will be changed in conjunction with hardware updates, i.e. index "A" will become index "B."

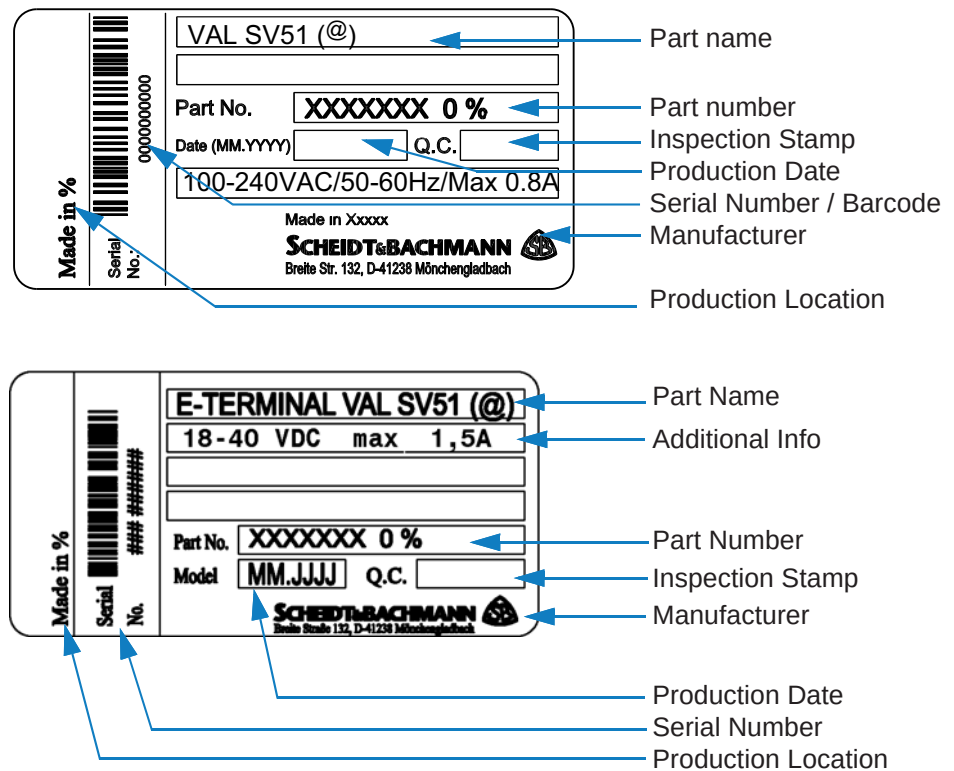


Figure 2-8 Model Number Labels (Example)

2.13 Declaration of Conformity

2.13.1 USA/CANADA

ZERTIFIKAT ♦ CERTIFICATE ♦ 認證證書 ♦ CERTIFICADO ♦ CERTIFICAT		
	CERTIFICATE	
	No. U8 115133 0008 Rev. 00	
	Holder of Certificate:	Scheidt & Bachmann Fare Collection Systems GmbH Breite Str. 132 41238 Mönchengladbach GERMANY
	Certification Mark:	
	Product:	Information Technology Equipment Stationary Validator System
	This product was voluntarily tested to the relevant safety requirements referenced on this certificate. It can be marked with the certification mark above. The mark must not be altered in any way. This product certification system operated by TÜV SÜD America Inc. most closely resembles system 3 as defined in ISO/IEC 17067. Certification is based on the TÜV SÜD "Testing and Certification Regulations". TÜV SÜD America Inc. is an OSHA recognized NRTL and a Standards Council of Canada accredited Certification body.	
	Test report no.:	713239270-05
	Date,	2022-02-02
		 (Benedikt Pulver)
Page 1 of 2 TÜV SÜD America, Inc. • 401 Edgewater Place Suite #500 • Wakefield • MA 01880 • USA		
		

Figure 2-9 NRTL TÜV-SÜD Declaration Page1

ZERTIFIKAT ◆ CERTIFICATE ◆ 認 證 證 書 ◆ CERTIFICADO ◆ CERTIFICAT



CERTIFICATE

No. U8 115133 0008 Rev. 00

Model(s): Station Validator Val SV50 (@) & E-Terminal Val SV50 (@)
Station Validator Val SV51 (@) & E-Terminal Val SV51 (@)
(@ additional suffixes for customer -ID)
VAL SV50(@) & E-TERMINAL SV50(@)
VAL SV51(@) & E-TERMINAL SV51(@)
(@) represents additional suffixes for customer ID not safety relevant

Brand Name: Scheidt & Bachmann

Tested according to: UL 62368-1:2014
CSA C22.2 No. 62368-1:2014

Parameters:

Rated Input Voltage:	
Station Validator Val SV50 (@), Station Validator Val SV51 (@), VAL SV50(@), VAL SV51(@):	100-240 VAC
E-Terminal Val SV50 (@), E-TERMINAL SV50(@):	18-43 VDC
E-Terminal Val SV51 (@), E-TERMINAL SV51(@):	18-40 VDC
Rated Frequency:	
Station Validator Val SV50 (@), Station Validator Val SV51 (@), VAL SV50(@), VAL SV51(@):	50-60 Hz
Rated Input Current:	
Station Validator Val SV50 (@), Station Validator Val SV51 (@), VAL SV50(@), VAL SV51(@):	0.8 A
E-Terminal Val SV50 (@), E-Terminal Val SV51 (@), E-TERMINAL SV50(@), E-TERMINAL SV51(@):	1.5 A
Protection Class:	
Station Validator Val SV50 (@), Station Validator Val SV51 (@), VAL SV50(@), VAL SV51(@):	I
E-Terminal Val SV50 (@), E-Terminal Val SV51 (@), E-TERMINAL SV50(@), E-TERMINAL SV51(@):	III

Page 2 of 2

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Figure 2-10 NRTL TÜV-SÜD Declaration Page2

NOTICE

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

NOTICE

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- l'appareil ne doit pas produire de brouillage, et
- l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTICE

Changes or modifications made to this equipment not expressly approved by Scheidt & Bachmann may void the FCC authorization to operate this equipment.

Radiofrequency Radiation Exposure Information:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. It also complies with Industry Canada license-exempt RSS standard(s).

The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Chapter 3 Installation

3.1 Overview

NOTICE

Please read this chapter carefully before attempting to install the devices. Failing to follow the instructions in this chapter may cause injury to yourself or damage to the equipment and may ultimately compromise the operability of the equipment.

The validator installation instructions described in this chapter explain how to install the devices, but do not prepare the devices for operation. Once installation is complete, the installer should follow the validator initialization instructions.

The following information and instructions are provided for the installer of a validator.

- To avoid damage, deliver FareGo Val SV|51 equipment to the installation location in the original packaging and Scheidt & Bachmann wrapping.
- The validator is installed in locations chosen by the Transit Authority.

NOTICE

Placement of the FareGo Val SV|51 is at the discretion of the customer.

NOTICE

The FareGo Val SV|51 equipment is fragile. Handle with extreme care. Do not drop!

Although this manual has been prepared with great care, some information may seem unclear to you. If so, please feel free to contact us with your remarks or questions.

3.2 Disclaimer

Scheidt & Bachmann is not liable for injuries to any person or damages to the equipment resulting from failure to comply with the manufacturers instructions.

3.3 Packaging Information

The following information is provided for those responsible for unpacking and installing the validator in its permanent location:

- To avoid damage, do not unpack the validator before it has arrived at the installation location.
- Disposal of packaging is not the responsibility of Scheidt & Bachmann.

3.3.1 Power Requirements

The power/network connector of the FareGo Val SV|51 is located in the mounting unit and has a full operating range from 100 VAC to 240 VAC.

A 15 A branch circuit breaker is required.

NOTICE

The safety labels shown in the section “Device Safety Labels” must be followed. Review them carefully before proceeding.

The estimated power consumption of the SV|51 is in **Table 3-1**:

Mode		Power Consumption
Standby	FareGo Val SV 51 Ready to accept Smart Card	Approximately 20 W
Operational	Smart Card processing and audio output	Approximately 38 W

Table 3-1 Power Consumption

NOTICE

Use only a defined power source in accordance to the power range specified on the serial label on the junction box.

3.4 Environmental Conditions during Storage and Operation

The environmental conditions specified in **Table 3-2** must be ensured during storage and operation.

Storing Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Temperature	-30 °C to +50 °C (-22 °F to +122 °F)
Humidity	10 % to 95 % not condensing

Table 3-2 Environmental Conditions

3.5 Environmental Conditions for Maintenance

NOTICE

Maintenance on validator equipment subject to outdoor environmental conditions should be performed ONLY if the following conditions are met:

- Temperature of the validator does not fall below -30 °C (-22 °F).
- Humidity must be between 5 % and 95 %, non-condensing.
- Rain and snow ingress during maintenance must be prevented.

These restrictions are necessary because exposure to severe environmental conditions such as cold temperatures, rain, snow, and wind, can cause serious and permanent damage to the equipment. PCBs (Printed Circuit Board) may malfunction and cease operation at temperatures below -30 °C (-22 °F). Exposure to rain or snow may lead to short circuits and resulting equipment damage.

3.6 Column Variations/ Conduit Entry Points

The SV|51 column provides two options for conduit entry (**Figure 3-1**). The first is at the bottom through the base plate. The second is through an opening provided at the rear of the SV|51 column (option). The opening has a height of 70 mm and width of 30 mm with a rounded top.

NOTICE

The figures used in this manual show various examples of base plate designs.

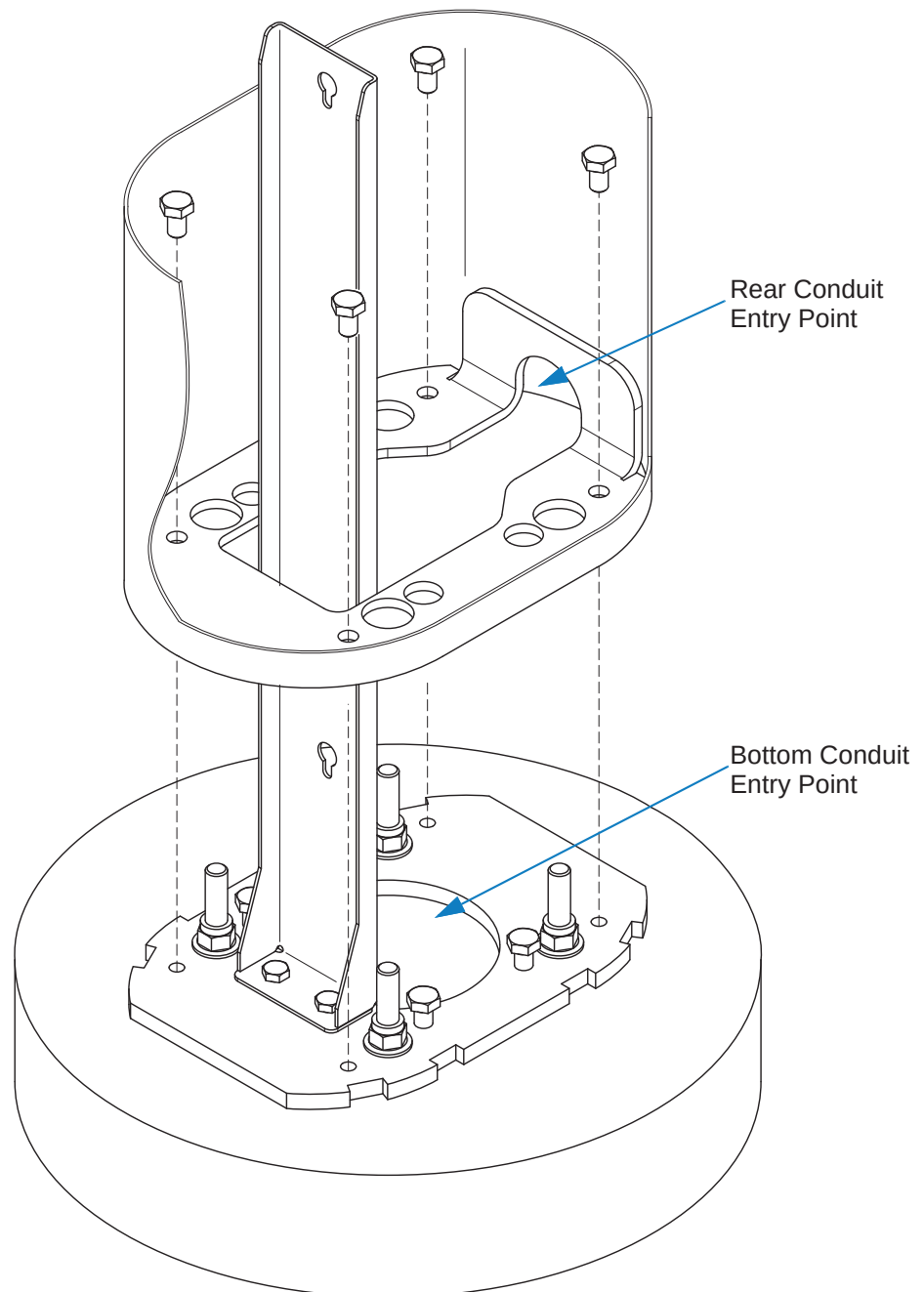


Figure 3-1 SV|51 Conduit Entry Points (Sectional View of Column)

3.7 Mounting Options

There are two ways to install the base plate of an SV|51.

3.7.1 Drilling into Concrete

This method assumes the Transit Agency prepared a concrete surface. Drilling four holes into the concrete and securing four bolts in these holes allows these bolts to hold the SV|51 in place. This method may utilize either the bottom or side fed conduit entry options.

3.7.2 Adhesive Option

The adhesive option utilizes a floor plate that has four pre-installed bolts. An industrial strength adhesive secures the plate to the platform surface and the bolts secure the SV|51 to the floor plate. This method must utilize the side entry conduit option. For locations where drilling is not permitted a floor plate will be used. The floor plate will be glued to the ground and is comprised of two components fitted together. One is a 180 mm x 180 mm steel inlay for the bolts. The other is a 700 mm x 700 mm hard coated aluminum plate (Figure 3-2).

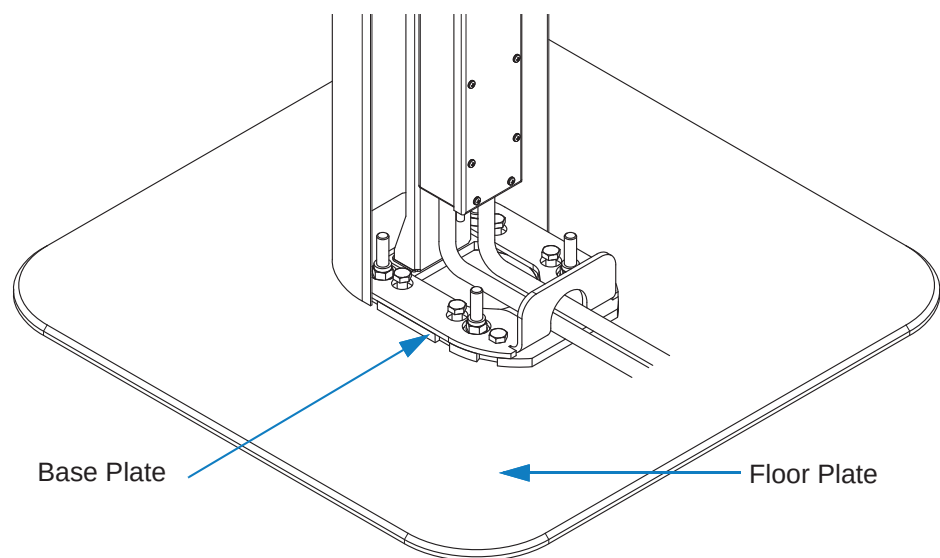


Figure 3-2 Floor Plate for Adhesive Option (Sectional View of Column)

NOTICE

By selecting the adhesive option a floor plate is utilized which may pose a tripping hazard for SV|51 device users. The floor plate is designed with a 45 degree beveled edge with a total height of 10mm. The final height of the floor plate will be determined based on the type and amount of glue applied to the mounting area to secure the floor plate to the ground.

NOTICE

Ensure stable and even ground!

3.8 Conduit Requirements

Before SV|51 installation begins, the following requirements must be met:

- Power and data cabling run in separate conduits to the identified installation location. The size of the conduit at the installation location may be no larger than 12.7 mm diameter.
- The power cabling must run from a determined power source.
- Data cabling run from the GO Transit network rack. The data cabling at the SV|51 device end must be outdoor rated CAT 5e SFTP cable. Termination is to a clamp inside the SV|51's power supply. The ground at the identified installation location must be level and free of obstructions.

Both the bottom and side fed conduit entry options are to use a 12.7mm water tight flex conduit. This will allow the device installers on site to align the conduit with the bottom openings of the power supply junction box inside the SV|51 column.

3.8.1 Side Conduit Entry

Both power and data conduits must feed into the SV|51 column through the entry point at the rear of the column (**Figure 3-2**). The conduit lengths must be a minimum of 300 mm from rear entry point of SV|51 column. A minimum length of 470 mm of power cable and 770 mm of data cable must be available from the rear entry point of the SV|51 column.

3.8.2 Bottom Conduit Entry

Both power and data conduits must feed into the SV|51 column through the hole in the SV|51 baseplate (**Figure 3-3**). The conduit lengths must be a minimum of 130 mm from bottom of SV|51 column. A minimum length of 300 mm of power cable and 600 mm of data cable must be available from the bottom of SV|51 column.

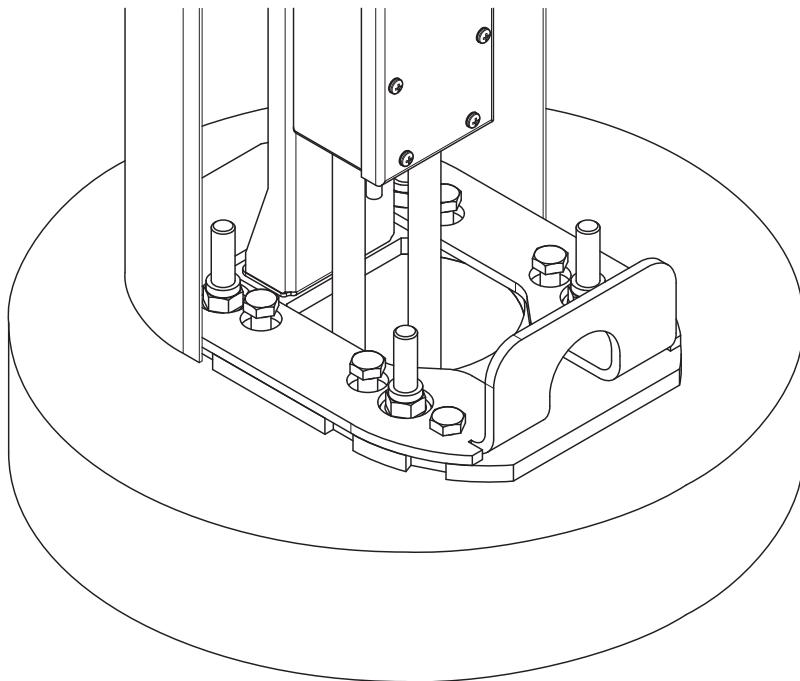


Figure 3-3 Bottom Conduit Entry (Sectional View of Column)

3.9 Dimensions and Weights

Table 3-3 lists the dimensions and weights of the validator.

Part	Width	Height	Depth	Weight
Base Unit	200 mm 7.87"	1130 mm 44.49"	320 mm 12.60"	approx. 25 kg approx. 55 lb

Table 3-3 Dimensions and Weights

3.10 Installation Requirements

The following preconditions, materials and tools are required for FareGo Val SV|51 installation.

3.10.1 Location

Sufficient space shall be ensured around SV|51 to provide access for service and maintenance and for the passengers. These distances are the following:

- On the left side: minimum 150 mm. Access to the cylinder lock with a key.
- At the back side: minimum 60 mm, for moving the head unit in course of insertion and removal.

3.10.2 Materials

At a minimum, the following materials will be included in the FareGo Val SV|51 package:

The items in **Table 3-4** will be included as part of the SV|51 Bill of Materials.

Qty	Part Name	S&B p/n
1	E-Terminal (Base Unit)	81 326710
1	Floor Plate (for adhesive solution)	03 716880
1	Lock	81 326890
1	Key	81 326900
4	Collared Hexagon Nut M12	70 037050
1	Power Supply Junction Box incl. cable with RJ45 connector (Power Supply 51813320)	03 712740
1	Power Supply Mount	03 712730
2	Screw for Power Supply Mount, M8	70 030580
2	Nut for Power Supply Junction Box, M4	70 036610
4	Hexagon Screw M10, optional if levelling is required	70 031330
4	Screw for securing column to baseplate, M10	70 014740
1	Stainless Steel Column (Housing)	81 329010
1	Base Plate	03 894140
3	End sleeve power cable (optional, for stranded power cables)	n/a

Table 3-4 Bill of Materials

3.10.3 Standard Tools

Below is a list of required tools and materials:

- Cable Cutter
- Wrench with sockets for M8, M10, and M12 hexagonal screws/nuts
- Ratchet
- Two Extended Ratchet Sockets (1 m and ≥ 23 cm)
- Bubble Level
- Sealing material for the conduit at entrance and terminal points of the power supply
- Keys

3.10.4 SV|51 Installation Steps

The following steps demonstrate how to install a SV|51. It is assumed that the conduit requirements have been met prior to the first installation step below:

- **Drilled Solution:** four bolts should be permanently fixed into holes drilled into the concrete as per the drilling pattern. The size of the bolts is M12. They should extend out of the concrete between 40 – 70 mm. The installation package includes 4 nuts for mounting the plate to the concrete.
- **Adhesive Solution:** A floor plate pre-assembled with four bolts. The installation shall utilize an adhesive to secure the floor plate to the ground.

There are only two minor differences in the installation steps for the two variations:

- The glued solution is secured at the installation site by utilizing four bolts on the floor plate, while the drilled solution is secured using four bolts drilled into concrete.
- The power and data cables can be fed through the bottom or side of the SV|51 column for the drilled solution, while these cables must be fed through the side of the SV|51 column for the glued solution.

3.10.5 Mounting the Base Plate

The front side of the base plate can be distinguished by the two screw openings in front of the conduit opening as shown in **Figure 3-4**. The front side would be the closest side to the user if they were using the SV|51 front face.

3.10.5.1 Drilled solution

Step 1

Place the base plate on the concrete; ensure the four bolts pass through the middle screw openings on the base plate.

NOTICE

Figure 3-4 highlights the four recommended bolt holes in blue. If the use of these bolt holes is not possible due to on-site conditions, the SV|51 can be fastened with only three bolts instead, using the three additional bolt holes in the base plate.

Step 2

Proceed with fixing the base plate as described for the adhesive solution in **Section 3.10.5.2** from step 2.

3.10.5.2 Adhesive Solution

- Step 1** Place the base plate on the floor plate; ensure the four bolts pass through the middle screw openings on the base plate.
- Step 2** Use a wrench to secure the base plate on the concrete/floor plate by means of a nut for each of the four bolts as shown in **Figure 3-4**.

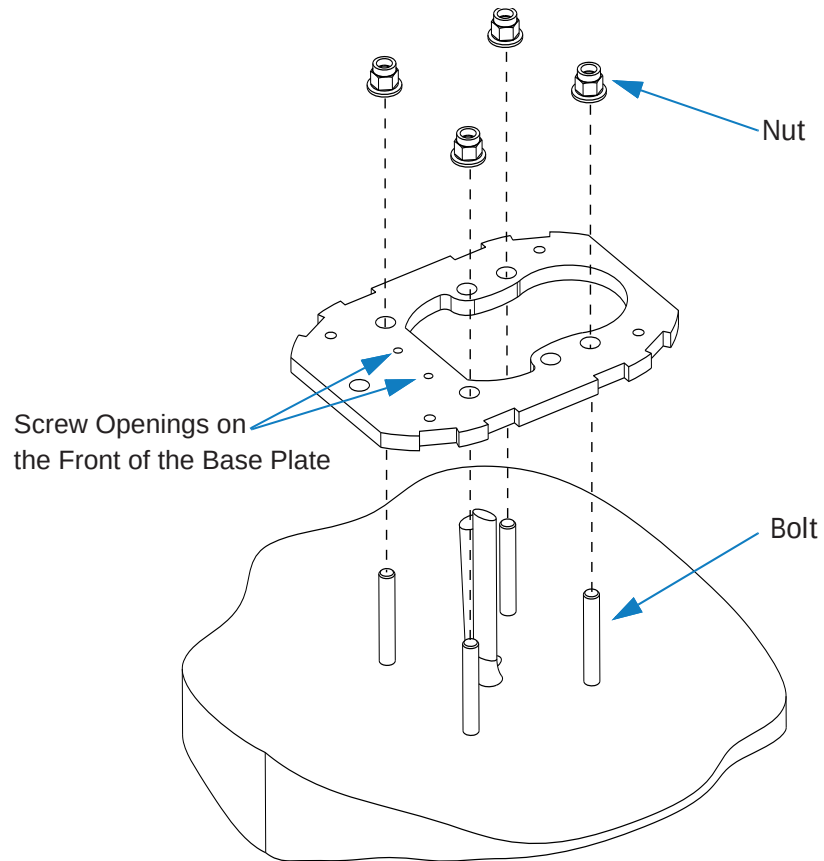


Figure 3-4 Fastening the Base Plate

- Step 3** Ensure the base plate is level by using a bubble level. Correct if necessary.

3.10.6 Attaching the Power Supply Unit to the Base Plate

The power supply unit consists of two parts: the power supply mount and the power supply junction box. The media converter is fastened outside the power supply junction box.

The power supply mount secures the power supply junction box to the base plate inside the SV|51 housing (**Figure 3-5**).

- Step 1** Assemble the power supply mount on the level base plate using two hexagonal screws and tighten.
- Step 2** Slide the power supply junction box into the slotted holes of the power supply mount using the two nuts pre-mounted on bolts on the back of the power supply junction box.

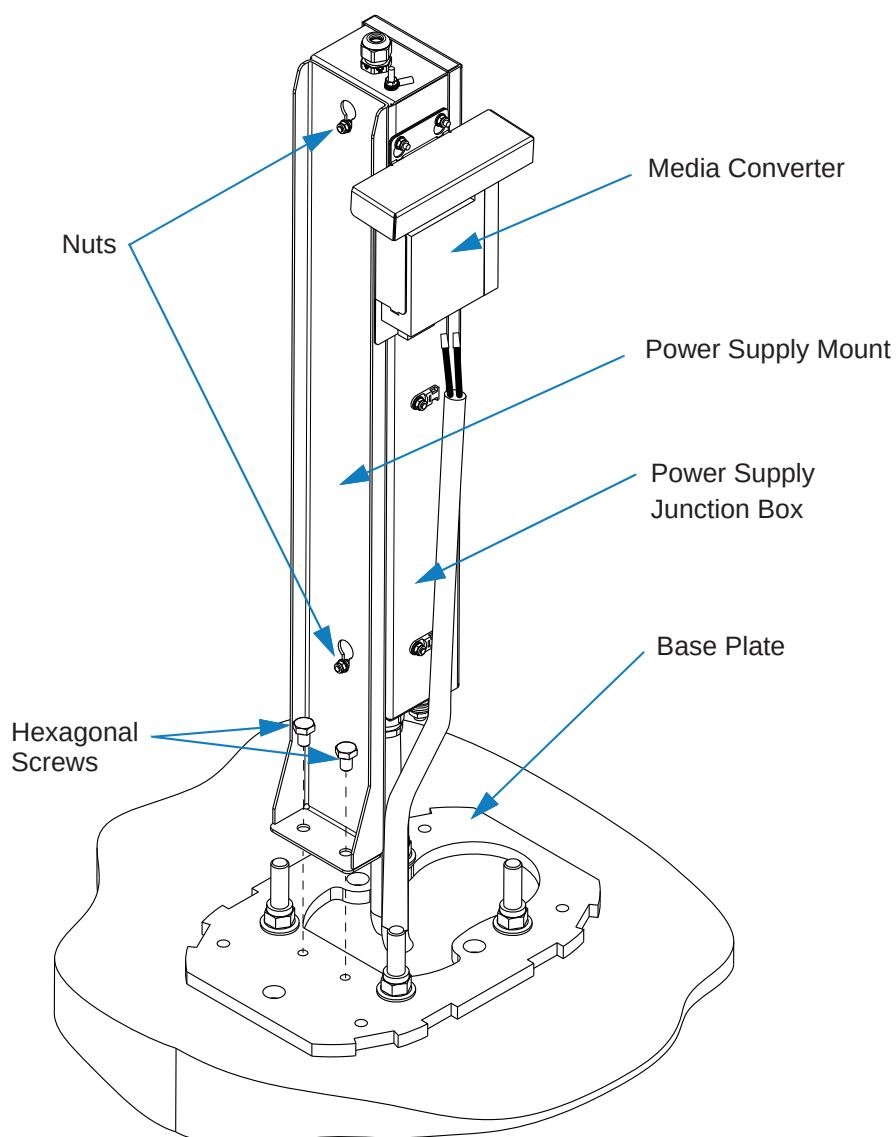


Figure 3-5 Mounting Power Supply Unit

3.10.7 Connecting Cables

NOTICE

Power Connecting Requirements:

The power supply cable has to have at least 3x1,5mm²/3xAWG14 and a circuit breaker with 15 A with at least 10kA breaking capacity in accordance to IEC standard. The cable must also comply with local requirements, environmental condition and installation method. The installing fitter is responsible for ensuring the installation is properly carried out in accordance to the standards.

- Step 1** Switch off main circuit breaker.
- Step 2** Open the Power Supply Junction Box by removing the twelve screws and the cover. Set aside the screws.
- Step 3** **Bottom Fed Conduit Entry:** Ensure the power source is passed through a conduit from the bottom of the column up to the entrance point at the bottom of the Power Supply Junction Box, see **Figure 3-6**. The data cables are passed through another conduit into the column from where they are routed outside the Power Supply Junction Box to the media converter.
- Side Fed Conduit Entry:** Ensure the power source is passed through a conduit from the back of the column up to the entrance point at the bottom of the Power Supply Junction Box. The data cables are passed through another conduit from the back into the column from where they are routed outside the Power Supply Junction Box to the media converter.
- Step 4** The installer may choose which liquid sealants and fittings to use.

NOTICE

The cable entry into the device must be mechanically strain-relieved. When the cable is pulled out, the connection of the protective earth conductor must be established / existing until the end.

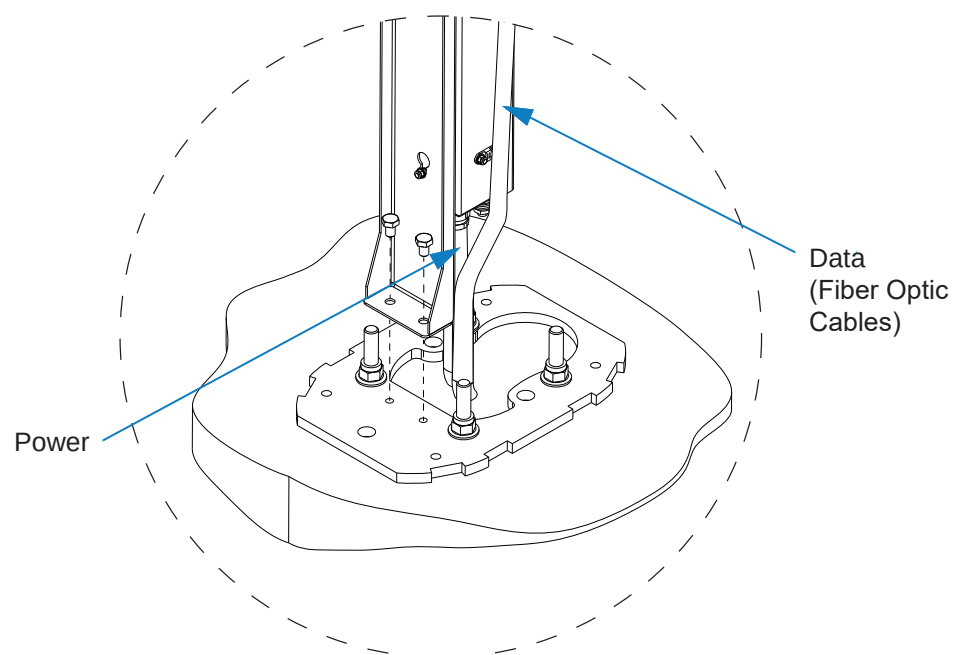


Figure 3-6 Data and Power Cables

- Step 5** Connect the power source to its respective termination points at the bottom of the Power Supply Junction Box as shown in **Figure 3-7**, Mains In.
- Step 6** Connect the fiber optic cables to the TX / RX sockets at the bottom of the media converter as shown in **Figure 3-7**, Media Converter.

The outgoing ethernet cable (TP) and the power connection of the media converter are pre-installed inside the junction box.

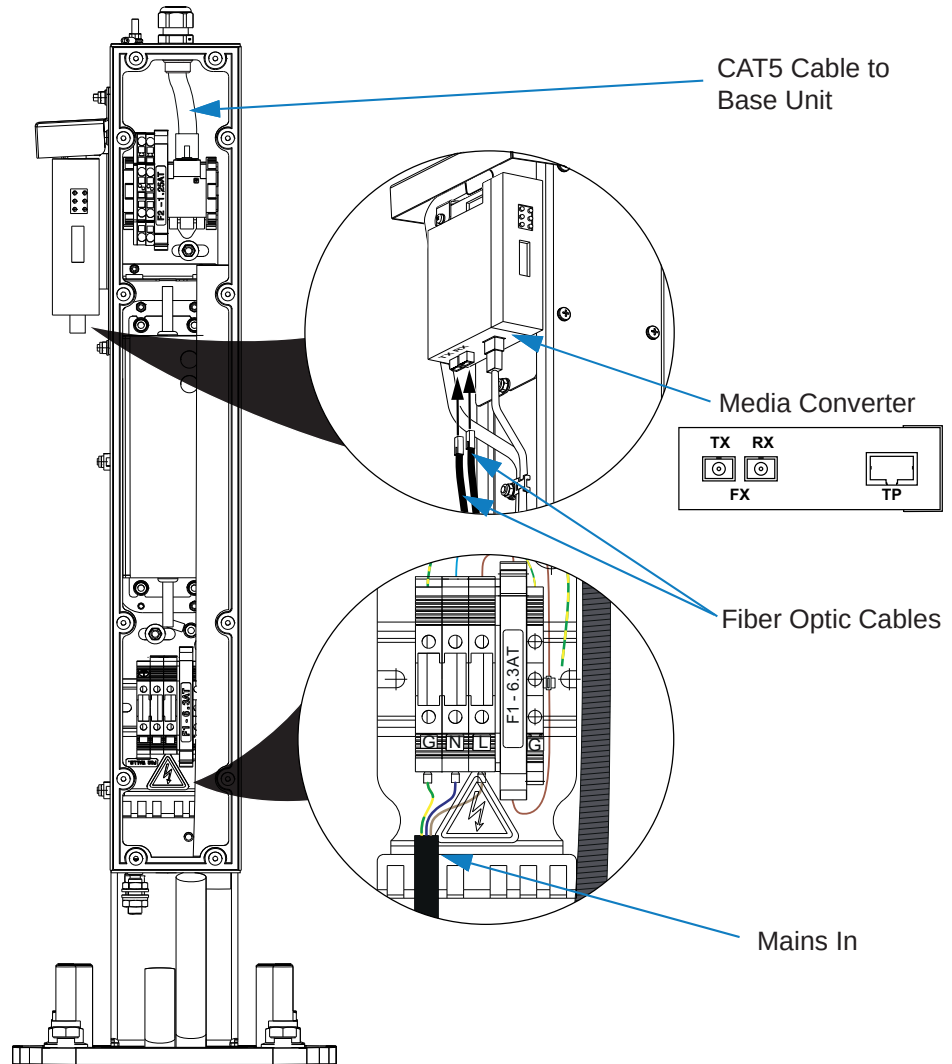


Figure 3-7 Cable Connections

The power supply inside the junction box combines the power source and data into a single output (24V DC) with an RJ Industrial 10G Ethernet Cable Termination. Note that the power supply is delivered with this Ethernet Cable already mounted (see **Figure 3-7**, CAT5 Cable to Base Unit). The other side of the pre-installed cable will be connected to the back of the SV|51 Base Unit.

- Step 7** Replace the cover of the Power Supply Junction Box and secure it using the twelve screws previously set aside.

3.10.8 Mounting the Column to the Base Plate

- Step 1** Place the column onto the base plate such that the lower side of the column aligns with the back side of the power supply unit as shown in **Figure 3-8**.

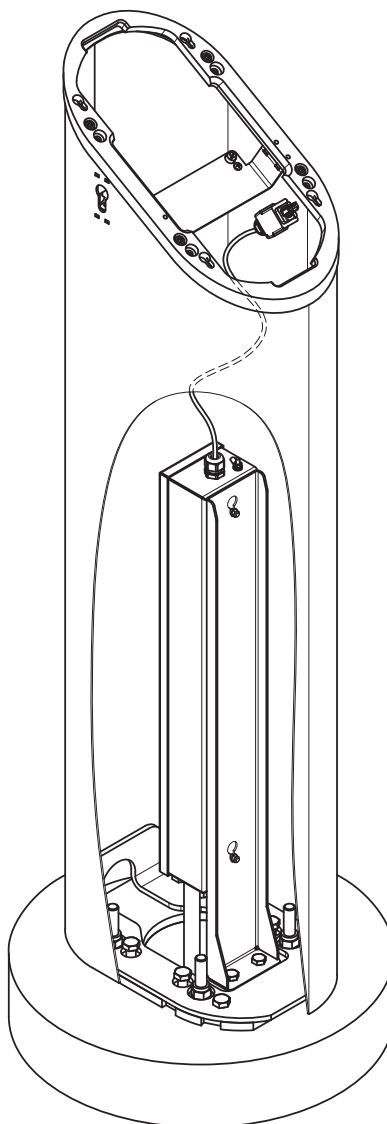


Figure 3-8 Orientation of the Column with Respect to the Power Supply Unit

- Step 2** Ensure that the four outer screw openings on the base plate are aligned with the screw openings on the welded mounting plate attached to the bottom of the column.
- Step 3** Use the extended socket and ratchet to screw the four outer bolts that secure the column on top of the base plate. For accurate leveling, the bolts need to be fastened in a crosswise order.
- Step 4** Use a bubble level to ensure that the column is indeed level.

3.10.9 Connecting and Assembling the Base Unit

- Step 1** Plug-in the RJ Industrial 10G Ethernet Cable Termination into the termination point of the base unit, see **Figure 3-9**.

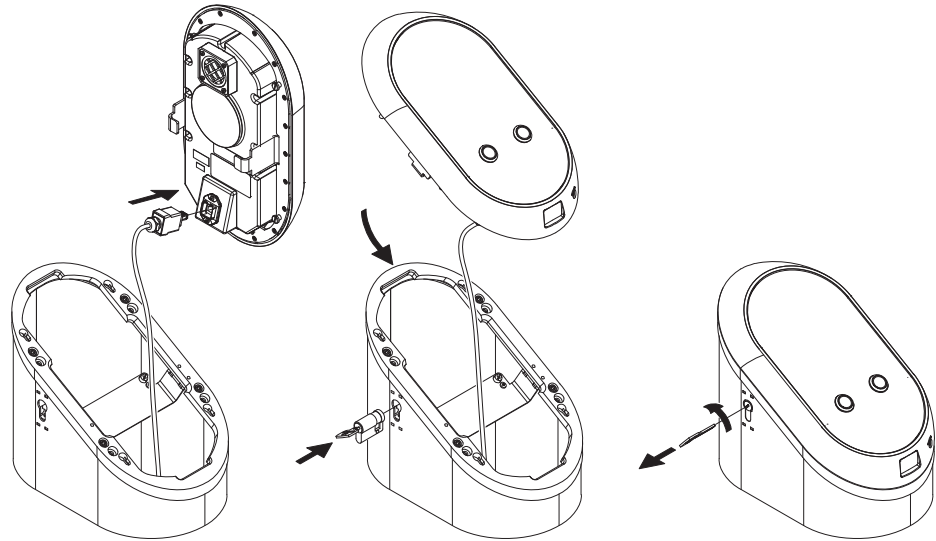


Figure 3-9 SV|51 Base Unit Assembly

NOTICE

The four mushroom screws on the back of the base unit are pre-assembled.

- Step 2** Hold the base unit on top of the adapter ring.
- Step 3** Align the four mushroom screws on the back of the base unit with the appropriate holes in the adapter ring.
- Step 4** Slide the base unit down to secure it on top of the adapter ring.
- Step 5** Put the lock into the side of the column.
- Step 6** Lock the lock using the special key provided.

3.11 Disassembly and Removal

Should it become necessary to remove the complete FareGo Val SV|51 from its permanent location, the following procedure must be followed.

NOTICE

When disassembling, observe all applicable occupational safety regulations. The regulations and instructions apply as in the installation.



WARNING

Hazardous Voltage

Touching live parts can cause life-threatening injuries.

- ▶ Make sure the power supply cables are not powered during connection activities.
- ▶ Switch OFF the station circuit breaker for the appropriate cables.

Step 1 Turn off main circuit breaker.

Step 2 Disassemble the FareGo Val SV|51 in reverse order.

Step 3 After removing the FareGo Val SV|51, the remaining cables and conduits must be removed by an authorized worker.

For questions about the disposal, please contact:

Scheidt & Bachmann USA
1001 Pawtucket Boulevard
MA 01854, Lowell
USA

Chapter 4 Commissioning

This chapter explains how to initialize the FareGo Val SV|51.

NOTICE

The screenshots used to illustrate the steps are examples. They may vary slightly depending on the version of the BAT tool in use.

4.1 Prepare Workshop EEPROM

To initialize base units in a workshop, an EEPROM (Electrically Erasable Programmable Read-Only Memory) with workshop related device data is needed.

In general, the EEPROMS are used to identify the validator's location and to assign the correct software settings that are stored in the back office system for the corresponding device.

The following steps need to be performed to program a workshop EEPROM before using it for the first time:

- Step 1** Connect a base unit that is not initialized yet to the workshop junction box which provides the power supply and the LAN connection.
- Step 2** Wait until the Basic Administration Tool (BAT) has started automatically.

NOTICE

A mouse or a keyboard must be connected to the base unit to operate the BAT tool, see **Section 6.1**.

For general information on operating the BAT tool see **Chapter 6**.

- Step 3** Open the menu in the upper left corner of the home screen, see **Figure 4-1**.
- Step 4** Select <Setup>/<External EEPROM> in the menu, see **Figure 4-1**.

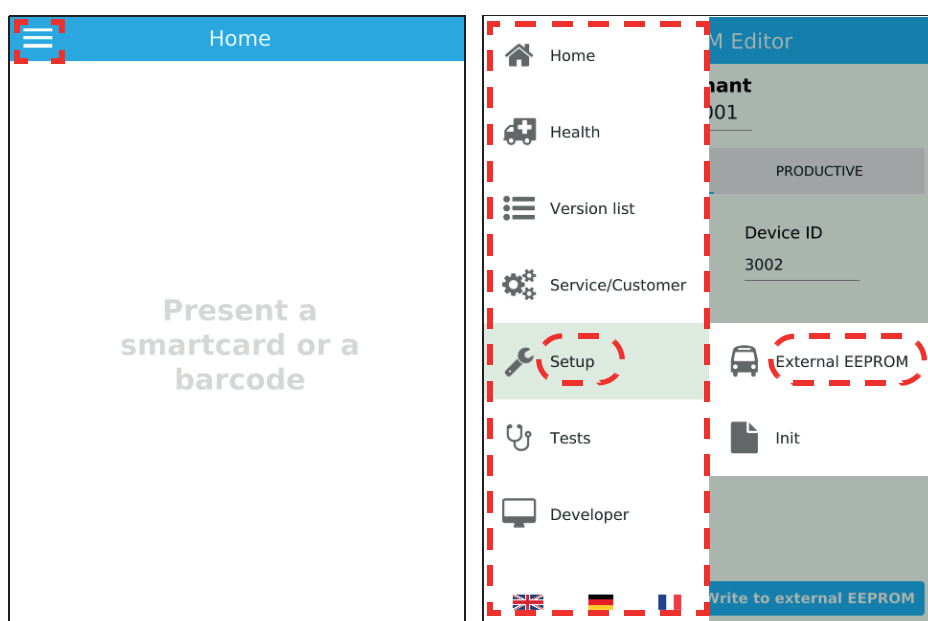
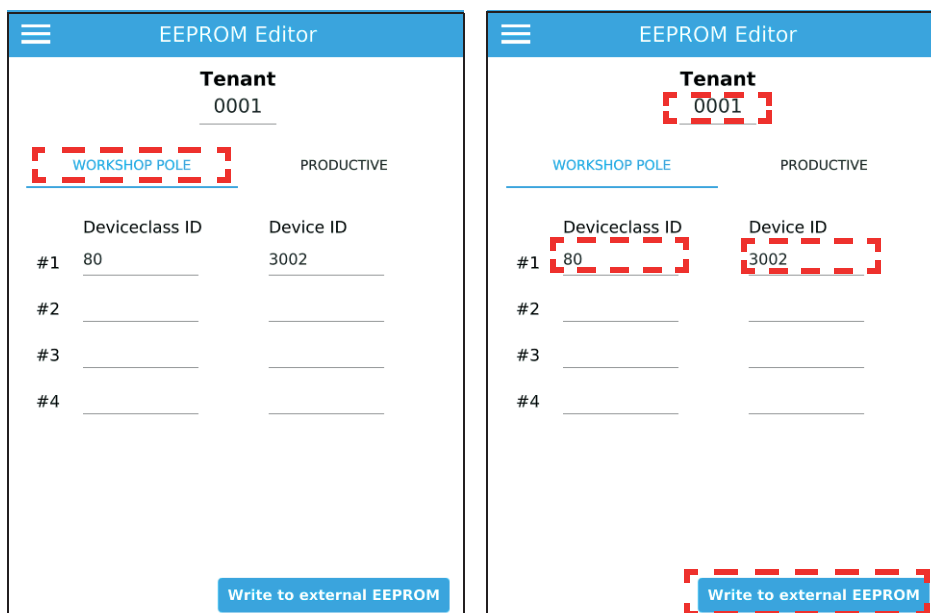


Figure 4-1 BAT - Menu, <Setup>/<External EEPROM>

- Step 5** Choose <WORKSHOP POLE> in the EEPROM Editor, see **Figure 4-2**.
- Step 6** Enter Tenant ID, Device class and Device ID.
- Step 7** Press the <Write to external EEPROM> button, see **Figure 4-2**.

NOTICE

The Tenant ID, the Device class and the Device ID are defined in FareGo Data. To get valid values for these input fields, contact the software administrator.



The figure shows two side-by-side screenshots of the 'EEPROM Editor' application. Both screenshots have a blue header bar with a menu icon and the title 'EEPROM Editor'. The left screenshot shows the 'WORKSHOP POLE' tab selected, with a red dashed box around it. The 'Tenant' field is set to '0001'. Below it, there are two columns: 'Deviceclass ID' and 'Device ID'. The first row is filled with '#1', '80', and '3002'. The other three rows are empty. A blue button at the bottom right says 'Write to external EEPROM'. The right screenshot shows the 'PRODUCTIVE' tab selected. The 'Tenant' field is also '0001'. The 'Deviceclass ID' and 'Device ID' fields are also filled with '80' and '3002' respectively. A red dashed box highlights the 'Write to external EEPROM' button at the bottom right.

Figure 4-2 BAT - Program Workshop EEPROM (Example)

- Step 8** Remove the Workshop EEPROM from the base unit, see **Section 4.5**.
The once programmed workshop EEPROM can be used for pre-initialization of any number of further base units in the workshop.

4.2 Pre-Initialize Base Unit (Workshop)

Before the base unit can be installed and initialized on site, it must be pre-initialized at the workshop.

- Step 1** Insert the workshop EEPROM prepared in **Section 4.1** to the base unit to be pre-initialized, see **Section 4.5**.
- Step 2** Connect the base unit to the workshop junction box which provides the power supply and the LAN connection.
- Step 3** Wait until the Basic Administration Tool (BAT) has started automatically.

NOTICE

A mouse or a keyboard must be connected to the base unit to operate the BAT tool, see **Section 6.1**.

For general information on operating the BAT tool see **Chapter 6**.

- Step 4** Open the menu in the upper left corner of the home screen, see **Figure 4-1**.
- Step 5** Select <Setup>/<Init> in the menu, see **Figure 4-3**.

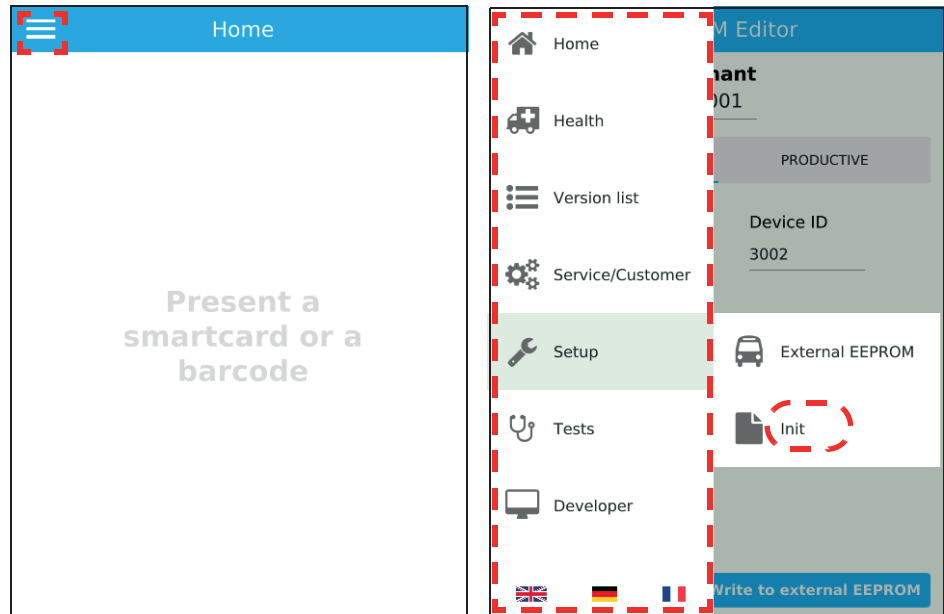


Figure 4-3 BAT - Menu, <Setup>/<Init>

- Step 6** Choose <Yukoninit> (see **Figure 4-4**), and click on <Next>.

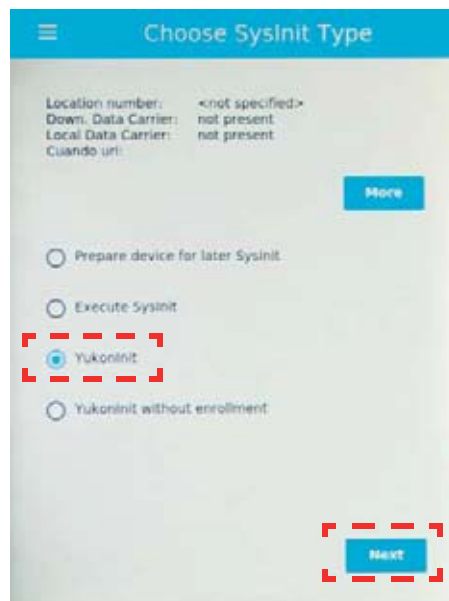


Figure 4-4 BAT - Pre-Initialization, Choose Sysinit Type

A customer certificate is downloaded.

Step 7 Press <Next> to install the certificate, see **Figure 4-5**.

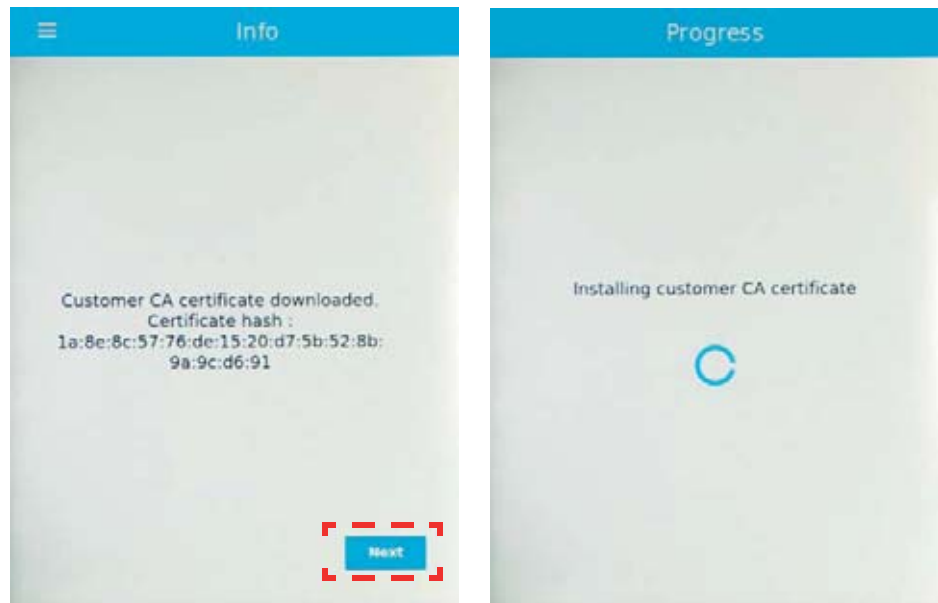


Figure 4-5 BAT - Pre-Initialization, Install Certificate

Step 8 Set login and password, and press <Next>, see **Figure 4-6**.

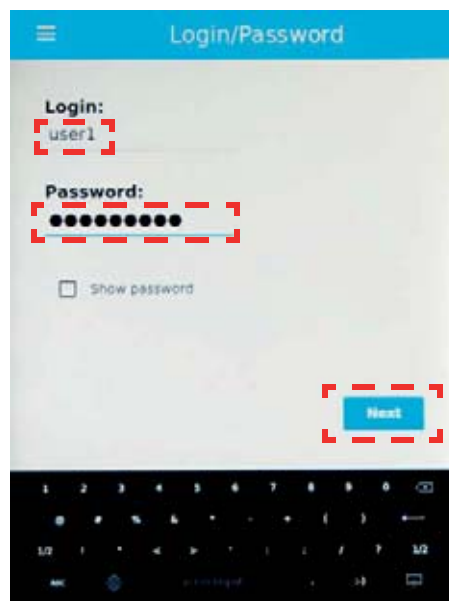


Figure 4-6 BAT - Pre-Initialization, Set Login and Password

- Step 9** Yukon updates will be downloaded. After successful download, press <Next>, see **Figure 4-7**.

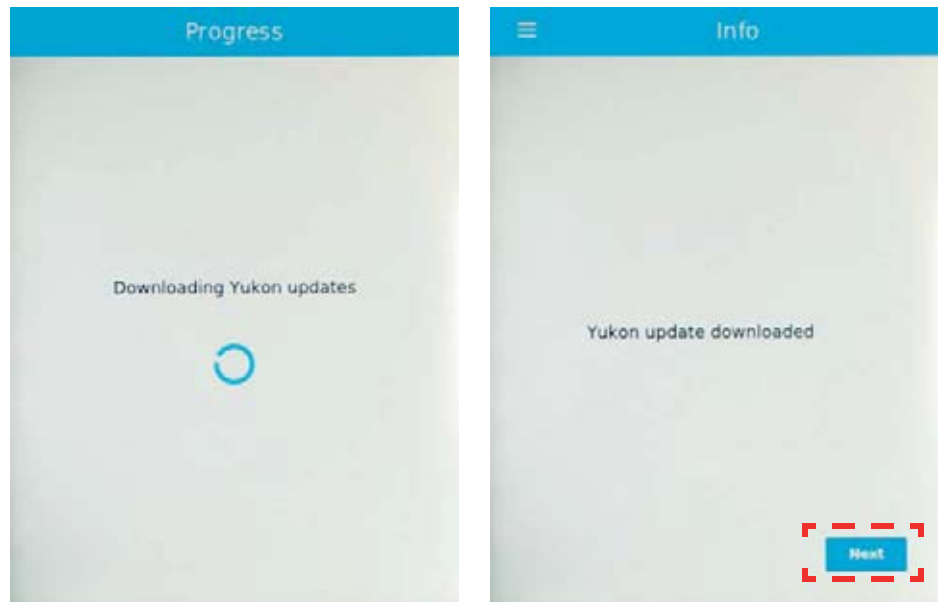


Figure 4-7 BAT - Pre-Initialization: Download Yukon Updates

- Step 10** Confirm time zone by pressing <Next>, see **Figure 4-8** (left). The Yukon updates will be installed, see **Figure 4-8** (right).

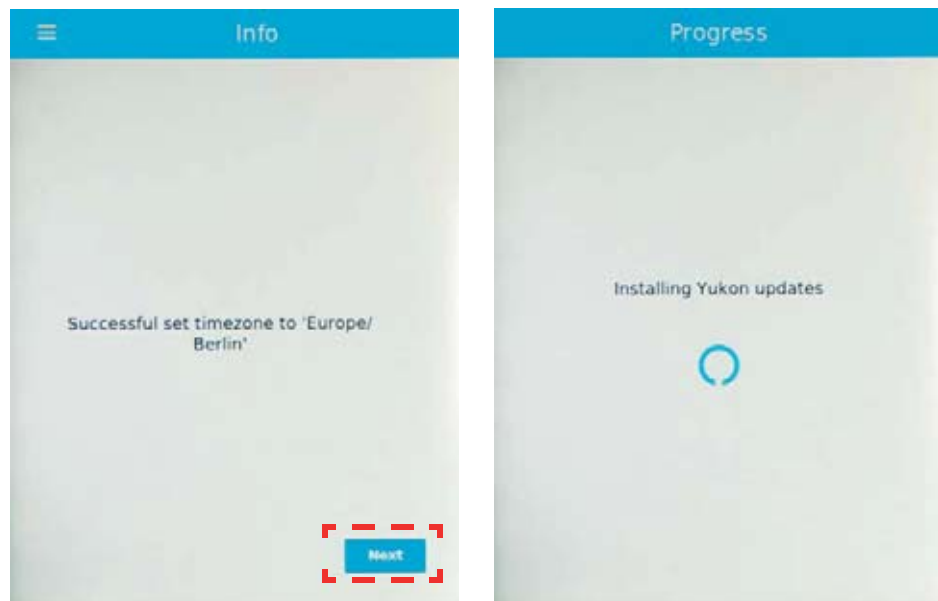


Figure 4-8 BAT - Pre-Initialization: Confirm Time-Zone, Install Yukon Updates

- Step 11** The base unit boots automatically and then displays the “Out of service” screen, see **Figure 4-9**.

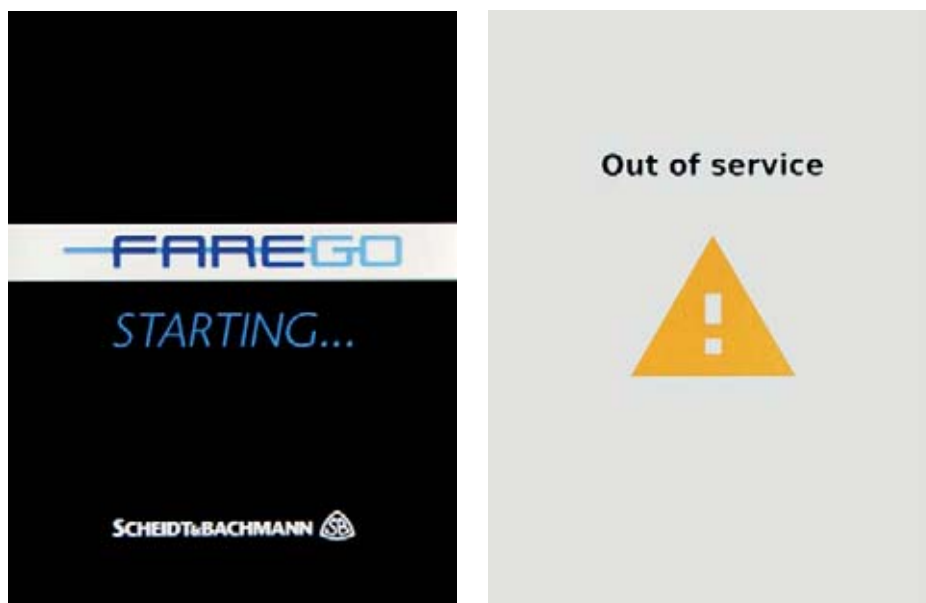


Figure 4-9 BAT - Pre-Initialization, Booting

- Step 12** Disconnect the base unit from the junction box.
The base unit now is pre-initialized.
- Step 13** Remove the Workshop EEPROM to use it for pre-initializing other base units, see **Section 4.5**.

Before final initialization on site, an EEPROM programmed with productive data must be inserted into the pre-initialized base unit, see **Section 4.3**.

4.3 Prepare Productive EEPROM

To prepare the productive EEPROM needed for the initialization on site, proceed as follows:

- Step 1** Connect a base unit that is not initialized yet to the junction box which provides the power supply and the LAN connection.
- Step 2** Wait until the Basic Administration Tool (BAT) has started automatically.

NOTICE

A mouse or a keyboard must be connected to the base unit to operate the BAT tool, see **Section 6.1**.

For general information on operating the BAT tool see **Chapter 6**.

- Step 3** Open the menu in the upper left corner of the home screen, see **Figure 4-1**.
- Step 4** Select <Setup>/<External EEPROM> in the menu, see **Figure 4-1**.

Step 5 Select <PRODUCTIVE POLE> in the EEPROM editor, see **Figure 4-10**.

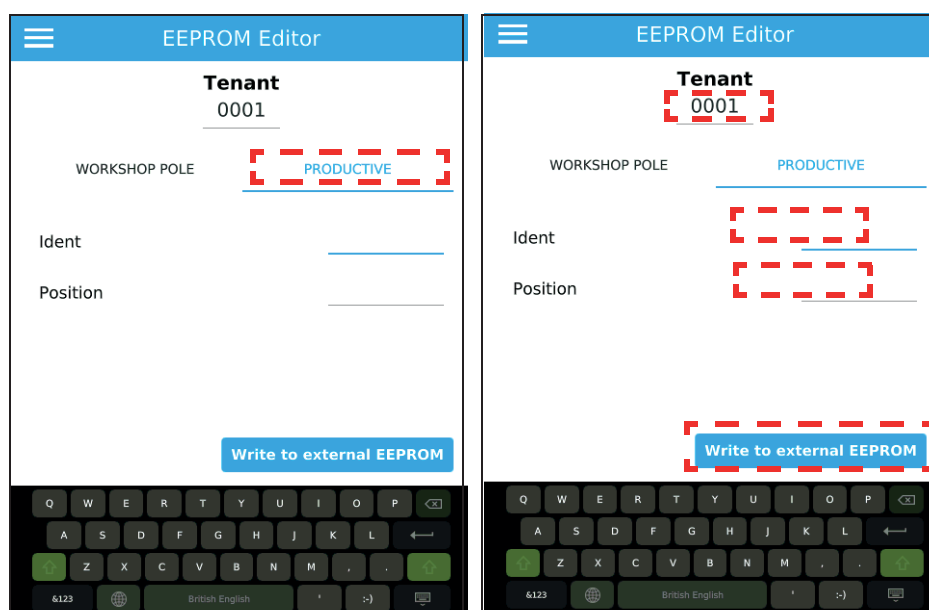


Figure 4-10 BAT - Program Productive EEPROM (Example)

Step 6 Enter the device ID ("Ident") and the position as defined in FareGo Data.

Step 7 Press the <Write to external EEPROM> button, see **Figure 4-10**.

Step 8 Remove the productive EEPROM from the base unit to use it for the pre-initialized base unit that is to be installed on site, see **Section 4.5**.

4.4 Initialize Base Unit On Site

Step 1 Before installing a pre-initialized base unit on site, make sure the productive EEPROM suitable for the location is inserted.

NOTICE

For EEPROM replacement see **Section 4.5**.

The base unit can now be finally initialized for operation:

Step 2 Mount the base unit on the already installed column of the device as described in **Chapter 3**.

Step 3 The device boots and initializes automatically with the correct software.

Step 4 The device reboots and goes into service.

4.5 How to Replace the EEPROM

During workshop preparation and commissioning on site the EEPROM that is contained in the base unit must be replaced.

For EEPROM replacement proceed as follows:

- Step 1** Open the service cover on the back of the base unit.
- Step 2** If necessary, remove the EEPROM contained, see **Figure 4-11**.
- Step 3** Carefully plug-on the EEPROM to be installed.

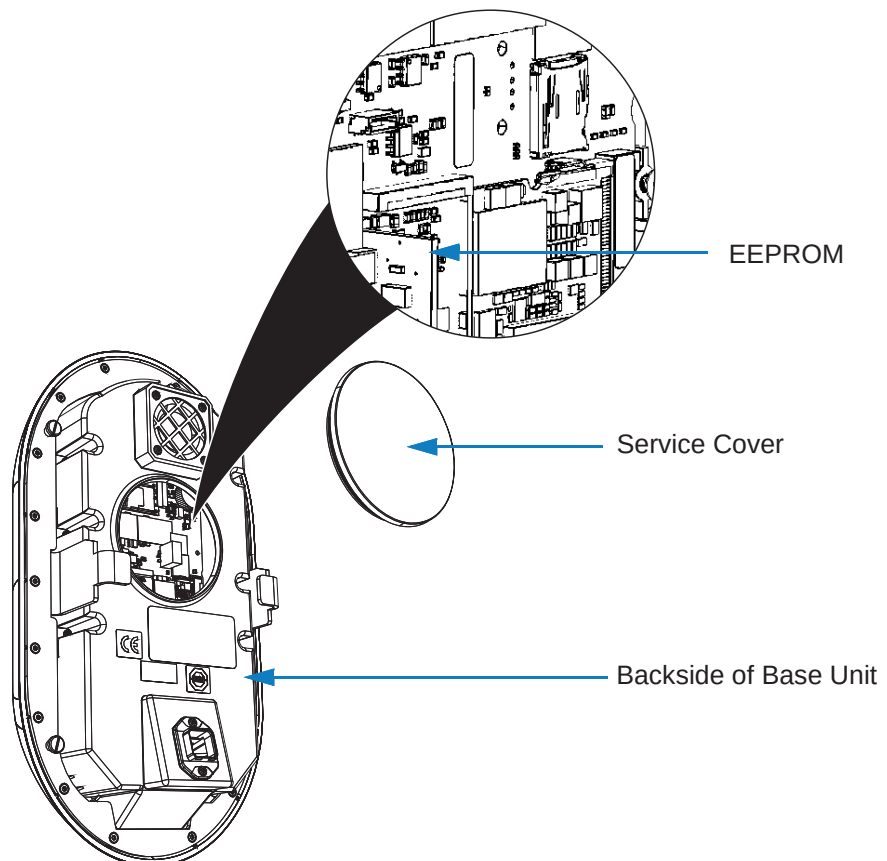


Figure 4-11 Location of EEPROM

Chapter 5

Product Description

5.1 SV|51 Description

The FareGo Sales SV|51 Station Platform Validator is a device with read and write capabilities for contactless media such as smart cards, credit cards and barcodes. The SV|51 will be floor mounted.

5.1.1 Components

The SV|51 consists of six main components as shown below (**Figure 5-1**):

- Base Plate
- Power Supply with Power Supply Mount
- Stainless Steel Column with Welded Bottom
- Adapter Ring
- SV|51 Base Unit
- Lock

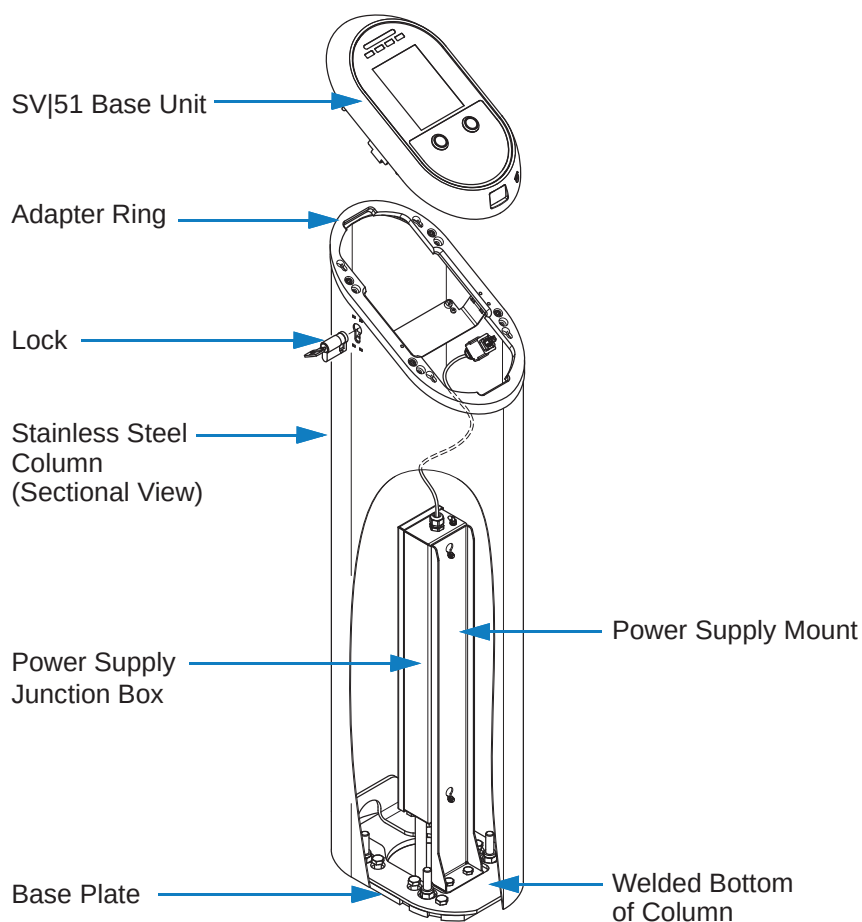


Figure 5-1 Components

5.2 Technical Data

5.3 Construction Material

The **Table 5-1** lists the materials that are used for the FareGo Val SV|51 external components.

Part	Material
Housing /Column	Polished Stainless Steel with Clear Coat
Adapter Ring	Anodized Aluminium
Base Plate	Stainless Steel
Base Unit Housing	Pry resistant, impact proof and flame retardant plastic
Base Unit Front Plate	Hardened glass

Table 5-1 FareGo Val SV|51 Housing Material

5.4 Dimensions

The **Table 5-2** lists the dimensions of the FareGo Val SV|51.

Device	Width (incl. Edge Connector)	Height	Depth
FareGo Val SV 51	200 mm 7.9"	1127 mm 44.37"	320 mm 2.2"

Table 5-2 Dimensions

5.5 Component Diagram and Logical Links

Please see below for the logical connection (links and interfaces) between the FareGo Val SV|51 components.

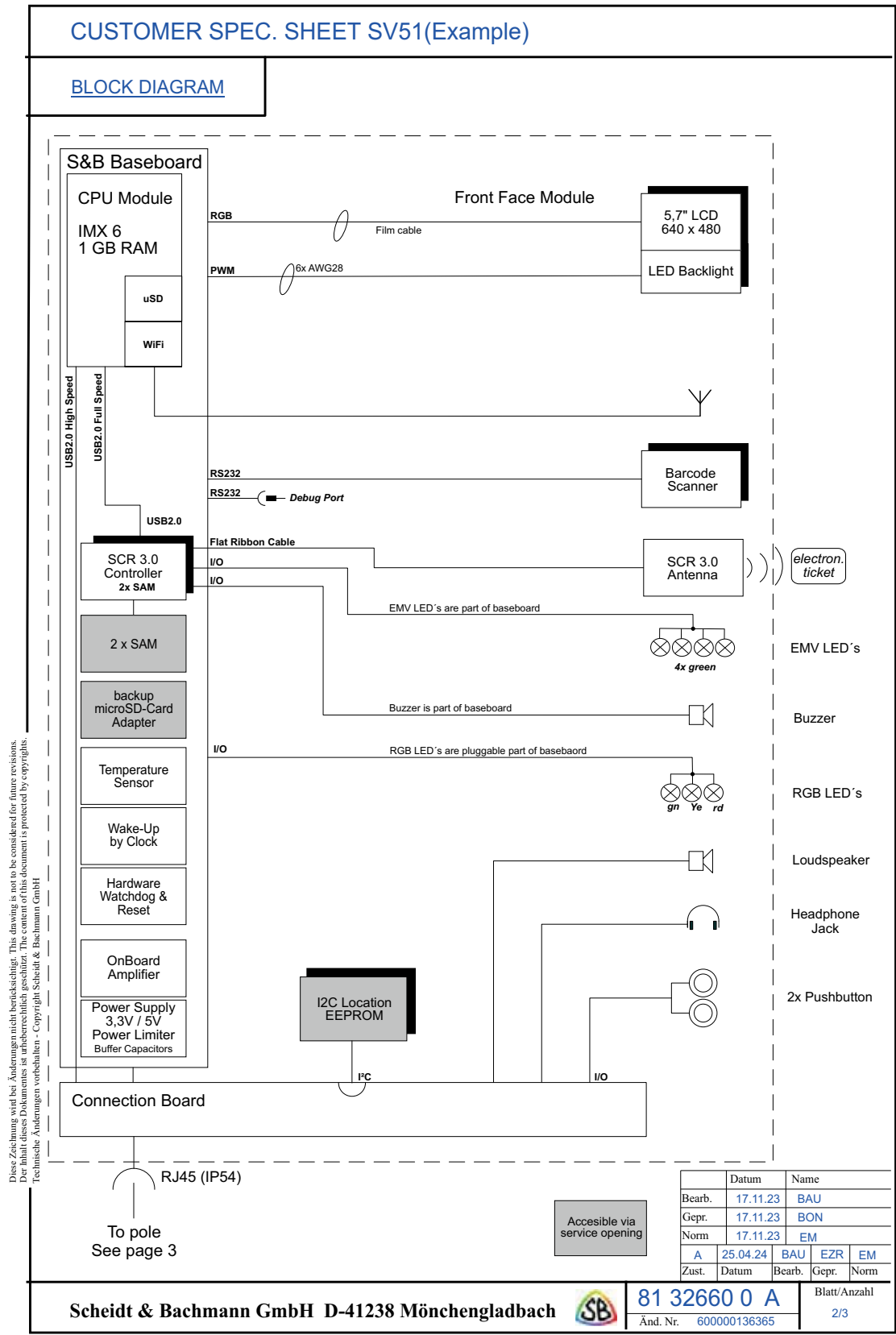


Figure 5-2 Block Diagram Page 1

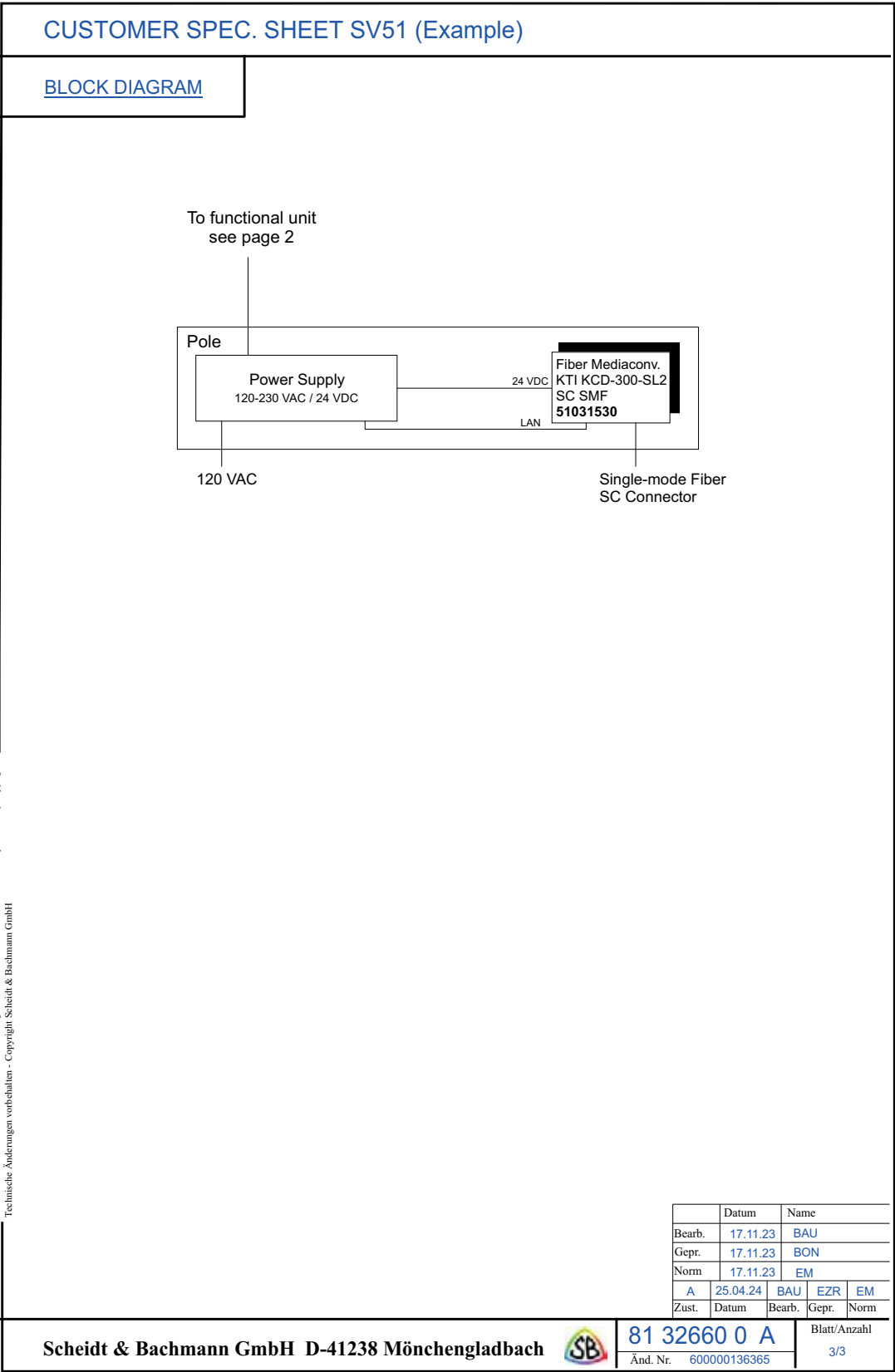
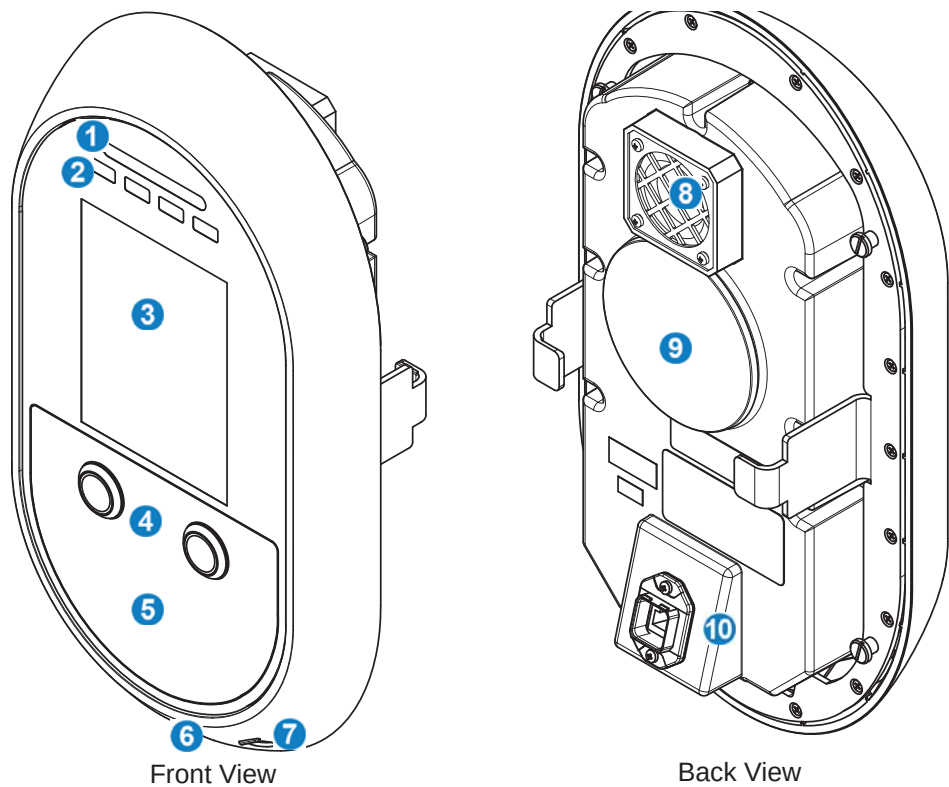


Figure 5-3 Block Diagram Page 2

5.6 Base Unit of the FareGo Val SV|51

Figure 5-4 shows the components of the base unit.



- | | |
|--|---------------------------------|
| ① Status LEDs | ⑥ Barcode Reader (optional) |
| ② EMV Status LEDs | ⑦ Headphone Jack (optional) |
| ③ Patron Display | ⑧ Loudspeaker |
| ④ Pushbuttons | ⑨ Service Cover |
| ⑤ Multi-Application Reader
Antenna, Reading Area (optional) | ⑩ Power and Ethernet Connection |

Figure 5-4 Base Unit - Component Identification

5.6.1 Status LED

The validator is equipped with colored LEDs for the indication of the operational status of the device, as well as the result of the transaction. The colored LEDs are accommodated in the validator housing and illuminate the transparent area in the upper side of the housing for simple visualization of the device and transaction status, see **Figure 5-5**.

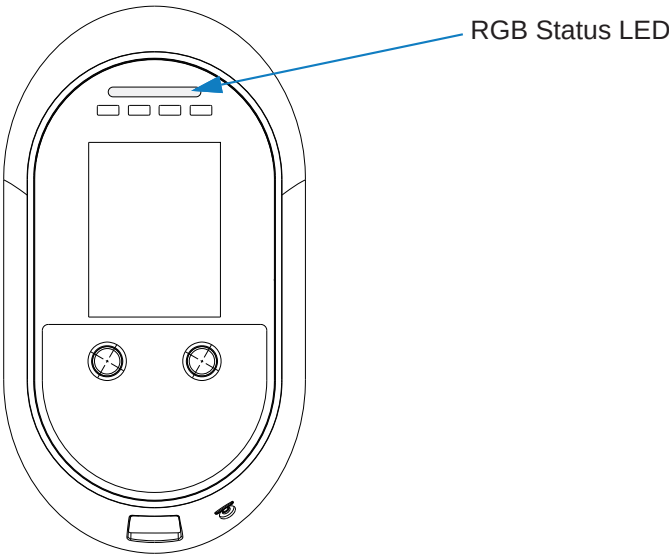


Figure 5-5 Status LED

The LEDs are controlled by the customer specific application, in general the following indications are possible

- Red
- Green
- Yellow

In the following table a sample setup of status and transaction indication is listed:

Functionality	LED Color	Description
Status indication	Green	Device "In Service"
	Red	Device "Out of Service"
Transaction indication	Yellow	• Card blocked • Value not sufficient • Ticket not valid
	Green	Transaction successful
	Red	• Failure • Card not valid • Error occurred

Table 5-3 Status LED Indication

5.6.2 EMV Status LED For EMV processing the validator has four green LEDs to display the status and transaction information for EMV solutions according to EMVCo standard, see .

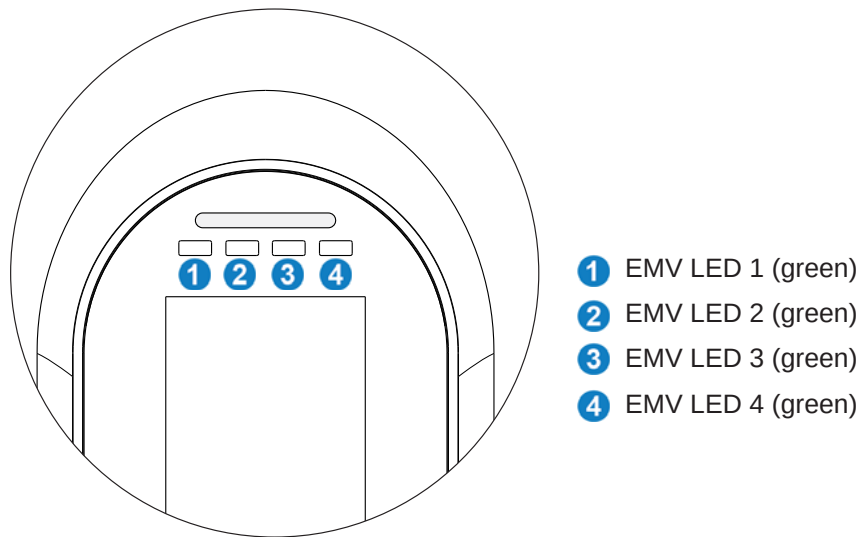


Figure 5-6 EMV LED

These LEDs are:

- EMVCo LED1 is flashing for idle or switched on for card acceptance ready.
- EMVCo LED2 if card is processed
- EMVCo LED3 if card is processed
- EMVCo LED4 if card is processed successfully

Additional indication of EMV LED 1 (since software Version 80063.V (v1.7.1.2))

- An uninitialized reader all flashes at 1 Hz with EMV LED 1 and the yellow LED.
- If a SAMv2 for EMV is available, the EMV-LED1 flashes briefly every 5 seconds (ready for operation but no read enable).
- If an EMV order is present, the EMV LED 1 lights up continuously, all results (Approved/Declined) are displayed as usual.
- If there is a job for another application and the EMV application would also be ready for operation (SAMv2 available), the EMV LED 1 lights up.

If the EMV application is not ready for operation, the EMV LED1 remains off, but closed loop smart cards, can still be processed.

5.6.3 Patron Display

The validator is equipped with a 5.7" VGA TFT color display for patron information. The display has a resolution of 640 x 480 pixels and the following characteristics, see **Table 5-4**.

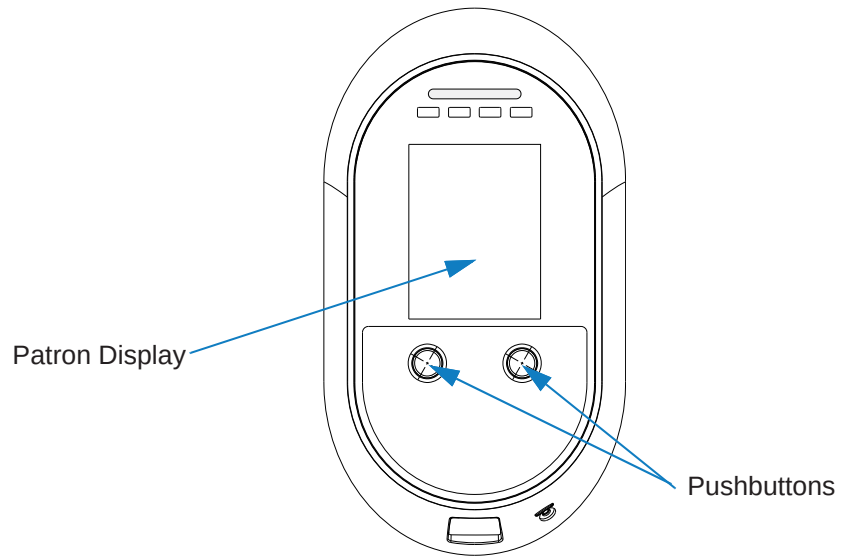


Figure 5-7 Patron Display and Pushbuttons

Display diagonal	5.7"
Ratio	4:3
Resolution	640 x 480 VGA
Colors	262144
Backlight system	LED based
Contrast ratio	200:1 (typ)
Brightness	350 cd/m ²
Viewing angle	Readable minimum 45° in all directions

Table 5-4 Patron Display Technical Data

5.6.4 Pushbuttons

For operation the device is equipped with two pushbuttons below the patron display, see **Figure 5-7**.

5.6.5 Multi-Application Reader 3.0

Scheidt & Bachmann's contactless Multi-Application Reader 3.0 (Smart Card Reader 3.0, SCR 3.0) (**Figure 5-8**) is designed for reading of contactless media with different standards and applications as well as NFC passive initiator mode communications with mobile phones. The Multi-Application Reader 3.0 is a standalone unit, certified for EMV credit cards and used in multiple Scheidt & Bachmann devices. The Multi-Application Reader 3.0 consists of two parts - a circuit board and an antenna. The circuit board of the reader and the system software is fully developed and manufactured in house.

The Multi-Application Reader 3.0 offers maximum contactless media flexibility - it has four ISO 7816 SAM slots. The reader is capable of simultaneously processing multiple Smart Card specifications, with auto-sensing of the appropriate scheme as the card is presented.

The reader's high processing speed delivers fast transaction times by use of a high speed processor and good antenna design. Long component life and innovative design helps ensure a long lifespan.

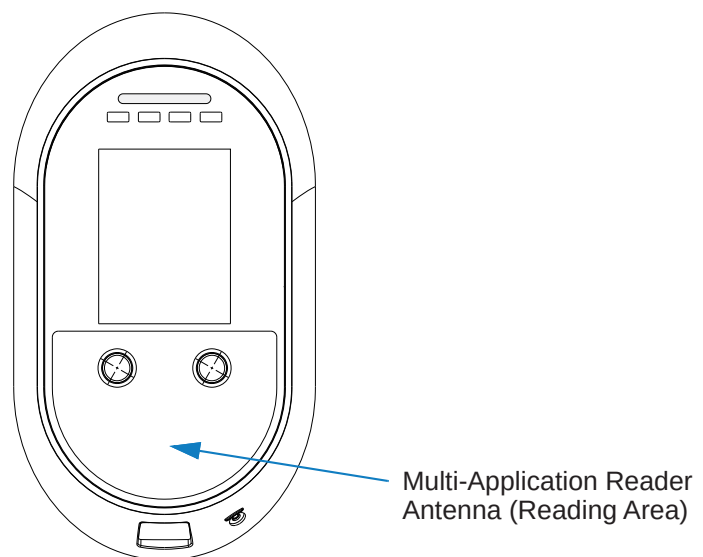


Figure 5-8 Multi-Application Reader 3.0

The specific media that are supported are agreed on a project-specific basis.

5.6.6 Barcode Reader

A 1D/2D barcode reader is installed, providing the ability to capture data from tickets and other documents such as loyalty cards or paper tickets with barcodes for the purposes of fast and simple transactions.

The reader incorporates a CMOS imager which has a wide scan area and is capable of capturing printed barcodes or barcodes on a display of a mobile phone. Successful reads are indicated by an audible tone.

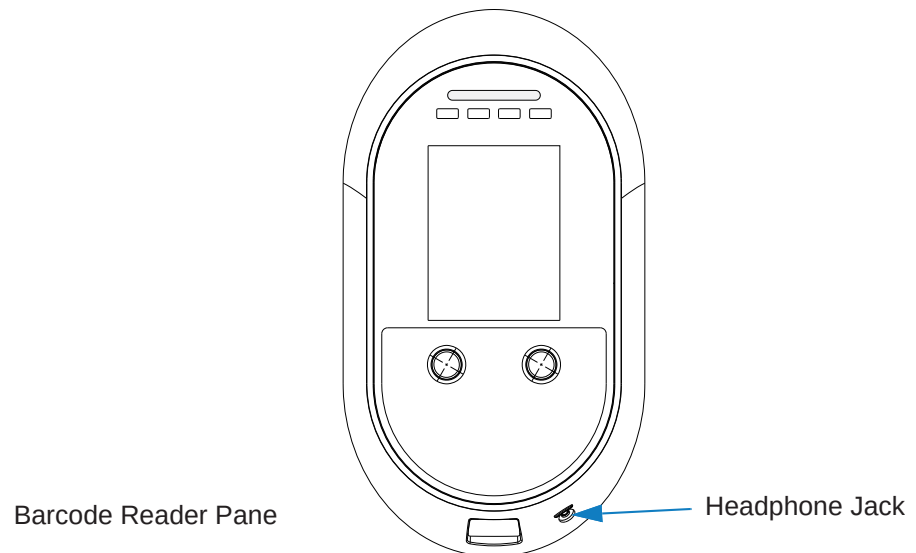


Figure 5-9 Barcode Reader and Headphone Jack

The barcode reader supports the common 1D and 2D codes. Detailed information on the individual codes the barcode reader can read can be found in the corresponding manual, see **Chapter 11**.

The barcode reader is installed behind a transparent pane in the lower part of the housing so that any potential eye damage is prevented as best as possible, see **Figure 5-9**. The aimer is a red LED which lights up the readable area of the scanner.

The barcode focusing range is depending on the barcode used and typically within a distance of 100 mm to 200 mm (3.94" to 7.87") from the reader.

5.6.7 Headphone Jack

To support people with visual impairment or hearing problems, the device is equipped with a miniature 3.5 mm / 0.14" funnel shaped headphone jack, see **Figure 5-9**. The insertion of a headphone plug is detected electronically and can trigger an audio signal provided by the device software.

5.6.8 Computer System

The Scheidt & Bachmann validator PC shown in **Figure 5-10** is designed around an industrial grade high performance motherboard with a Trizeps VII module, and a Linux operating system. Special attention was put on a compact design, without compromising maintainability and reliability.

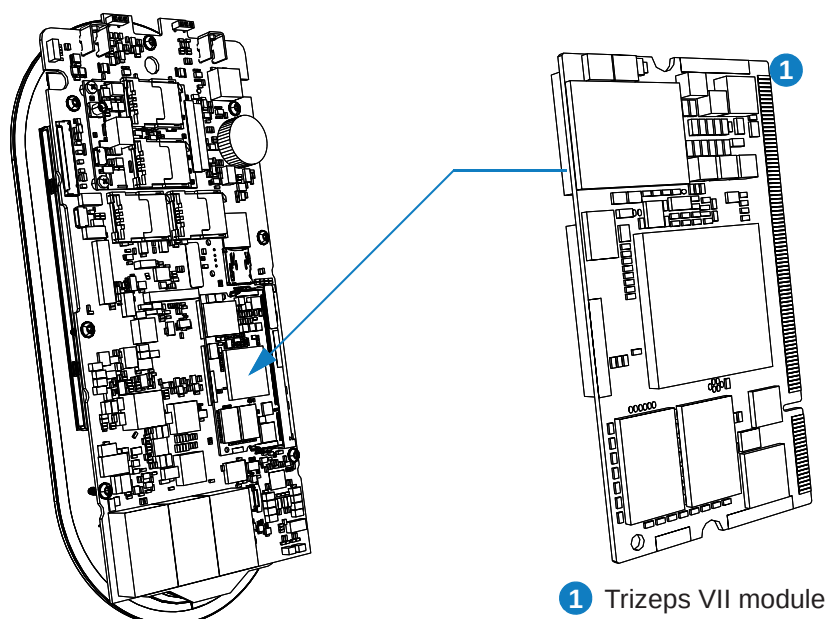


Figure 5-10 Computer System

The computer system has the following specification:

Processor	i.MX 6 ARM Cortex A9 Trizeps VII CPU Module Industrial Version with 800MHz
RAM	1 GB
Memory	• 1 microSD card (System memory) • Optional: 1 microSD Card (Backup Data)]
Operating System	Linux
Watchdog	Hardware Watchdog to reboot the device in case of system failure
Temperature Sensor	Temperature sensor for system shutdown outside of specified temperature ranges
On-board Clock	Real-Time Clock (Capacitor Buffered)
Audio	Audio on Board
Power Supply	Power Supply via Power Switch Box or Power Box or Power Switch Box - All In One
Interfaces	100 Mbit Ethernet Interface
Smart Card Processing Subsystem	• S&B Multi-Application Reader 3.0 • Smart Card Antenna Interface

Table 5-5 Computer System

5.6.8.1 Clock

The computer features a capacitor power buffering electronic clock, which is able to save the time and date settings when the validator is without power. The clock unit maintains the current time and the calendar data for the current year, leap year, month and day without any manual intervention.

5.6.8.2 Software Configuration

The operating system for the processor is Linux. The following software packages will be part of the software system:

- Linux operating system
- Software for the process management
- Software for recording transactional data
- Software for online and offline data transfers
- Software for system self-test procedures

5.6.8.3 Transaction Data Storage

Transactions are stored in two different folders within the device's file system:

- One containing the files that are currently open
- One containing the files that have been closed but not transmitted yet to the transaction server

NOTICE

Already successfully uploaded files will be marked as uploaded and stored in the same folder

Files in the second folder are stored for a period of up to 365 (configurable parameter) days.

The device's file system is managed by the operating system, enabling data access and recovery even in case of application software failure (assuming the main hardware components are still functioning).

5.6.8.4 Backup Memory (optional)

The base unit is equipped with a micro SD card data module for backup-storage of transaction and event data. In case of a validator or base unit replacement, the backup microSD card has to be removed from the old base unit and re-inserted into the new base unit. The stored transaction data can be recovered from the backup microSD card by the new base unit for seamless transaction recording.

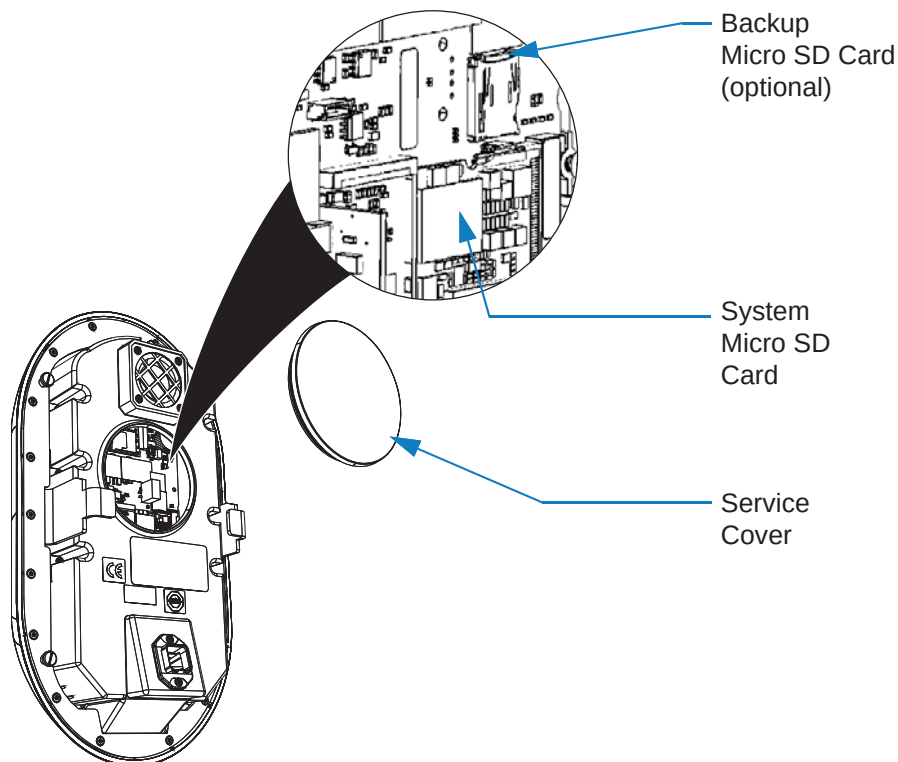


Figure 5-11 Location of Micro SD Cards

5.6.8.5 LAN Interface

The power supply of the validator includes an Ethernet communication interface to perform communication to other components of the fare collection system and the backend.

5.6.8.6 WiFi Connectivity (optional)

WiFi is not activated based on system design.

5.6.9 Lock

A DOM cylinder lock is used to secure the base unit on the column. Once opened, the base unit can be removed without tools.

5.6.10 Power Supply Junction Box

The power supply junction box contains the power supply unit, the electrical connections and fuses and the data connection. For details see **Chapter 3**.

Detailed information on the power supply unit can be found in the corresponding datasheet, see **Chapter 11**.

Chapter 6

Basic Administration Tool (BAT)

The Basic Administration Tool (BAT) offers administrative functions that can be used until the initialization of the device. The customer is guided through menus, which enables simple and intuitive operation.

The following tasks can be carried out with the help of the BAT:

- Test Smarcard reader (optional)
- Display device status
- Test device components
- Make settings
- Version displays
- Perform guided test
- Write external EEPROM
- Initialise
- Update operating system

NOTICE

The BAT is only available for base units that have not yet been initialised. The base unit is therefore in the basic configuration.

NOTICE

To operate the BAT on FareGo Val SV|51 a mouse or a keyboard must be connected via USB to the base unit, see **Section 6.1**. This chapter assumes a mouse to be connected. **Section 6.4** informs about the corresponding keys and shortcuts that can be used with a keyboard.

6.1 Connecting a Mouse or Keyboard via USB

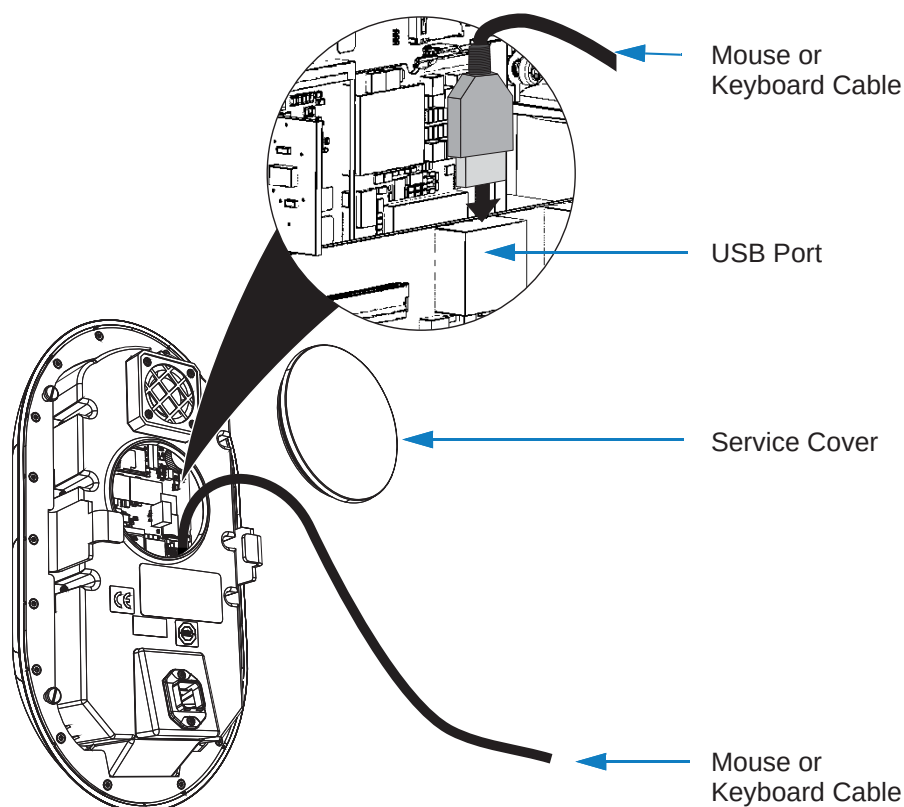


Figure 6-1 Connecting a USB Mouse or Keyboard to the Base Unit

- Step 1** Remove the base unit as described in **Section 9.6.2.1**.
- Step 2** Remove the service cover on the back of the base unit, see **Figure 6-1**.
- Step 3** Disconnect the fan cable from the USB port.
- Step 4** Connect the mouse or keyboard to the USB port.
- Step 5** Reconnect the base unit to the power supply junction box as described in **Section 9.6.2.2**.

After completing the use of the BAT tool:

- Step 6** Disconnect the mouse or keyboard.
- Step 7** Connect the fan cable again to the USB port.
- Step 8** Close the service cover.
- Step 9** Place the base unit in the proper position on the stainless steel column and then press down and slide to connect.
- Step 10** Use the key to lock the device.

6.2 Start service mode

The BAT is started automatically as soon as the not yet initialised base unit is plugged into a workshop pole or SV|51. After initialisation with a customised application, the BAT is no longer available.

When the base unit is started, the following screen is displayed.

In the basic position, smart cards and barcodes can be read.



After reading a barcode or smart card, the result is displayed as an event.

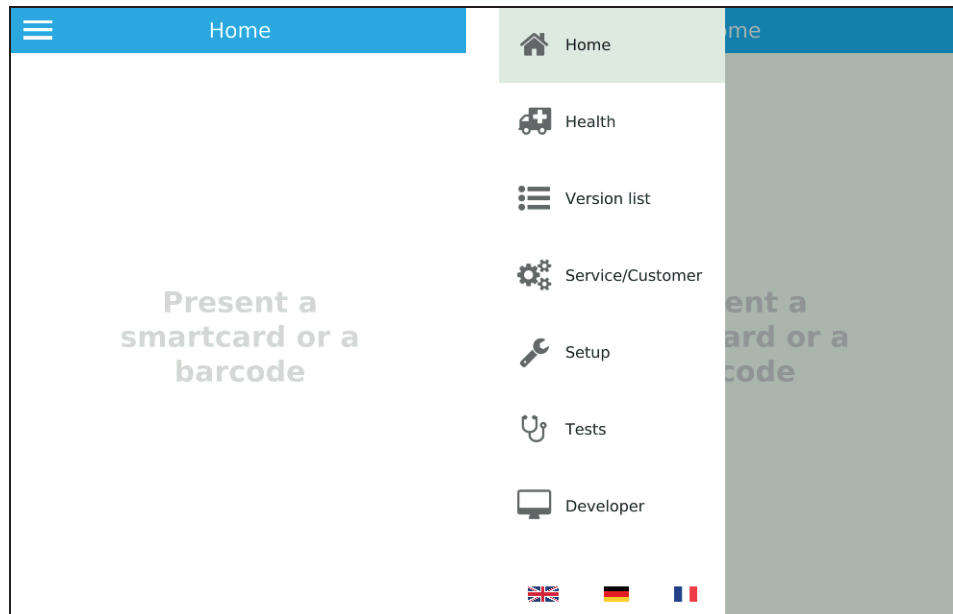
NOTICE

With many screens where the text is longer than the display can show, it is possible to scroll. To do this, move the text with the mouse button pressed.

6.3 User interface

The user interface is divided into different areas. An explanation of the different areas can be found on the following pages.

Clicking on the menu symbol  takes you to the overview of functions.



The areas are:

- Home
- Health
- Version list
- Service/Customer
- Setup
- Tests
- Developer

6.3.1 Home

The Home symbol  takes you back to the home position of the BAT.

6.3.2 Health

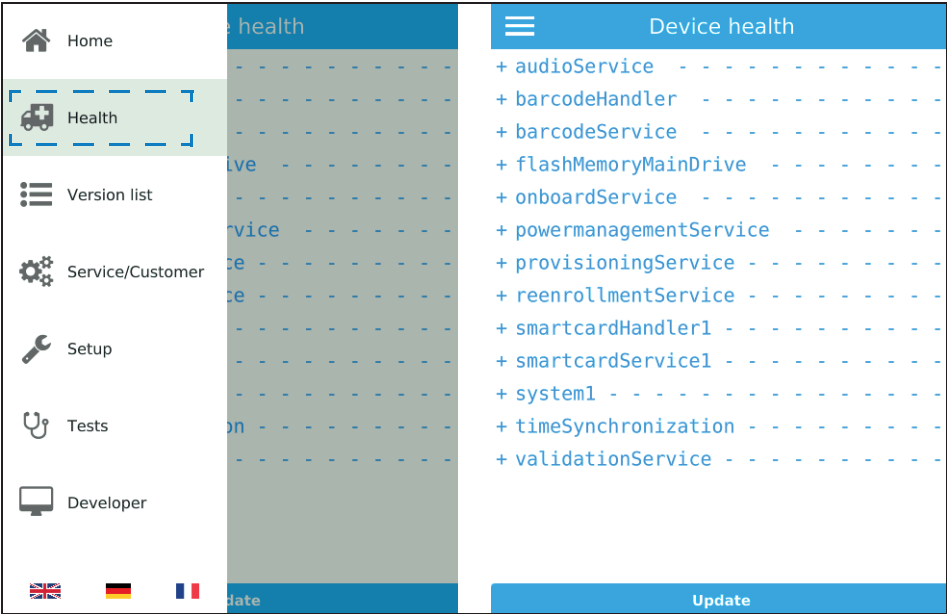
At the menu "Health", the condition of various hardware and software components are shown.

Clicking on the sign  opens the sub-menu with detailed information.

The "Refresh" button reads the unit states again.

All information in this area is important for hardware and software development and is not required by the customer.

Therefore, this point will not be discussed further. For an extended error analysis, it may happen that data from this area is requested by the helpdesk or a developer.



6.3.3 Version list

At the menu “Version list” the current software version of the various components are displayed:

- System
- Smart Card Reader
- Barcode Reader
- Dependencies

Here you can check whether the required software versions are available on the unit.

Home

Health

Version list

Service/Customer

Setup

Tests

Developer



on list

4.0.8-35-80db051

Ubuntu 18.04.6 LTS

.999-184-gc587bb828

n/a

n/a

07337130_d

BI000492EAA

lop/4.1.10-SNAPSHOT

Version list

- System -

Baseimage: 4.0.8-35-80db051

Operating system: Ubuntu 18.04.6 LTS

Yukon SDK: 5.0.999-184-gc587bb828

- Smartcard -

Bootloader: n/a

Configuration: n/a

Firmware: 07337130_d

- Barcode -

Firmware: BI000492EAA

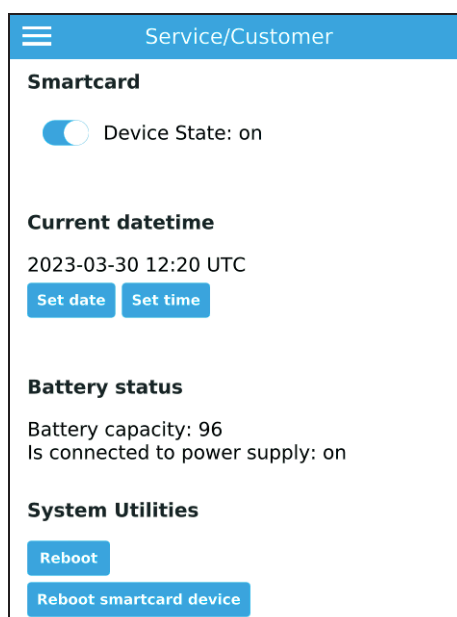
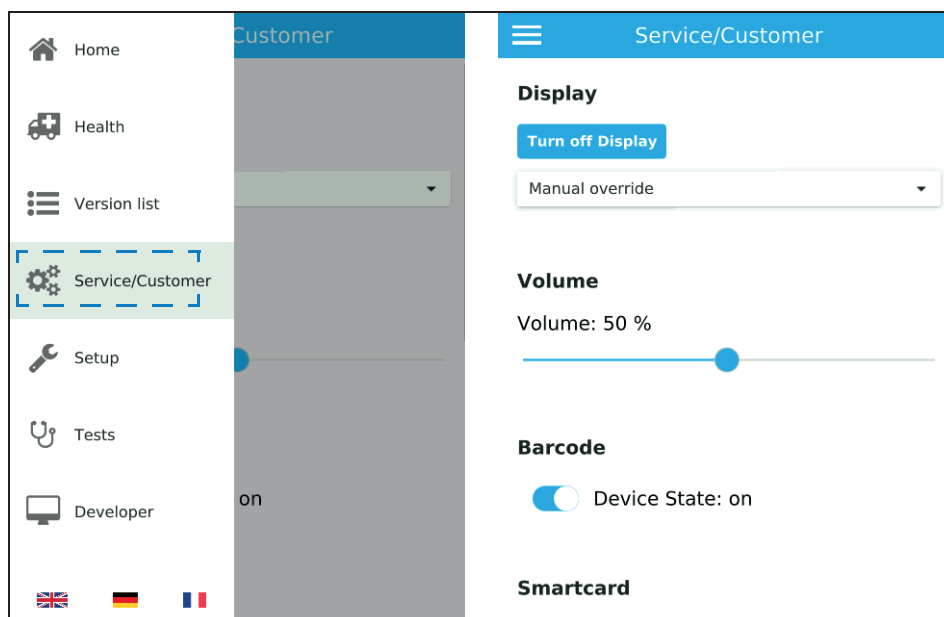
- Dependencies -

fcs_oid_version: develop/4.1.10-SNAPSHOT

6.3.4 Service/ Customer

Under "Service/Customer" you can make settings for the following components:

- Display (see **Chapter 6.3.4.1**)
- Volume (see **Chapter 6.3.4.2**)
- Barcode Reader (see **Chapter 6.3.4.3**)
- Smart Card Reader (see **Chapter 6.3.4.4**)
- Current Date and Time (see **Chapter 6.3.4.5**)
- Battery Status (see **Chapter 6.3.4.6**)
- System Utilities (see **Chapter 6.3.4.1**)

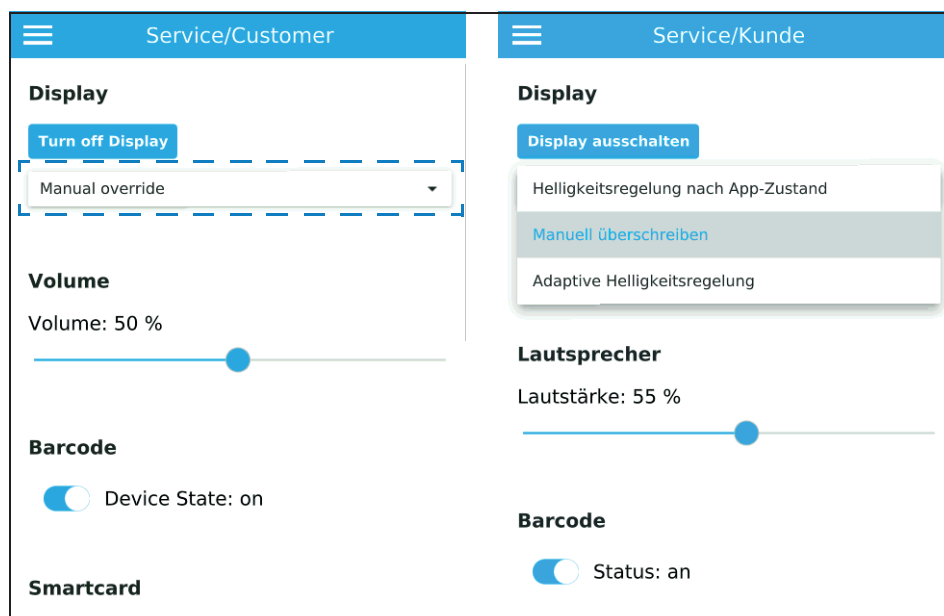


6.3.4.1 Display

Here you can set how the brightness of the display is regulated.

- Brightness control according to app state - (the operating software controls the brightness as required)
- Override manually - (the brightness is adjusted manually via a slider on the screen)
- Adaptive brightness control - (currently not supported)

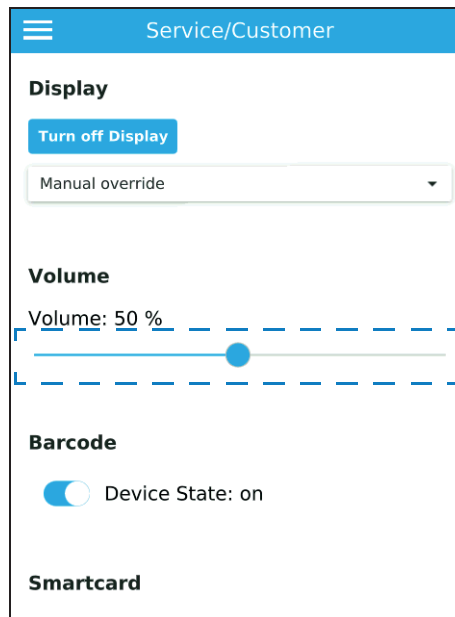
The "Switch off display" button switches the display off for 5 seconds. The display switches itself on again after 5 seconds.



6.3.4.2 Loudspeaker

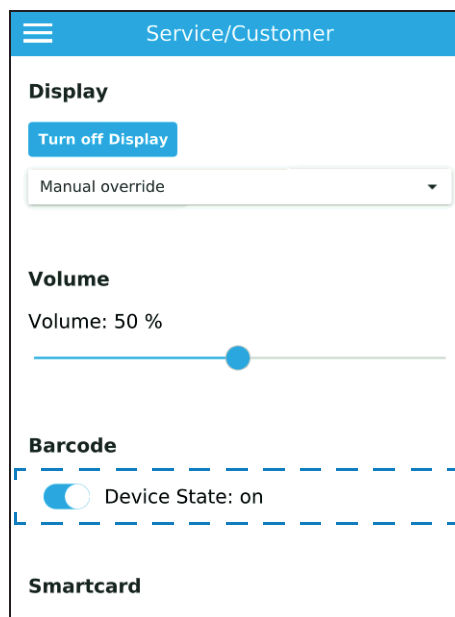
Here you can adjust the volume of the internal loudspeaker via a slider on the screen.

Each time the volume is changed, a test tone is played to check the set volume.



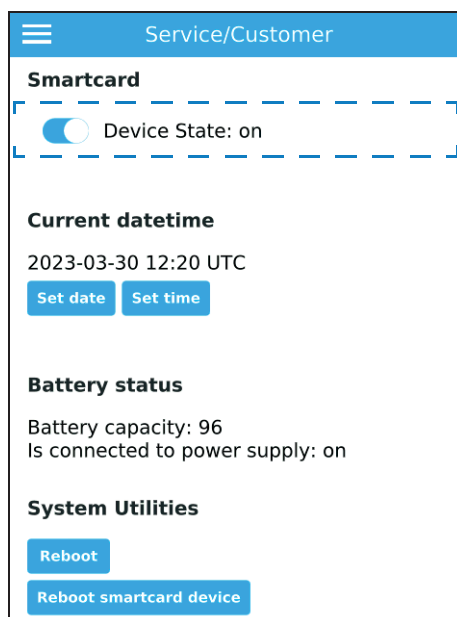
6.3.4.3 Barcode Reader

Each time the volume is changed, a test tone is played to check the set volume.



6.3.4.4 Smart Card Reader

The smart card reader can be switched on and off here.

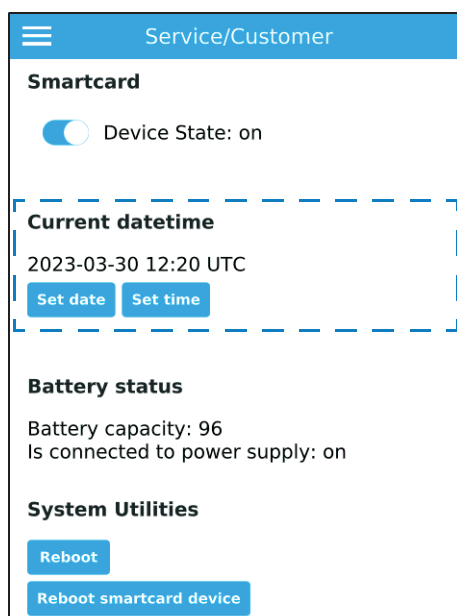


6.3.4.5 Current Time

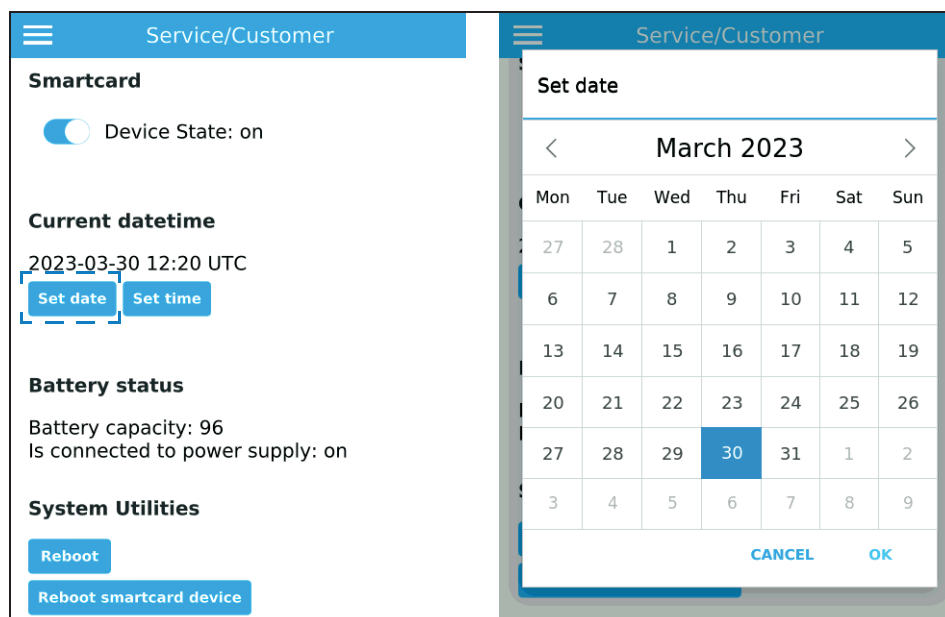
The current date and time are displayed here.

They can be changed with the buttons <Set date> and <Set time>.

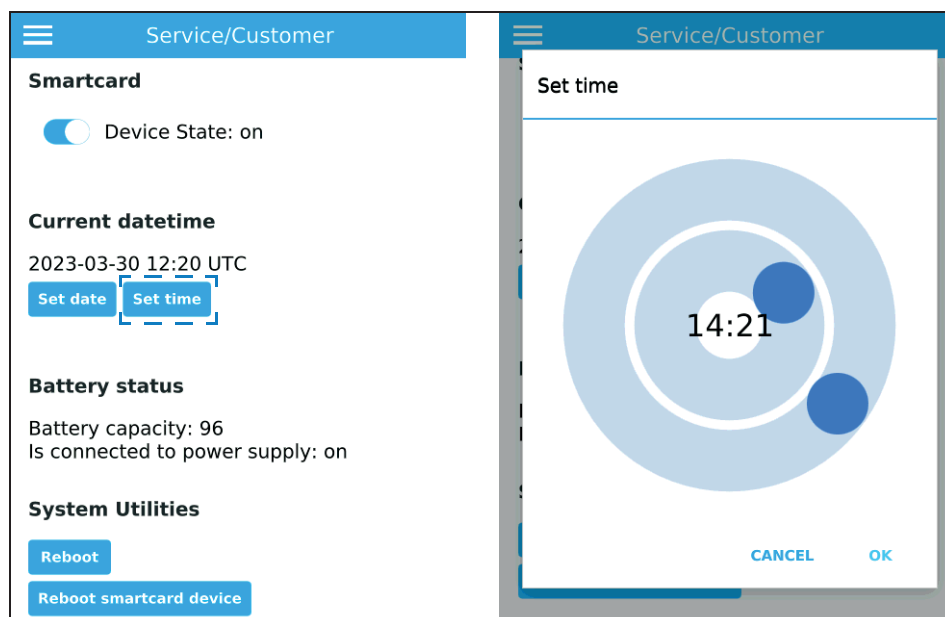
The date and time synchronise automatically when there is a network connection to the server. This overwrites the data that was manually changed here.



To set the date, click the "Set date" button and select the desired date from the calendar view.



To set the time, click the "Set time" button and select the desired time on the schematically displayed clock.



6.3.4.6 Battery Status

This shows the charge status of the battery and the status of the connection to the power supply.

 Service/Customer

Smartcard
 Device State: on

Current datetime
2023-03-30 12:20 UTC
 

Battery status
Battery capacity: 96
Is connected to power supply: on

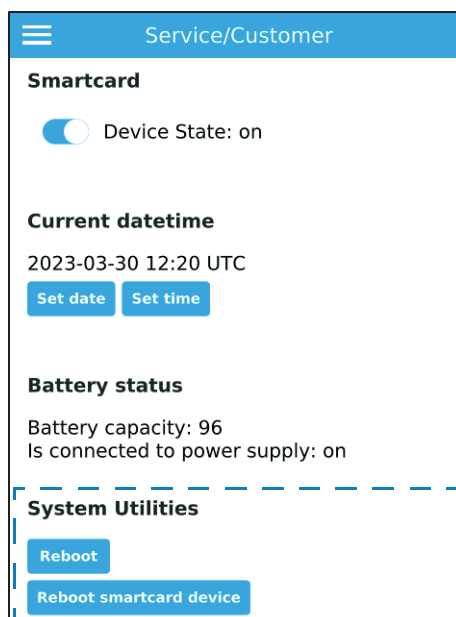
System Utilities



6.3.4.7 System Utilities

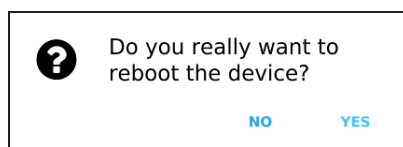
Two reset options are offered here.

- Reboot
- Reboot smart card device



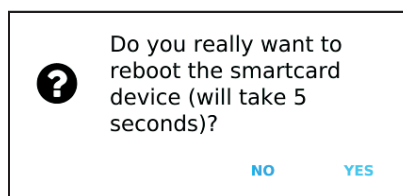
Pressing the "Reboot" button restarts the entire validator.

After pressing the "Reboot" button, the security question must be answered with "Yes" to restart the validator.



By pressing the button "Reboot smartcard device" only the smart card reader is restarted.

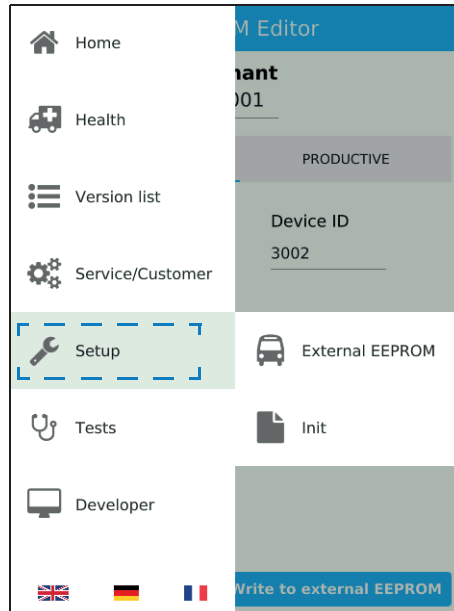
After pressing the "Reboot smartcard device" button, the security question must be answered with "Yes" to restart the smart card reader.



6.3.5 Setup

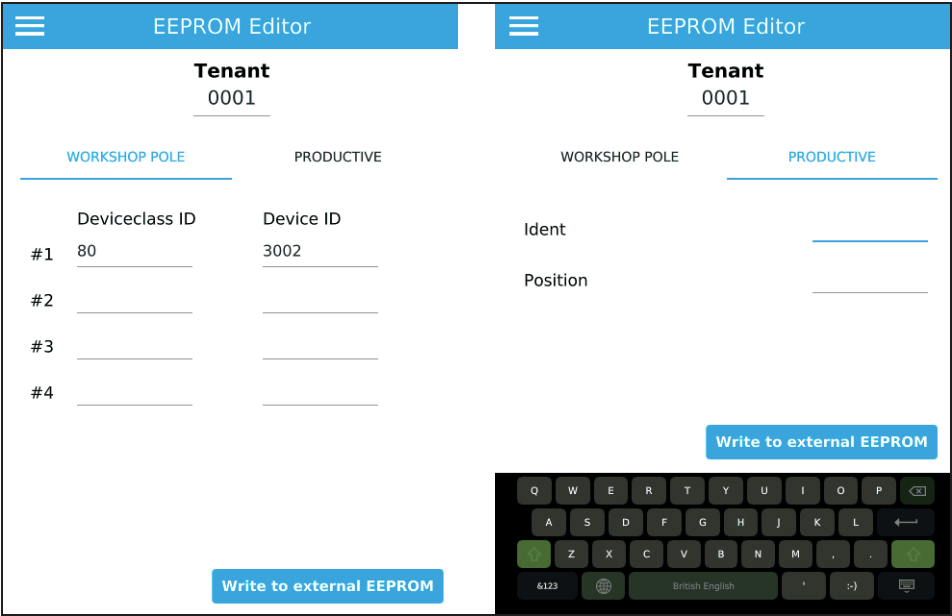
Under the menu item "Configuration" you will find functions for configuring the base unit and the workshop and/or productive pole.

- EEPROM Editor (see **Chapter 6.3.5.1**)
- Init (see **Chapter 6.3.5.2**)



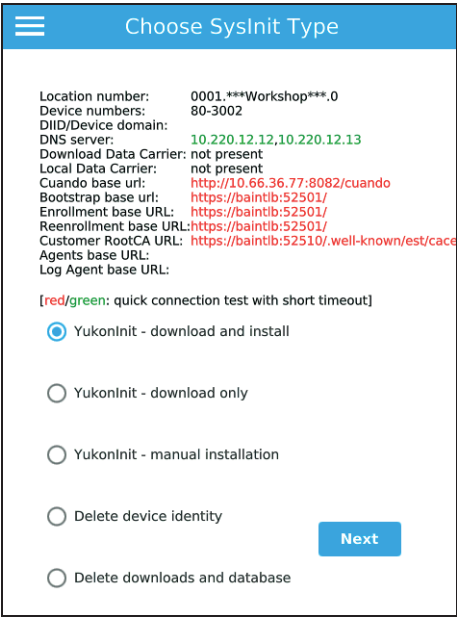
6.3.5.1 EEPROM Editor

This function is described in detail from **Chapter 4.5** Only the start screen of this function is shown here.



6.3.5.2 Init

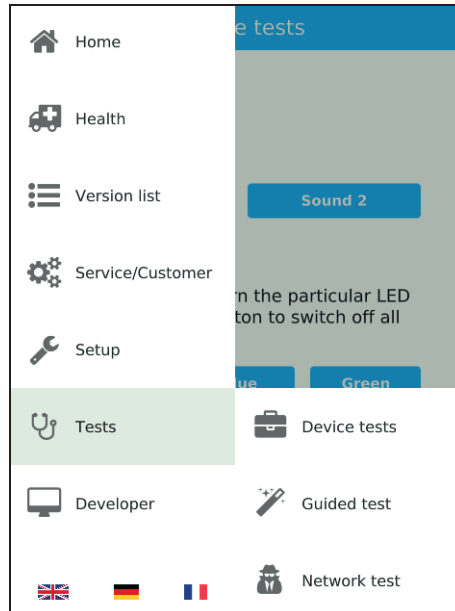
This function is described in detail from **Chapter 4.5** onwards.
Only the start screen of this function is shown here.



6.3.6 Tests

Various software and hardware tests can be carried out in the "Tests" menu.

- Device tests (see **Chapter 6.3.6.1**)
- Guided test (see **Chapter 6.3.6.2**)
- Network test (see **Chapter 6.3.6.3**)



6.3.6.1 Device Tests

Various tests can be carried out in the “Device Tests” menu. The individual tests are self-explanatory or explained by a short text.

The following tests can be performed: ■ **Sound** ■ **LED's** ■ **Test Image**
■ **WLAN band preconfiguration** ■ **Tab simulations** ■ **WLAN-Client**
■ **WLAN-Access Point**.

Device tests

Sound

Plays test sounds.

Sound 1

Sound 2

LED's

Press a button to turn the particular LED on. Press the off button to switch off all LED's.

Red

Blue

Green

All Off

Test Image

Show chosen test image until the screen is touched. The image needs to be .png or .jpg and placed in file:///home/sbuser/

Show

WiFi band preconfigurations

Select one of the WiFi preconfigurations

uaputl.base.conf

Apply WiFi conf and reboot

Tap simulations

Simulates a tap signal from BarcodeHandler/SmartcardService

Tap Barcode ('barcode_id'=4711)

Tap smartcard ('uid'=4711)

Wifi Client

Device State: on

For testing provide an access point with SSID='wifi_ssid' and PSK='secret123' before switching on

SSID WiFi client:

IP address wlan0:

MAC address wlan0:

Device State: off

Network WiFi Access Point

SSID accesspoint: ERR:MRVLPRIVCMD is not su
ERR:Command sending failed!

IP address uap0:

MAC address wlan0:

6.3.6.2 Guided Tests

The guided test can be started via the start button or via the test barcode.

Step 1

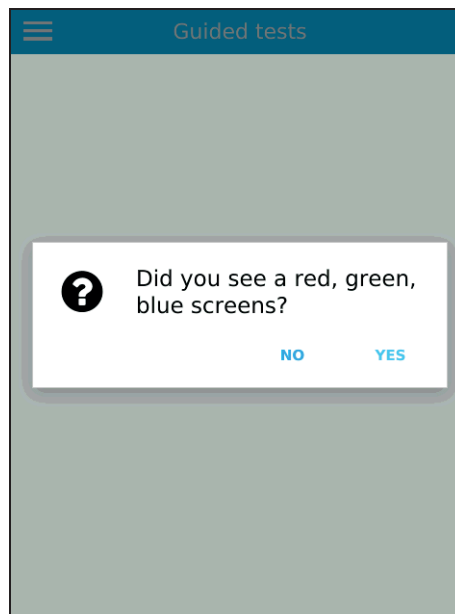
Click the start button to begin the guided test.

NOTICE

Once the guided test has started, it cannot be interrupted. The test takes about 1 to 3 minutes.

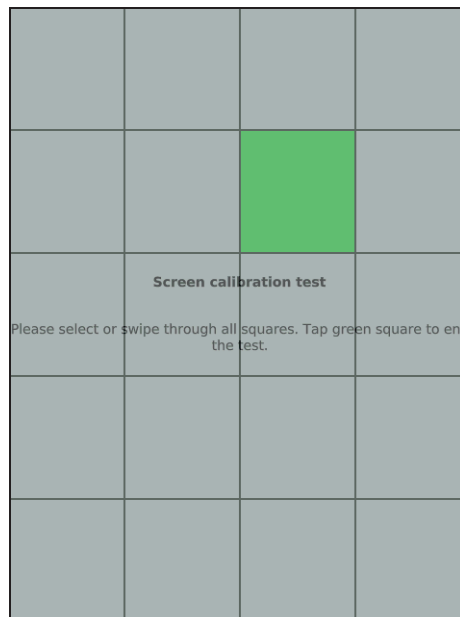


After the start, a red, a green and a blue screen appear one after the other. When you have seen these, confirm this with the "Yes" button.

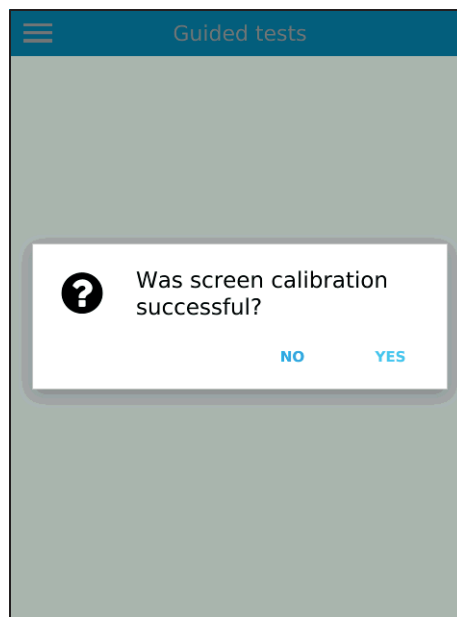


Step 2 Carry out the screen calibration test.

To do this, click on each gray square on the screen. The color changes from gray to green.



When all squares are green and the touch screen has responded satisfactorily, confirm this with the "Yes" button.

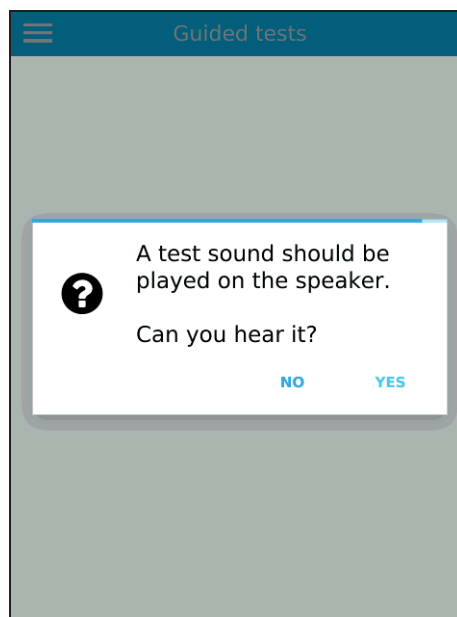


- Step 3** Next, a barcode reader test is carried out.
To do this, hold any barcode in front of the barcode reader.

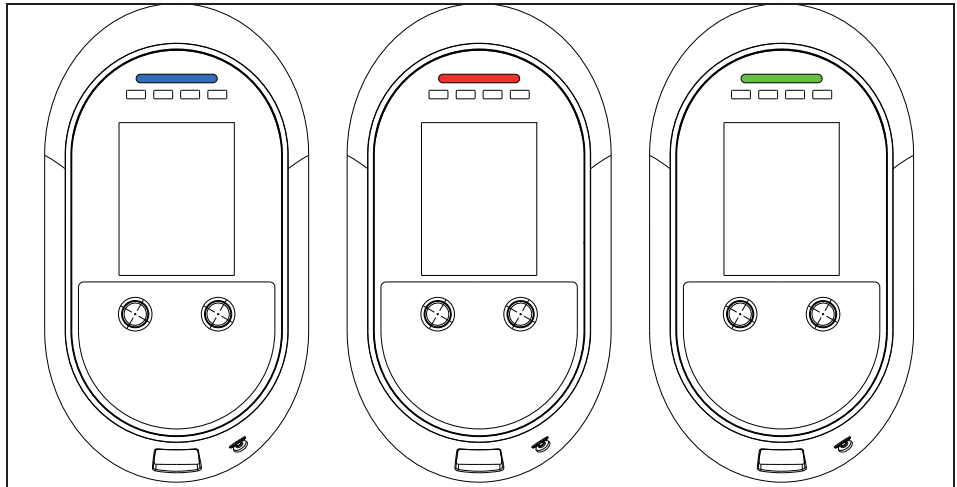
**NOTICE**

A blue bar above the displayed instruction shows how much time is left for this test before it is skipped.

- Step 4** The loudspeaker plays a signal tone. If this was heard, confirm this with the "Yes" button.



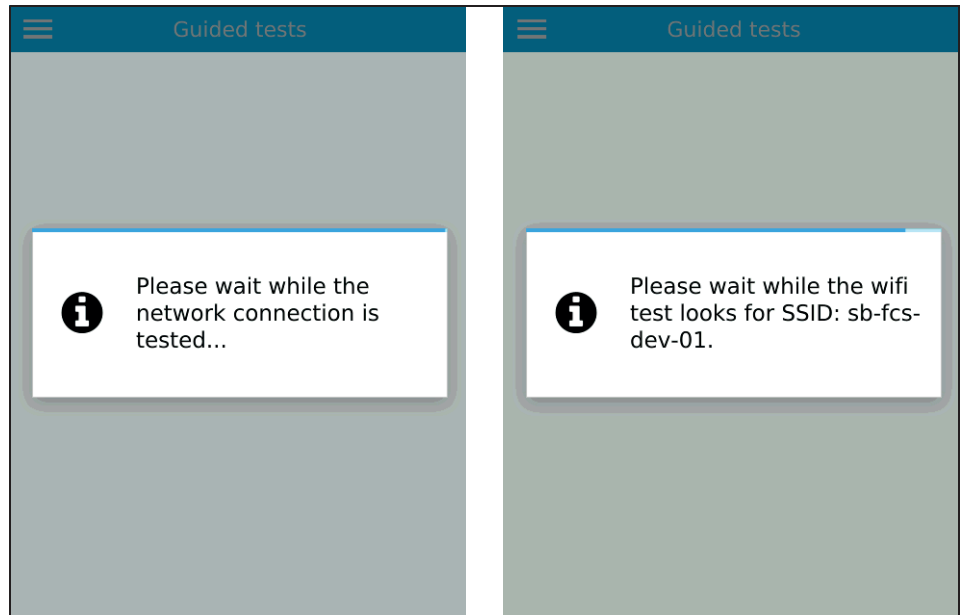
- Step 5** In the following test, the upper LEDs on the base unit are tested.
The blue LED, the red LED and the green LED are switched on one after the other.



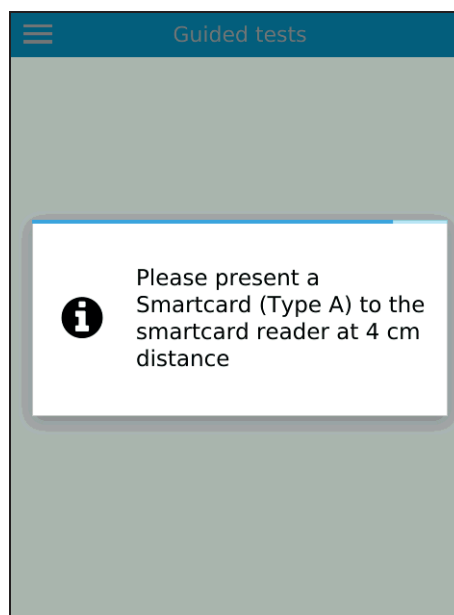
Confirm each individual color with the "Yes" button when it is visible.



- Step 6** Now the network connection is tested automatically. As a user, you have no influence on this test.



Step 7 Next, please have one type A smart card and one type B smart card ready and hold them at the indicated distance in front of the smart card reader when prompted.



Step 8 In the next test, an attempt is made to read SAM places 1 to 4. These reading attempts are carried out automatically.



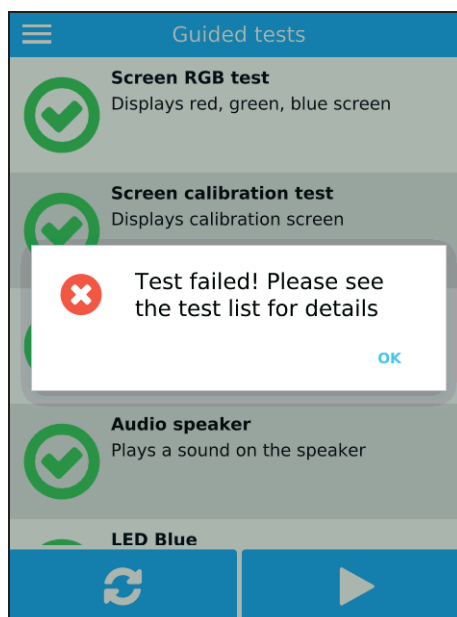
The next tests are carried out automatically and cannot be influenced by the operator.

The next tests are:

- Step 9** Write and read the **Mainboard-EEPROMS**.
- Step 10** Write and read the **Pole-EEPROMS**.
- Step 11** Check the **primary drive**.

At the end of all tests, a listing of the individual test results is displayed.

If any of the tests have not been completed properly, an error message will be displayed.



The list of results can be scrolled through with your finger.



6.3.6.3 Network Tests

The following functions are available in the "Network Tests" area:

1. FareGo Data - Connection test (see Point 1.)
2. Command line commands for the network test (see Point 2.)



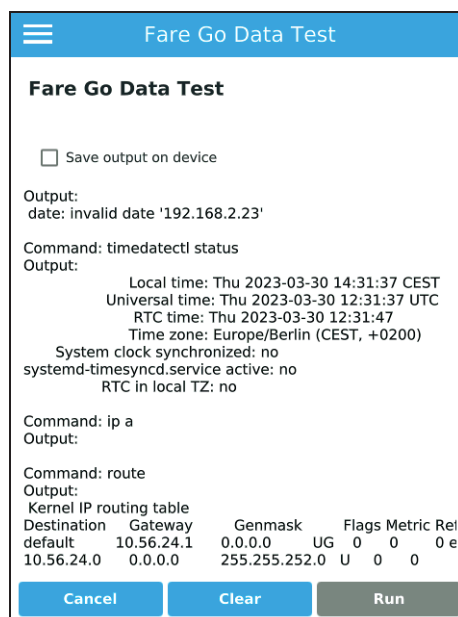
The screenshot shows the "Network Test" interface. At the top, there is a blue header with a menu icon and the title "Network Test". Below the header, the section "Do the test using the command line" is displayed. It includes a prompt "Select a command from the drop-down list" and a button labeled "FareGoData". A dropdown menu is open, showing "ping". Below the dropdown, the text "-c1 1.1.1.1" is visible. At the bottom, there are three buttons: "Run", "Clear", and "Send file". A checkbox labeled "Save output on device" is also present.

1. Test FareGo Data connection:

Step 1 Click the <FareGo Data> button.

Step 2 If the output is to be saved on the device, activate the option "Save output on device" and enter a file name for saving.

Step 3 Start the test with the <Run> button.



The screenshot shows the "Fare Go Data Test" interface. At the top, there is a blue header with a menu icon and the title "Fare Go Data Test". Below the header, the section "Fare Go Data Test" is displayed. It includes a checkbox labeled "Save output on device". The output area shows the following text:

```
Output:
date: invalid date '192.168.2.23'

Command: timedatectl status
Output:
    Local time: Thu 2023-03-30 14:31:37 CEST
    Universal time: Thu 2023-03-30 12:31:37 UTC
    RTC time: Thu 2023-03-30 12:31:47
    Time zone: Europe/Berlin (CEST, +0200)
    System clock synchronized: no
    systemd-timesyncd.service active: no
    RTC in local TZ: no

Command: ip a
Output:

Command: route
Output:
Kernel IP routing table
Destination Gateway Genmask Flags Metric Rel
default 10.56.24.1 0.0.0.0 UG 0 0 0 e
10.56.24.0 0.0.0.0 255.255.252.0 U 0 0 0
```

At the bottom, there are three buttons: "Cancel", "Clear", and "Run".

The test runs automatically and is logged on the screen. Error messages may appear in red letters.

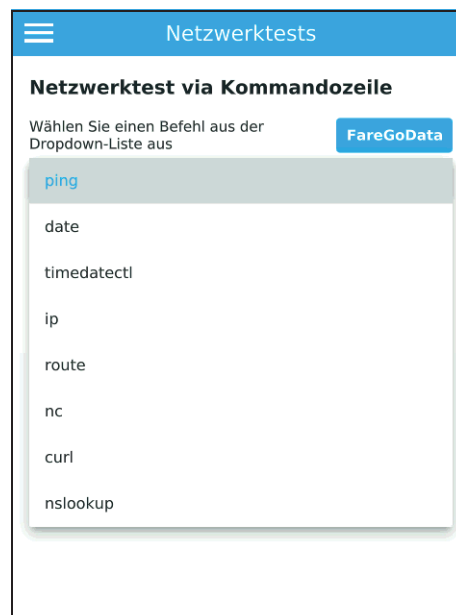
With <Cancel> you can end a running test prematurely. With <Clear> remove the test protocol from the display.

2. Execute command line commands:

The following commands are available:

- ping (Check a network connection via IP-Address)
- date (Change the system date)
- timedatectl (Control the date, time and timezone)
- ip
- route (Change the network routing table)
- nc
- curl (Get or send data using URL syntax)
- nslookup (Finding IP addresses/domains of a specific computer using DNS)

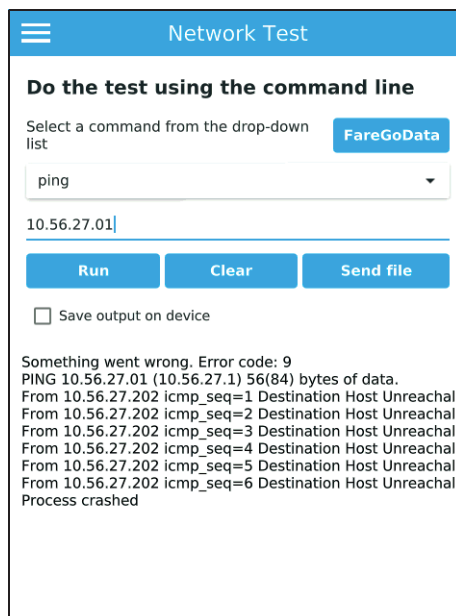
Step 1 Select the desired command from the drop-down list.



Step 2 Enter the associated parameters in the line below the selection field. When you click the line, the screen displays a keyboard for input.

Step 3 If the output is to be saved on the device, activate the option "Save output on device" and enter a file name for saving.

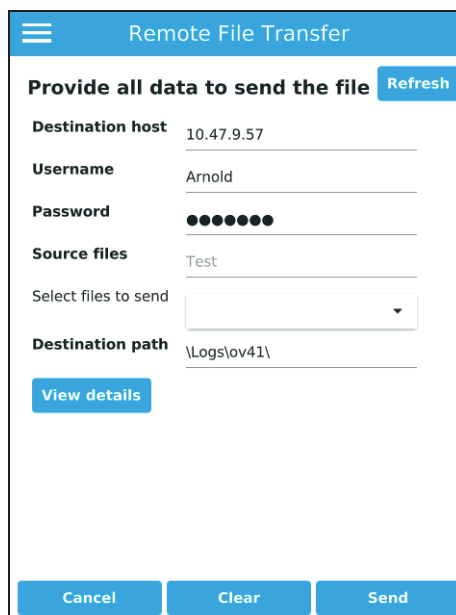
Step 4 Click <Execute>.



With <Stop> you can cancel the execution if necessary, with <Clear> you can remove the data output from the screen.

3. Send files to a destination host:

Step 1 Click the <Send file> button.



Step 2 Enter the destination host and access data.

Step 3 Select the files to be sent from the drop-down list.

Step 4 Indicate the storage path under "Destination path".

Step 5 Use the "View details" button to show detailed information about the data output. Close the info window with "OK".

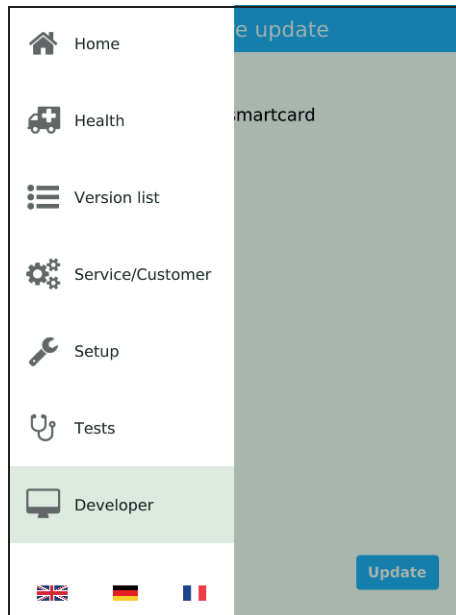
Step 6 Click the <Send> button.

With <Clear> you can delete all entries in the window if necessary, with <Cancel> cancel the function.

6.3.7 Developer

The following functions are available in the "Developer" area:

- SCR Update (see **Chapter 6.3.7.1**)
- Settings (see **Chapter 6.3.7.2**)

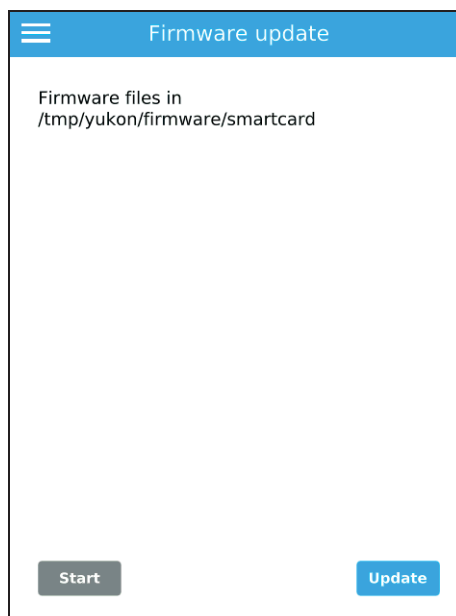


6.3.7.1 SCR Update

This function updates the firmware of the smart card reader.

Step 1

Click the <SCR Update> button in the "Developer" area.

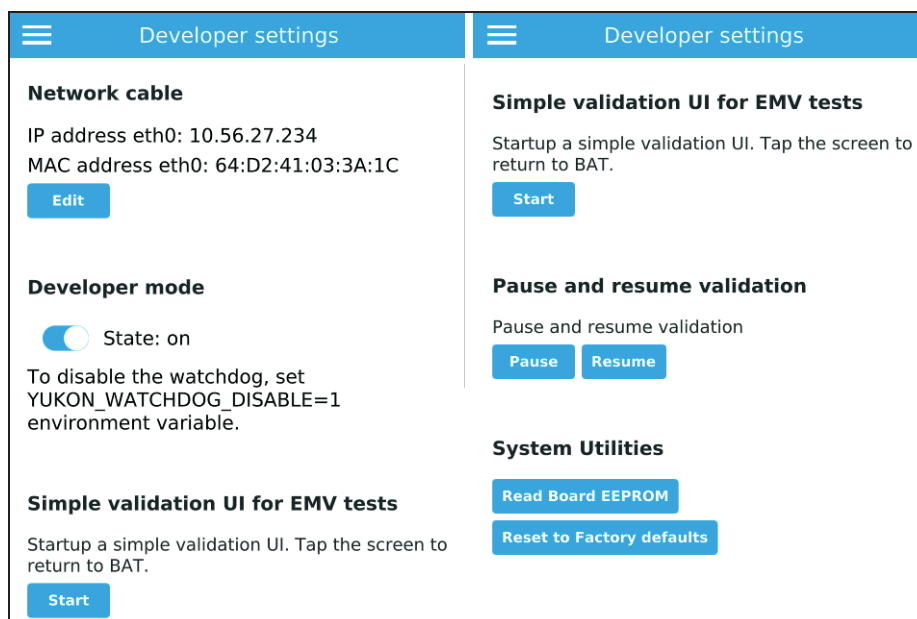


Step 2 Start the update with the <Update> button.

6.3.7.2 Developer Settings

Under “Developer settings” you can make the following developer settings:

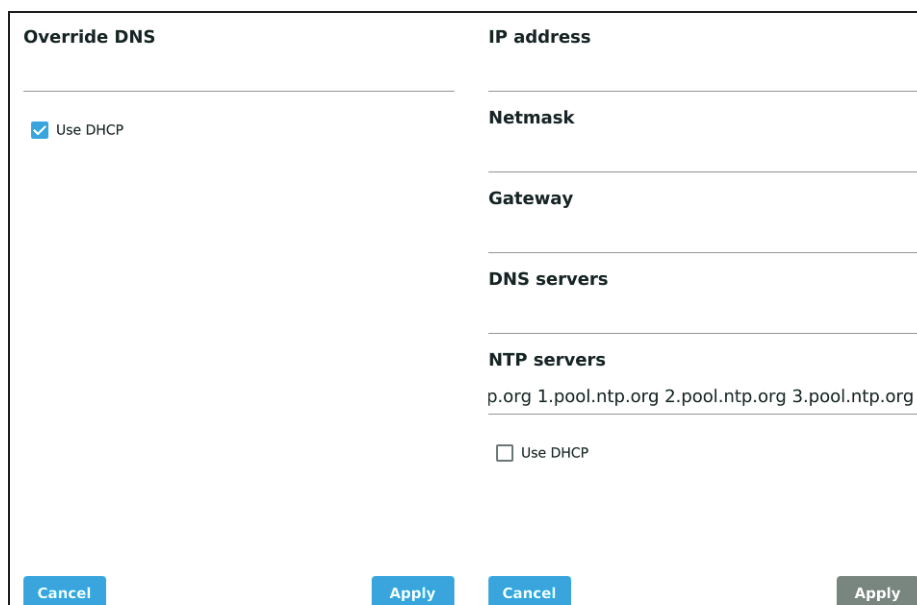
1. View and edit network information (see Point 1.)
2. Switch developer mode on or off (see Point 2.)
3. Validation UI for EMC tests (see Point 3.)
4. Pause and continue validation (see Point 4.)
5. Read out the EEPROM of the unit (System Utilises) (see Point 5.)
6. Reset to Factory defaults (System Utilises) (see Point 6.)



Developer settings	
Network cable IP address eth0: 10.56.27.234 MAC address eth0: 64:D2:41:03:3A:1C <button>Edit</button>	Simple validation UI for EMV tests Startup a simple validation UI. Tap the screen to return to BAT. <button>Start</button>
Developer mode ☒ State: on To disable the watchdog, set YUKON_WATCHDOG_DISABLE=1 environment variable.	Pause and resume validation Pause and resume validation <button>Pause</button> <button>Resume</button>
Simple validation UI for EMV tests Startup a simple validation UI. Tap the screen to return to BAT. <button>Start</button>	System Utilities <button>Read Board EEPROM</button> <button>Reset to Factory defaults</button>

1. Network information

In this area you can see the IP address and the MAC address of the Ethernet interface. You can make changes via the <Edit> button.



Override DNS	IP address
☒ Use DHCP	
	Netmask
	Gateway
	DNS servers
	NTP servers p.org 1.pool.ntp.org 2.pool.ntp.org 3.pool.ntp.org
	☐ Use DHCP
<button>Cancel</button>	<button>Apply</button> <button>Cancel</button> <button>Apply</button>

In the default setting, "Use DHCP" is activated. If deactivated, the following network information can be recorded manually:

- IP Adresse
- Netmask
- Gateway
- DNS server
- NTP server

2. Switch developer mode on or off

Developer mode allows SSH access to the unit.

NOTICE

Before initialisation, the developer mode must be switched on.

You can switch the developer mode on or off in the developer settings. Before switching over, a confirmation prompt is displayed.

NOTICE

To the Watchdog to deactivate must the environment variable YUKON_WATCHDOG_DISABLE=1 must be set.

3. Validation UI for EMC tests

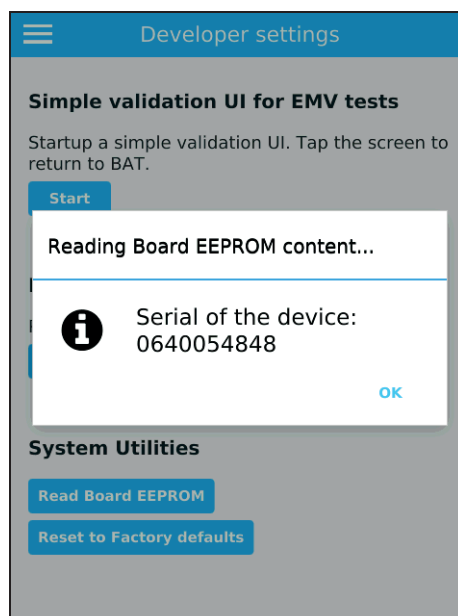
Use the <Start> button to open a simple validation environment for EMC tests. The screen shows the detection of EMV cards in color. To return to the BAT, tap the screen.

4. Pause and resume validation

With the <Pause> button you switch the barcode reader and the smart card reader inactive so that the validation pauses. With <Resume> you switch the barcode reader and smart card reader active again.

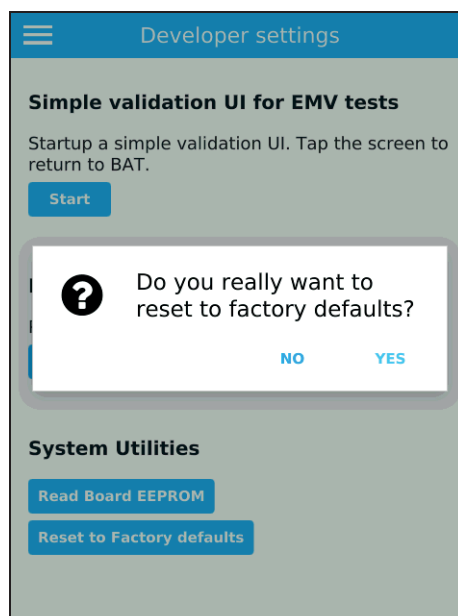
5. Read out the EEPROM of the unit

Use the <read out the unit's EEPROM> button to display the serial number stored on the EEPROM.



6. Restore factory settings

Use the <Restore factory settings> button to reset the unit to factory settings. Before resetting, a confirmation prompt is displayed.



6.4 Keyboard Operation of the BAT Tool

6.4.1 Shortcuts

Use the following shortcuts if you are operating the BAT tool with a keyboard:

Shortcut	Explanation
CTRL + M	Open the Menu
CTRL + H	Open the Home View
CTRL + R	Open the Firmware Update View
CTRL + Shift + H	Open the Device Health View
CTRL + T	Open the Device Test View
CTRL + S	Open the Settings View
CTRL + V	Open the Version View
CTRL + G	Open the Guided Test View
CTRL + E	Open the EEPROM Programmer View
CTRL + I	Open the Sysinit View
CTRL + U	Open the OS Update View

Table 6-1 Keyboard Shortcuts for Operating the BAT Tool

6.4.2 Navigation in the Menu

Use the following keys inside the Menu:

Key	Explanation
Up/Down Arrows	Move between menu icons
Tab/Backtab	Move between menu icons
Space/Enter	Confirm your choice

Table 6-2 Navigation in the Menu

6.4.3 Navigation in View

Use the following keys inside specific views:

Key	Explanation
Tab	Go to the next element (or from last to first)
Backtab	Go to the previous element (or from first to last)
Space/Enter	Confirm your choice
Left/Right Arrow	Change the state of a switch
Left/Right Arrow	Decrease or increase a slider value
Up/Down Arrow	Change the value of a combobox

Table 6-3 Navigation in Views

6.4.4 Scrolling in View

Use the following keys to scroll in views:

Key	Explanation
Up/Down Arrows	Scroll in view

Table 6-4 Scrolling in Views

NOTICE

The scroll automatically adjusts to the active focus. This means that if you select another element in the view, the displayed area is adjusted without manual scrolling.

6.4.5 Use of Keys in Popup Window

Use the following keys inside popup windows:

Key	Explanation
O	Select the <OK> button
C	Select the <CANCEL> button
Y	Select the <YES> button
N	Select the <NO> button

Table 6-5 Key Selection in Popup Windows

6.4.6 Use of Keys in Date Settings

Use the following keys to set the date:

Key / Shortcut	Explanation
Left Arrow	Change to previous day
Right Arrow	Change to next day
CTRL + Left Arrow	Change to previous month
CTRL + Right Arrow	Change to next month

Table 6-6 Scrolling in Views

6.4.7 Use of Keys in Time Settings

Use the following keys to set the time:

Key / Shortcut	Explanation
Left Arrow	Decrease the minutes by one
Right Arrow	Increase the minutes by one
Up Arrow	Increase the hours by one
Down Arrow	Decrease the hours by one

Table 6-7 Scrolling in Views

Chapter 7 Revenue Services

- 7.1** This chapter is not required for this device type

Chapter 8 Preventive Maintenance

8.1 General Maintenance and Cleaning

The following general preventive maintenance schedules and cross references are for the overall maintenance and cleaning of the FareGo Val SV|51. The schedules should be followed by the customer. Cross references direct the customer to the procedures for specific items, including testing and validating the equipment to ensure proper operation.

NOTICE

Maintenance on validator equipment subject to outdoor environmental conditions should be performed **ONLY** if the following conditions are met:

- Temperature of the validator does not fall below -30 °C (-22 °F).
- Humidity must be between 5 % and 95 %, non-condensing.
- Rain and snow ingress during maintenance must be prevented.

These restrictions are necessary because exposure to severe environmental conditions such as cold temperatures, rain, snow, and wind, can cause serious and permanent damage to the equipment. PCBs (Printed Circuit Board) may malfunction and cease operation at temperatures below -30 °C (-22 °F). Exposure to rain or snow may lead to short circuits and resulting equipment damage.

NOTICE

Failure to follow these guidelines can lead to damages that will not be covered under the warranty.

NOTICE

From a technical point of view, no Preventive Maintenance activities are needed for the Validators to ensure their functionality and availability.

S&B recommends that the customer inspects the Validators visually at regular intervals in order to detect defects and vandalism damages as soon as possible. This inspection should also focus on optical disturbance factors that limit the device functionality, e.g. graffiti on the Patron Display.

For the best possible user experience, S&B recommends to clean the devices in regular intervals. These intervals depend on the operating environment of the Validators and may need to be adapted if the devices are subject to heavy use or extreme environmental conditions, such as air pollution, dust, or other environmental factors, such as a construction work or high traffic density. For more details on the cleaning procedure, please refer to the corresponding S&B Service Manual of the Validator.

NOTICE

S&B Smart Card Reader - Safety instruction

With every service activity it needs to be checked:

- ✓ The validator housing does not have signs of tampering, opening by force, physical damage etc.
- ✓ The validator identification (serial number) is correct and matches company records. In other words it needs to be checked if the validator number XXXXXXXX is supposed to be installed in bus number YYYYYYYY.
- ✓ There are no unauthorized devices connected to the validator, especially around the landing plane of S&B Smart Card Reader antenna. Please note that such devices can be well hidden, so their presence might only be indicated by i.e. increased thickness of some parts.
- ✓ There are no extra wires or devices soldered or connected to the S&B Smart Card Reader.

Annually it needs to be checked:

- ✓ The S&B Smart Card Reader identification (serial number) is correct and matches company records – is the S&B Smart Card Reader number ZZZZZZZZ supposed to be installed in validator number XXXXXXXX.
- ✓ The SAM card identification (serial number) is correct and matches company records – is the SAM reader number AAAAAAAA supposed to be installed in reader number ZZZZZZZZ?

For more information see “SBSCR2_SecurityGuidance_LifeCycle” document. Regarding security aspects the document applies equally to SCR2 and SCR3.

8.2 Maintenance Overview

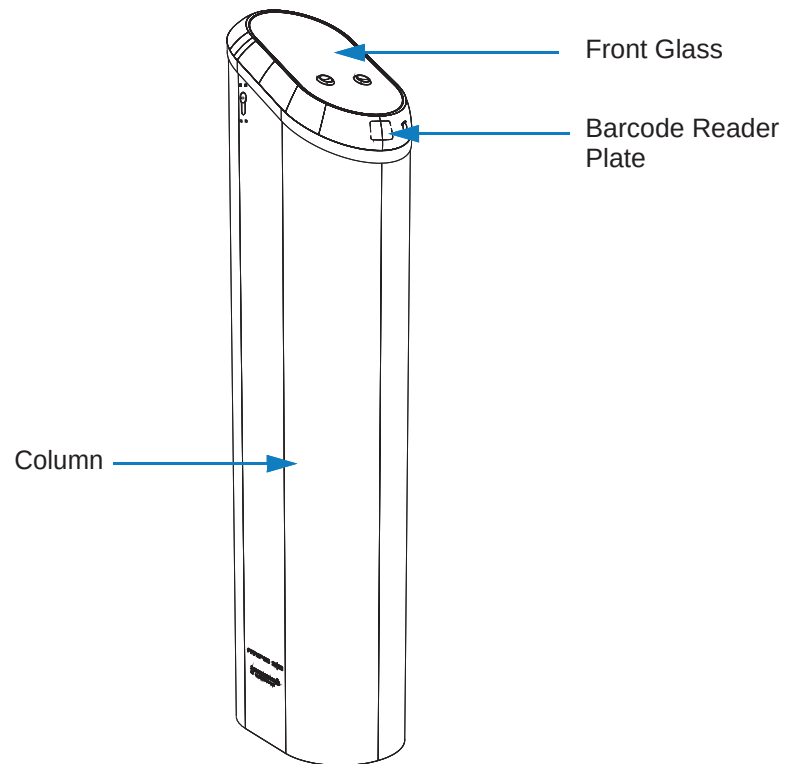


Figure 8-1 FareGo Val SV|51

Table 8-1 gives a quick overview of the general maintenance and cleaning cycles. Use this table to determine what procedures need to be accomplished, and when they should be scheduled.

8.3 Maintenance Overviews

This table gives a quick overview of the general maintenance and cleaning cycles. This table complements **Table 8-1**, which provides a summary of the Preventive Maintenance schedule.

General Maintenance and cleaning	1 MONTH	3 MONTHS	6 MONTHS	12 MONTHS	AS NEEDED
Cleaning and Visual Inspection of the Exterior	X				X

Table 8-1 General Maintenance and Cleaning

NOTICE

When the recommended preventive maintenance intervals have both a time period and a receipt usage maximum, then preventive maintenance must take place when either the time or the usage maximum is reached. These are maximum maintenance intervals, which may have to be reduced, and they assume average usage in a moderate environment. If certain devices are heavily used or exposed to atypical environmental conditions, such as extreme temperature fluctuations or nearby construction work, then preventive maintenance must be undertaken more frequently in order to reduce the amount and frequency of field maintenance. Operation and maintenance histories should be consulted and preventive maintenance procedures undertaken for those devices and locations where experience shows more frequent preventive maintenance will reduce field maintenance.

8.4 Materials

Table 8-2 provides a complete list of the materials required to perform exterior cleaning.

NOTICE

Please note the manufacturer's safety instructions on the products.

ITEM	PART NUMBER/ Description	WHERE USED
Heavy Duty Shop Cloths	Lint-free, soft	General use
Katun Foam Cleaner	Aerosol cleaner for plastic, glass, and metal	Plastic, glass, and non -stainless steel metal
Alcohol	Isopropyl, (70% min.)	Stainless steel

Table 8-2 Cleaning Materials

NOTICE

Do not use the Katun Foam Cleaner on the stainless steel surfaces.

8.5 Maintenance Procedures Follow these procedures for the preventive maintenance of the validator.

8.5.1 Cleaning and Visual Inspection of Exterior The exterior should be kept clean.

- Step 1** Clean the column and the base plate with a soft and lint-free cloth and alcohol (see section **8.4**).
- Step 2** Clean all parts of the exterior that are not made of stainless steel with a soft and lint-free cloth and Katum Foam Cleaner (see section **8.4**).
- Step 3** Visually check the front glass and the cover of the barcode reader for any cracks or other damage.
- Step 4** Visually inspect the entire exterior for damage.

Chapter 9 Troubleshooting

9.1 Overview

This chapter provides information about FareGo Val SV|51 error and failure identification. The first indication of a problem is usually a message displayed on the LCD screen. Responding to an error involves identifying the nature of the error and taking appropriate action to finish the transaction. Responding to a failure involves identifying the nature of the failure and taking appropriate action to restore the FareGo Val SV|51 to service. When service cannot be restored, faulty parts need to be replaced with operational ones.

NOTICE

Maintenance on validator equipment subject to outdoor environmental conditions should be performed ONLY if the following conditions are met:

- Temperature of the validator does not fall below -30 °C (-22 °F).
- Humidity must be between 5 % and 95 %, non-condensing.
- Rain and snow ingress during maintenance must be prevented.

These restrictions are necessary because exposure to severe environmental conditions such as cold temperatures, rain, snow, and wind, can cause serious and permanent damage to the equipment. PCBs (Printed Circuit Board) may malfunction and cease operation at temperatures below -30 °C (-22 °F). Exposure to rain or snow may lead to short circuits and resulting equipment damage.

NOTICE

Failure to follow these guidelines can lead to damages that will not be covered under the warranty.

In case of an error or failure of the validator always check the following:

- Make sure the device can power on.
- Make sure the correct software versions are installed on the device.

9.2 Verifying Software Versions

When troubleshooting, a maintenance technician should compare the software versions of the device with the expected versions. If the versions are different, the technician should ask the backend system operator to confirm that the current software versions are linked to the device. If this is the case, the device software can be updated via the backend system's maintenance of jobs.

9.3 Error Messages on Patron Display

NOTICE

The presentation of error messages in this chapter is exemplary. The error messages displayed on your device may look slightly different.

9.3.1 Out of Service

When the FareGo Val SV|51 is in Out of Service mode, the “Out of Service” screen shown in **Figure 9-1** is displayed. The device will not read any farecards.

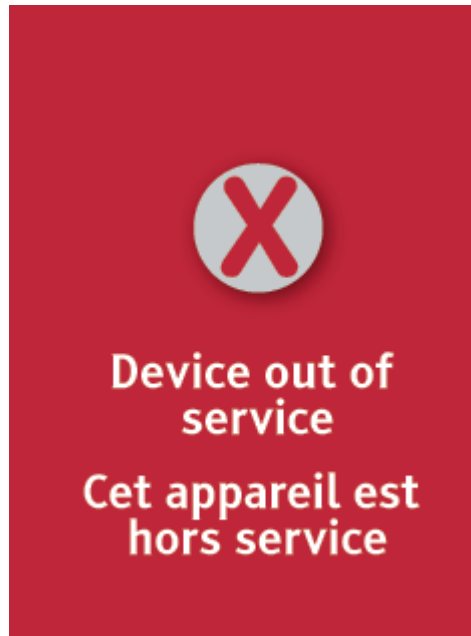


Figure 9-1 “Out of Service” Screen

When a critical alarm is detected, the validator switches to Out-of-Service mode. Possible causes include:

- MicroSD card access failure.
- Card reader failure.
- No currently active business configuration data or other software versions.

The solution is to remove and replace the base unit. If the failure persists, contacting the Helpdesk is the appropriate action.

9.4 Error Identification

When an error occurs, an indication of the error appears **on the LCD**. This is the first place to look for messages such as **Already Tapped** (see **Figure 9-2**). Errors interrupt one type of fare transaction.

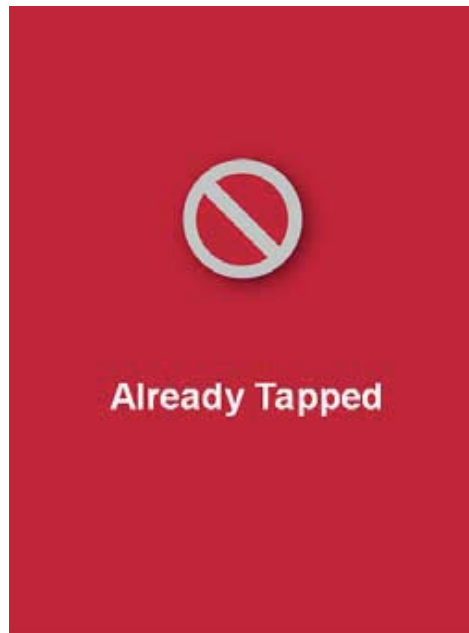


Figure 9-2 Already Tapped

9.4.1 Cash Supplement Required

A cardholder may invoke the screen shown in **Figure 9-3** if a farecard/stored value card with a period pass or a transfer product is tapped and cash supplement is required.

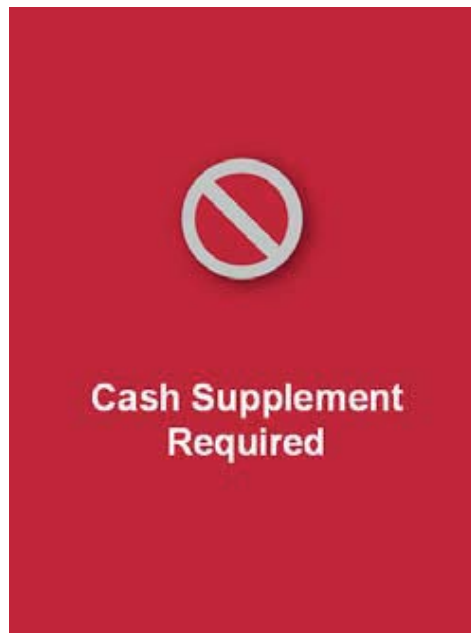


Figure 9-3 Cash Supplement

9.4.2 Cash Fare Required

When a cardholder taps a stored value card with an expired Transfer product and no Period Pass product, the screen in **Figure 9-4** appears.

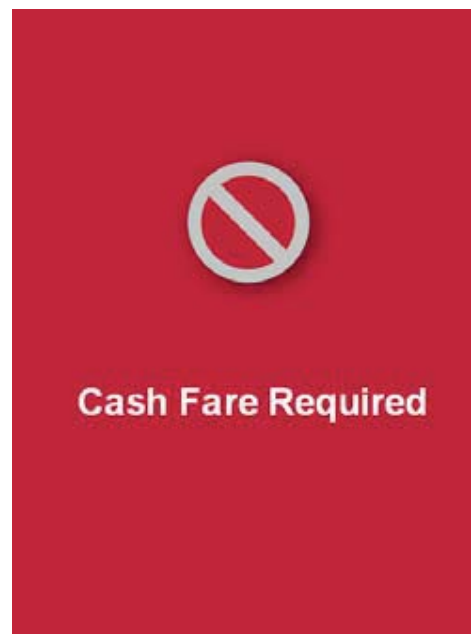


Figure 9-4 Cash Fare Required

9.4.3 Not Enough Funds, Reload Required

Under the following circumstances a cardholder may invoke the screen shown in **Figure 9-5**:

- Tapping a registered farecard with a negative stored value.
- Tapping an anonymous farecard with a stored value of zero.
- Tapping an anonymous farecard with a positive stored value that is less than the fare.

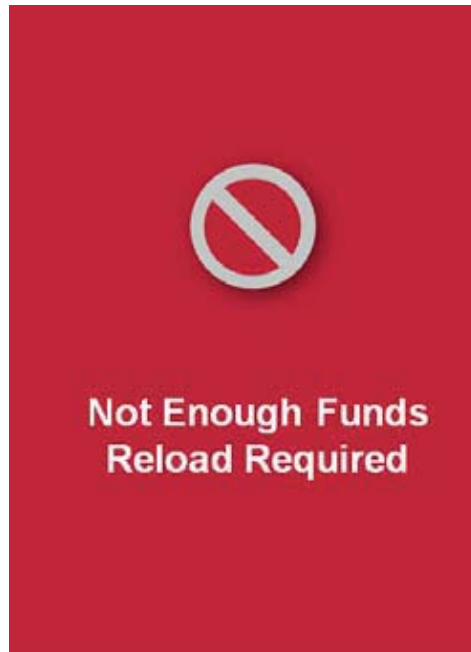


Figure 9-5 Funds Lacking

9.4.4 Card Read Error A card read error will cause the screen shown in **Figure 9-6** to appear.

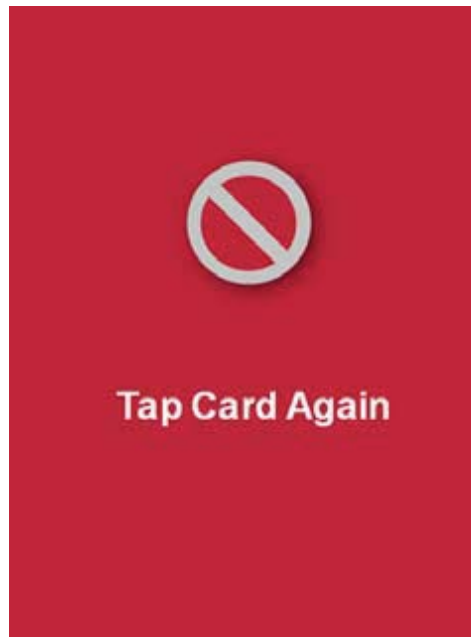


Figure 9-6 Farecard Read Error

9.5 Failure Identification

When a failure occurs, an indication of the failure appears on the LCD. This is the first place to look for messages such as **Blocked Card**.

9.5.1 Blocked Card

A failure occurs when a farecard tap on fails. The issue may be one of the following:

- Blocked farecard
- Farecard that has not been activated
- Card read/write error

When a cardholder taps a blocked card or a hot listed farecard or stored value card on the FareGo Val SV|51, the screen in **Figure 9-7** appears.

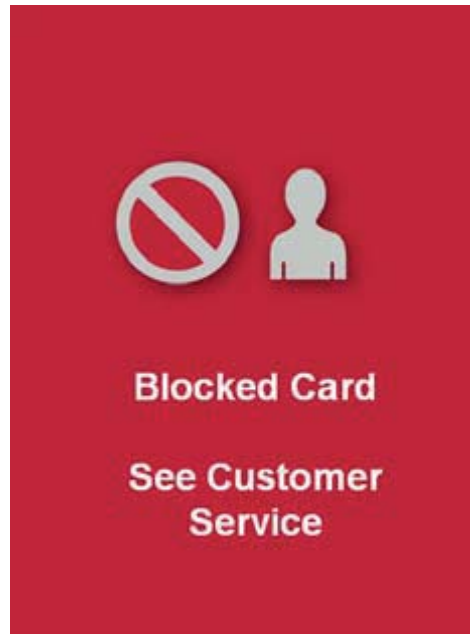


Figure 9-7 Blocked Card

9.5.2 Card Inactive

When a cardholder taps a not activated farecard on the FareGo Val SV|51, the screen shown in **Figure 9-8** appears.



Figure 9-8 Card Inactive

9.5.3 Card Error

When a cardholder taps an invalid farecard, the screen in **Figure 9-9** appears.

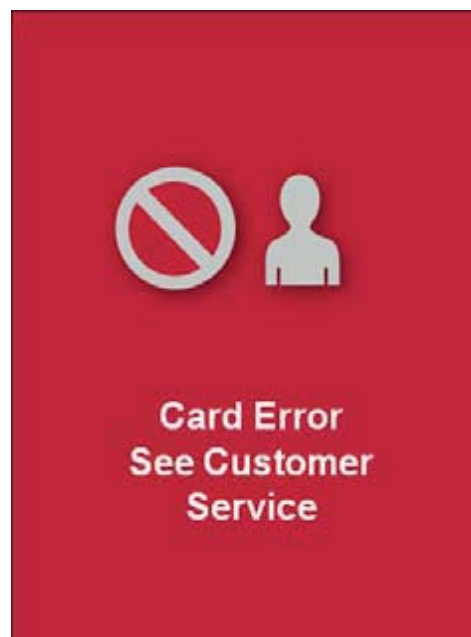


Figure 9-9 Card Error

9.5.4 Reversal Not Possible

When a cardholder tries to reverse a fare payment via the FareGo Val SV|51 where fare reversal is not processed, the screen in **Figure 9-10** appears.

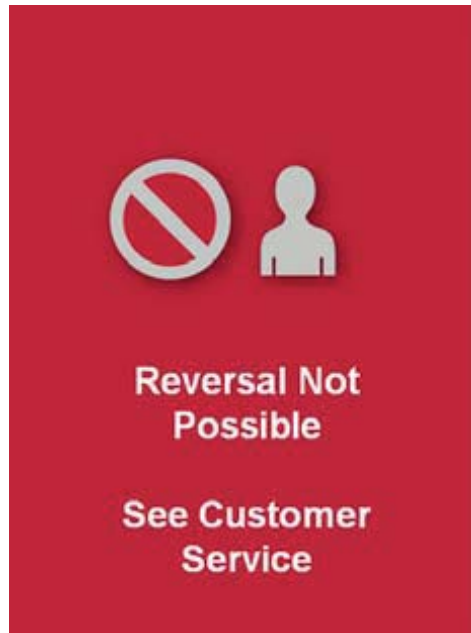


Figure 9-10 Reversal Error

9.6 Module Removal

This section discusses how to remove and replace components.

DANGER

Turn off power at the main facility breaker before proceeding.

As soon as the power supply of the device is stopped, it saves the open files and automatically switches off, according to the built in switch off logic.

NOTICE

The steps in the removal and replacement procedures assume the installers followed the installation procedures outlined in **Section 3.8.1** or **Section 3.8.2**. If there is not enough slack in the wires, as specified there, alternative steps must be followed, see **Section 9.7.4**.

9.6.1 Tools and Consumables

Device or Component Name	Part Number
E-Terminal SV 51 (Base Unit)	81 326710
Lock	81 326890
Key	81 326900
System MicroSD Card (including base image)	07347840
Backup MicroSD Card	51812770
Extension 1000 mm, 1/2"	66406370

Table 9-1 Part Numbers

9.6.2 Base Unit

9.6.2.1 Removal

The drawing in **Figure 9-12** illustrates how to remove the base unit from the column and how to disconnect it.

- Step 1** Use the key to unlock the device.
- Step 2** Slide the base unit up and then pull it up and away to disconnect it from the stainless steel column.
- Step 3** Remove the cable.

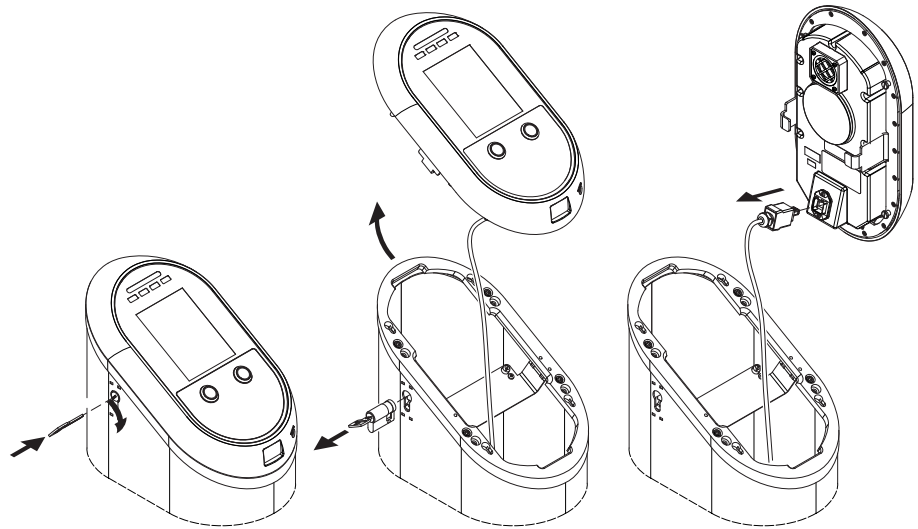


Figure 9-11 Base Unit Removal

9.6.2.2 Replacement

The drawing in **Figure 9-12** illustrates how to connect the base unit and how to attach it on the column.

- Step 1** Remove any foreign body from the inside of the validator (scraps, etc.), and clean.
- Step 2** Plug the cable into the new base unit.
- Step 3** Place the new base unit in the proper position on the stainless steel column and then press down and slide to connect.
- Step 4** Use the key to lock the device.

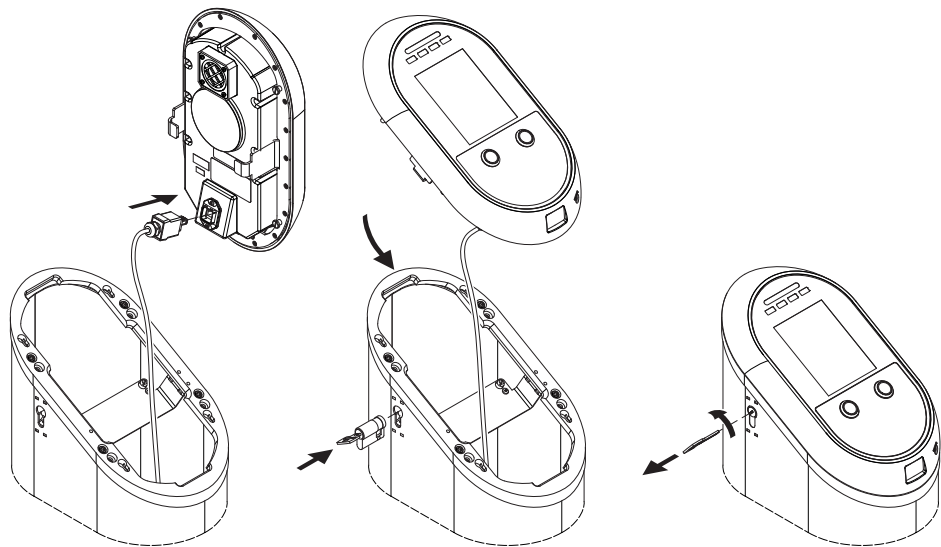


Figure 9-12 Base Unit Installation

9.6.3 Accessing the Power Supply

After removing the base unit as described in section **Section 9.6.2.1**, it is necessary to access the power supply junction box. Use **Figure 9-13** for reference.

- Step 1** Loosen the two screws attaching the power supply junction box to the power supply mount. Leave them attached to the backside of the power supply unit.
- Step 2** Pull the power supply junction box upward and then outward, away from the power supply mount.
- Step 3** Place the power supply junction box in a position convenient for removing the back cover.

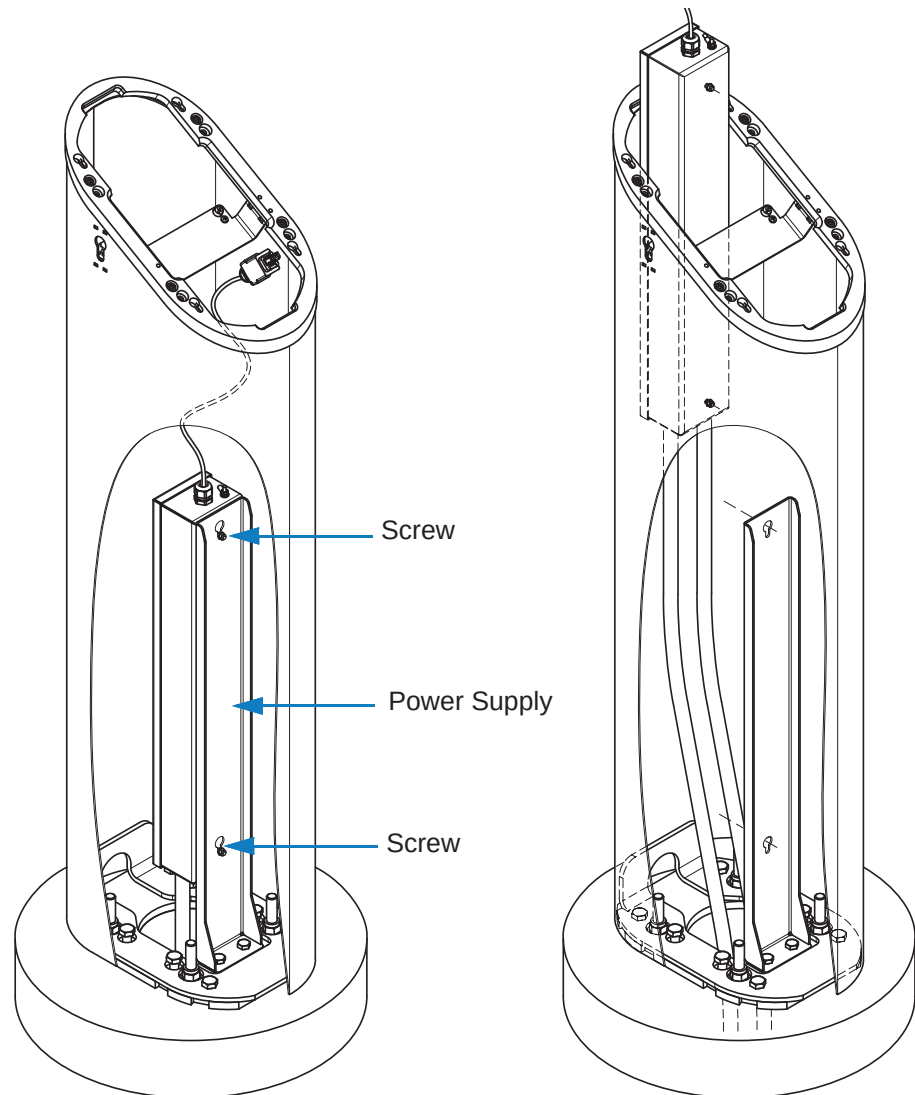


Figure 9-13 Accessing the Power Supply

- Step 4** Once the work inside the power supply junction box has been completed, lower the power supply junction box back into the column, insert the two screw heads into the two screw openings at the power supply mount and slide it down into position.
- Step 5** Tighten the two screws with a ratchet to secure the power supply junction box to its mount.

- 9.6.4 Alternative Procedure** If there is not enough slack in the wires to follow the preferred procedure for removing the power supply, follow these steps.
- Step 1** Turn off power at the main facility breaker before proceeding.
 - Step 2** Remove the base unit as specified in **Section 9.6.2**
 - Step 3** Remove the stainless steel column as described in the next steps.
 - Step 4** Remove all caulking around the base.
 - Step 5** Use the extended socket and ratchet to unscrew the four outer bolts that secure the column on top of the base plate. Put the four bolts in a safe place. They will be used to re-install the stainless steel column.
 - Step 6** Lift the stainless steel column up until there is enough clearance to avoid damaging any components and set it aside.
 - Step 7** At this point, it is possible to access the power supply.
 - Step 8** Follow the steps in **Section 9.6.5** (steps 2 to 6) to replace fuses.
 - Step 9** Re-install the stainless steel column as specified in **Section 3.10.8**.
 - Step 10** Re-install the base unit, as described in **Section 9.6.2.2**.

9.6.5 Fuse Replacement

The drawing in **Figure 9-14** shows how to replace the fuses in the base unit of the SV|51.

- Step 1** Remove the base unit as described in section **Section 9.6.5** and the power supply junction box as described in section **Section 9.6.3**.
- Step 2** Open the power supply junction box by removing the twelve screws and the cover. Set aside the screws.
- Step 3** Lift the appropriate fuse cover and remove the blown fuse.
- Step 4** Insert a new fuse.
- Step 5** Close the fuse cover.
- Step 6** Replace the cover and reinsert all twelve screws. Tighten appropriately.
- Step 7** Align the two screw openings at the power supply mount with the two screw heads of the power supply junction box and slide it into position.
- Step 8** Tighten the two screws with a ratchet to secure the power supply mount to its holder.

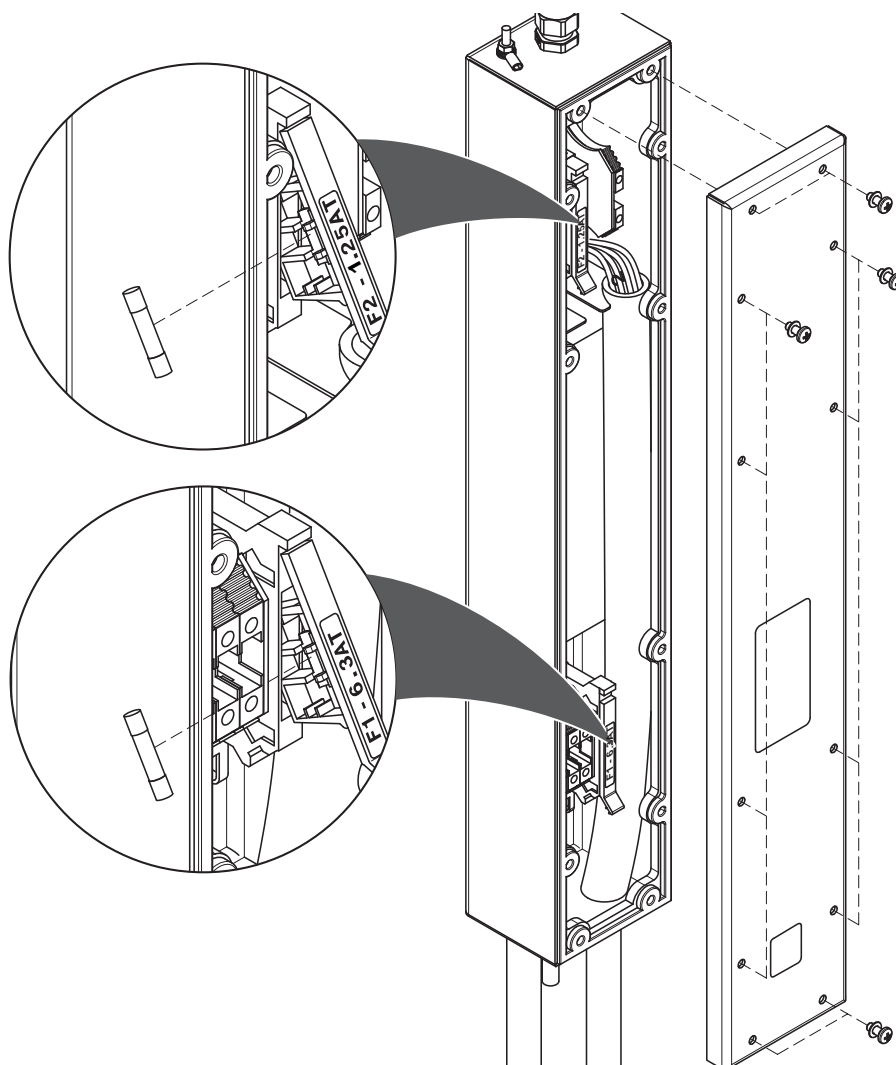


Figure 9-14 Fuse Replacement

- Step 9** Re-install the base unit as described in **Section 9.6.2.2**.

9.6.6 Backup MicroSD Card Removal and Replacement

The drawing in **Figure 9-15** shows where to remove and replace the backup microSD card in the base unit.

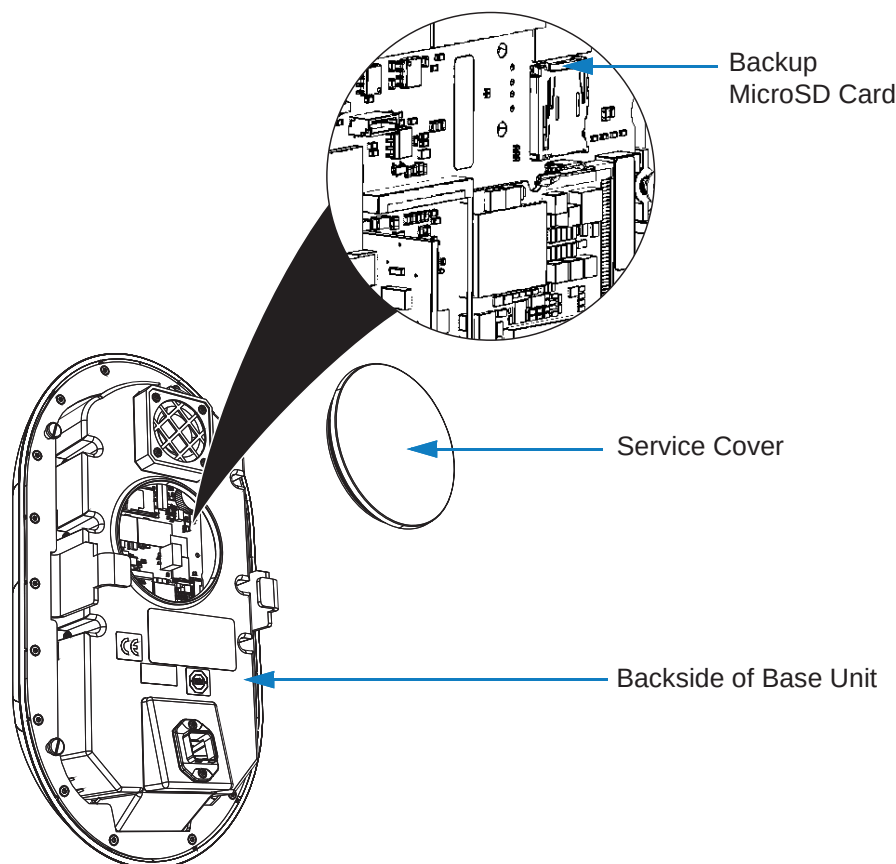


Figure 9-15 Location of Backup MicroSD Card

- Step 1** Remove the base unit as described in **Section 9.6.2.1**.
- Step 2** Remove the service cover as shown in **Figure 9-15**.
- Step 3** To remove the backup microSD card from the slot press it gently into the slot. It is spring loaded and will pop up for removal.
- Step 4** To replace, push the backup microSD card into the respective slot (**Figure 9-15**) until it clicks into place.
- Step 5** Close the service cover, see **Figure 9-15**.
- Step 6** Reinstall the base unit on the stainless steel column as described in **Section 9.6.2.2**.

NOTICE

Only the shown backup microSD card gets replaced in the field. S&B will ship the device with the system microSD card on the CPU module inserted.

9.7 Returning the Validator to Service

9.7.1 System MicroSD Card

Replacement devices will be pre-initialized. The system provider is not responsible for either initialization or creation of system microSD cards (system initialization modules).

9.7.2 Import Backup

If a backup microSD card is used, you can transfer the data from the backup microSD card of the old device to the replacement device.

NOTICE

The backup module holds the last shift data and the device ID only.

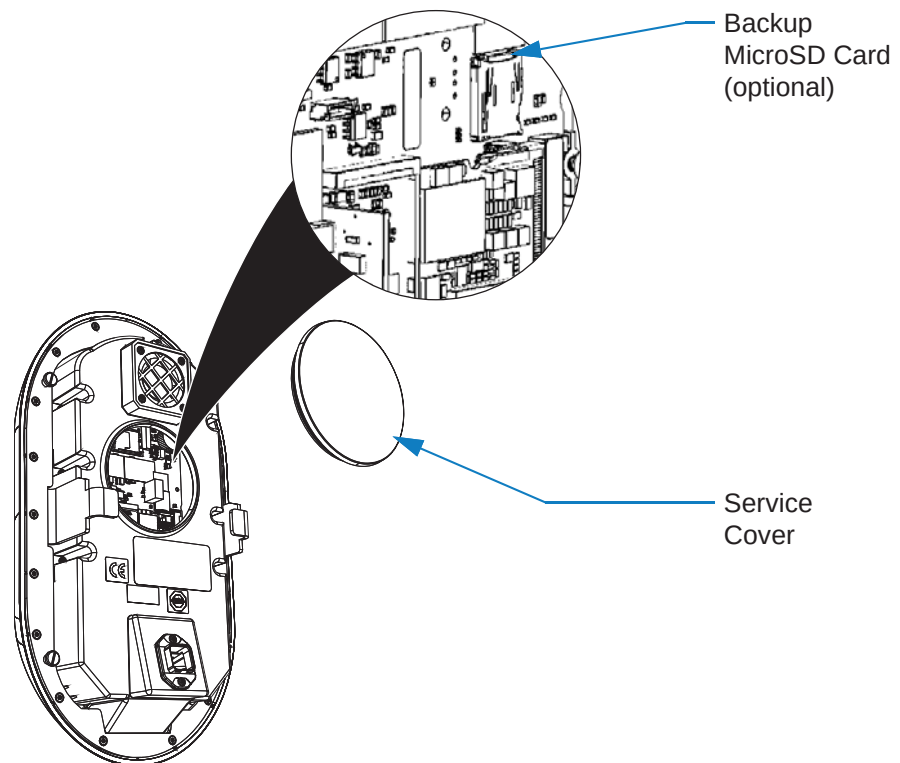


Figure 9-16 Backup MicroSD Card

Step 1

If the device is faulty, transfer its backup microSD card to the new device.

When powered on (see **Section 9.7.6**), the device initialization through the backup microSD card will be completed with a synchronization. There will be no loss of device data.

NOTICE

Avoid using an empty backup card. Only use an empty card during a device swap if the original backup module is lost, defective, or the entire device/backup combination is not available.

Maintenance staff should be careful not to damage or lose backup modules when swapping faulty devices, because all backed up data will be lost. Users may determine if a device backup module is faulty by checking the backend system.

9.7.3 New Backup MicroSD Card

Only if no backup is available, use a new backup microSD card. No configuration is needed for the initialization of the new backup microSD card (backup module).

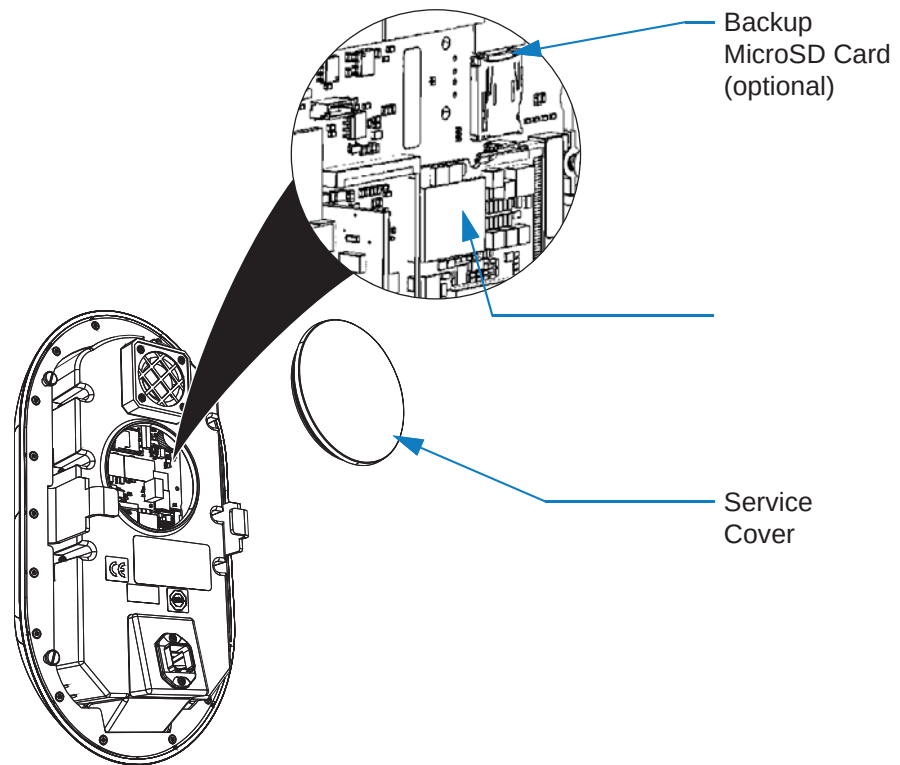


Figure 9-17 Backup MicroSD Card

Step 1

Insert the empty microSD card in the corresponding backup microSD card slot.

When powered on (see **Section 9.7.6**), the device will recognize the empty microSD card and will initialize it automatically. If the device detects a non-empty microSD card, the device will reject the microSD card and remain out of service.

Spare backup microSD cards will be provided with each spare device. The service provider is responsible for providing additional spare backup modules.

9.7.4 Recovery Scenarios

If the base unit is faulty and the backup microSD card is still intact, follow Recovery Scenario 1. If the backup microSD card is lost, damaged, or defective but the base unit is functional, follow Recovery Scenario 2. If both the base unit and the backup microSD card are damaged (a double failure), follow Recovery Scenario 3.

NOTICE

The following description needs to be updated.

9.7.4.1 Recovery Scenario 1

If the base unit is faulty and the backup microSD card is still intact, follow these steps.

- Step 1** Turn off power at the main facility breaker.
- Step 2** Remove the faulty base unit from the column, see **Section 9.6.2**.
- Step 3** Open the service cover on the back and remove the backup microSD card from the malfunctioning base unit (spring loaded, pressing it down will pop it up for removal). It is a small module; be careful handling it.
- Step 4** Take out the EEPROM from the old device.
- Step 5** Open the service cover of the new device.
- Step 6** Insert the working microSD backup card from the faulty base unit into the new base unit.
- Step 7** Replace the EEPROM by the one taken from the old device.
- Step 8** Close the service cover.
- Step 9** Install the new base unit on the column, see **Section 9.6.2**.
- Step 10** Start the device by turning on power at the main facility breaker.
- Step 11** FareGo Val SV|51 goes through a recovery process (configures IP, data, transactions, etc.).
- Step 12** FareGo Val SV|51 will reboot after the recovery process. At this point the device is identical to the failed one.
- Step 13** Turn on the device and synchronize to backend system (to receive updated lists / version data); make sure that the FareGo Val SV|51 is operational and communicating online.
- Step 14** DATA STATUS: NO data loss.

9.7.4.2 Recovery Scenario 2

If the backup microSD card is lost, damaged, or defective but the base unit is functional, follow these steps.

- Step 1** Remove the base unit from the column without disconnecting it, see **Section 9.6.2.1**. If necessary, remove the faulty backup module.
- Step 2** Insert a formatted new microSD card into the backup microSD card slot. The device auto recovery function will copy the correct Backupmodul.ini file onto the new card (ini file is now also saved on device internal hard disk) and backup the data.
- Step 3** Mount the base unit on the column again, see **Section 9.6.2.2**
- Step 4** DATA STATUS: NO data loss - All transaction data will be retrieved from the working FareGo Val SV|51 and uploaded to the backend system.

9.7.4.3 Recovery Scenario 3

If both the base unit and the backup microSD card are damaged (a double failure), follow these steps.

- Step 1** Turn off power at the main facility breaker.

- Step 2** Remove the damaged base unit from the column; it needs to be replaced.
- Step 3** Send the base unit (along with its backup microSD card) to the Central Repair Depot to attempt retrieval of the shift files (data recovery may not be possible depending on the extent of the damage).
- Step 4** Open the service cover of a new base unit and insert a new backup microSD card with the file Backupmodule.ini with the correct ID setting stored on it, see **Section 9.8**. The ID setting will be the same as the one on the original backup module. It can also be seen under “Extended Parameters” in “Device Maintenance”. The FareGo Val SV|51 will configure itself and use the microSD card as backup module when it is powered on.
- Step 5** Install the new base unit on the column.
- Step 6** DATA STATUS: Possible Loss. The transaction data generated since the last synchronisation is at risk of being permanently lost in the case of the dual failures of both the base unit and the backup module. If the main logic board of the base unit is intact, or if the microSD card can still be read, then data recovery at the Central Repair Depot may be possible.

9.7.5 Initial Check

Complete the following checklist before turning on the validator:

- ✓ Verify that all screws have been tightened firmly.
- ✓ Ensure that the equipment is properly grounded.
- ✓ Ensure that power supply is installed and is working correctly.
- ✓ Check the state of the fuses (power supply side).
- ✓ Verify that all wires are firmly connected.
- ✓ Verify that you have not forgotten anything inside the device.

9.7.6 Turn on Power

Turn on power at the main facility breaker. When the power supply is switched back on, the validator automatically returns to operation.

9.8 ID Number of Validator

The format for the ID number in the Backupmodule.INI file is as follows: AABBBBBBCC, where AA is the provider number, BBBBBB is the 6 digit device ID (such as 020001), and CC is the position of the FareGo Val SV|51 (00, 01, 02...). Thus, an example number would be 1202000103. This information is also available by opening the INI file in notepad, and is easily set.

Here is an example:

Backupmodul.ini Identifier=1299999903

Provider ID 12

Device ID 999999

4th FareGo VAL SV|51 (Position number 03)

Chapter 10 Glossary

10.1 Glossary of Terms and Abbreviations

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

AFC	Automated Fare Collection
AWG	American Wire Gauge
Aztec Code	2D barcode designed by Andrew Longacre at Welch Allyn (now Honeywell Scanning and Mobility). Public domain. International Standard: ISO / IEC 24778.

B

Boot	Bootting is the process of starting a computer
-------------	--

C

CAD / AVL	CAD / AVL (Computer Aided Dispatch and Automatic Vehicle Location System) is the British and American counterpart of the RBL standard widely used in Germany. The objective of the system is to monitor the positions of buses and trains on their planned routes and be able to provide passenger information in buses and trains as well as at stops. In addition, there is also the possibility to control communication between the driver or CAD / AVL system and the control center. CAD / AVL is similar to the German RBL which has been superseded by ITCS.
Calypso	Calypso is an international electronic ticketing standard for microprocessor contactless smart cards, originally designed by a group of transit operators from 11 countries including Belgium, Germany, France, Italy, Latvia, Portugal, Canada and others.
CE	Communauté Européenne Communauté Européenne marking is a certification mark that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA).
CMOS	Complementary Metal-Oxide-semiconductor Structure Complementary Metal-Oxide-semiconductor Structure is a set of semiconductor technologies for building integrated circuits and the corresponding circuitry of microcircuits.
Codabar	1D Barcode. Codabar is a numeric code with some additional special characters (0..9 and - \$: / . +). There are four different start and stop signs defined.
Code 128	1D Barcode. Code 128 Auto can encode the complete ASCII-character set. This is done by switching between all 3 character sets of Code 128.

Code 39 1D Barcode. Code 39 is an alphanumeric code. Each character is built by 9 elements (5 lines and 4 spaces) where 3 are thick and 6 are thin. This allows the self-checking of code 39. Code 39 does not require a build-in check digit. The main advantage is the wider character set.

CSA Canadian Securities Administrators
CSA is a not for profit standards organization which develops a wide range of standards for Canadian industry including standards on energy, electrical, construction, quality management, health care, environment, and information technology.

D

Data Matrix 2D Barcode from Microscan Systems, formerly RVSI Acuity CiMatrix/Siemens. Public domain. Increasingly used throughout the United States. Single segment Data Matrix is also termed Semacode. - International Standard: ISO/IEC 16022.

E

E1 Part of an approval mark provided for by the Regulations annexed to the Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (so-called UN/ECE Regulations) for fitting to equipment and parts. Here with the country code "1", which stands for Germany. In the case of a complete approval mark, the approval number and, where appropriate, the number of the international agreement containing the letter "R" and, where appropriate, additional symbols shall be affixed in the vicinity of this circle.

EAN-13 1D Barcode. The EAN barcode is primarily used in supermarkets to identify product at the point of sales. The products contain the EAN number or GTIN (Global Trade Item Number) to identify itself.

EAN-8 1D Barcode. EAN 8 is the short form of EAN-13. This code is only used if the article is too small for an EAN-13 code. The restrictions for this are very hard. An EAN-8 will only be granted if a EAN-13 will uses more than 25% of the front space of the article.

EEPROM Electrically Erasable Programmable Read-Only Memory
A non-volatile memory used, for example, to store small amounts of device specific data that can be erased and reprogrammed.

EMV Europay International, MasterCard und VISA
Europay International, MasterCard and VISA is a specification for payment cards equipped with a processor chip and the associated smart card devices.

ESD Electrostatic Discharge
Electrostatic discharge is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown. The ESD occurs when differently-charged objects are brought close together or when the dielectric between them breaks down, often creating a visible spark.

F

FareGo The FareGo product brand is a complete system solution offered by Scheidt & Bachmann for all fare management requirements of public transport systems.

Only for FGD CS:
The first-class solution portfolio is characterized by innovation strength and high quality requirement. FareGo consists of innovative hardware, modular software and customized services and covers all aspects of the ticketing sector. High user friendliness and modern design are significant features of our products.
The clearly-arranged structured brand architecture offers our customers guidance during the conception of their ticket management system. The individual products of the comprehensive portfolio were compiled into product lines:

- FareGo Sales: Sales systems
- FareGo Val: Validators
- FareGo Gate: Entry and exit control
- FareGo Move: Mobile terminals
- FareGo Data CS: Software
- FareGo Life: Lifecycle services

Whether a local operator or a bus line, supra-regional or operator of a multi-mode transport network or participant of a multi-operator system - FareGo supplies the right solution for ticketing in public transport systems!

FCC Federal Communications Commission
This is an independent agency of the United States government created to regulate interstate communications by radio, television, wire, satellite, and cable. The FCC maintains jurisdiction over the areas of broadband access, fair competition, radio frequency use, media responsibility, public safety, and homeland security.

FCS Fare Collection Systems, one of four business areas of Scheidt & Bachmann Fare Collection Systems GmbH

I

IBIS Integriertes Bordinformationssystem (german), which is the integrated on-board information system.

ID Identification Number

IEC International Electro-Technical Commission
The IEC is an international standards organization for standards in the field of electrical engineering and electronics with headquarters in Geneva.

Interleaved 2 of 5 1D Barcode. Code 25 Interleaved is a special type of Code 25 that is also a numeric code able to display digits from 0 to 9. The code is also known as Code 2 of 5 Interleaved.

ITSO ITSO is a national railcard system used in the United Kingdom

L

LCD Liquid Crystal Display

M

Maxicode 2D Barcode used by United Parcel Service. Now public domain.

MCL MasterCard contactless
MasterCard Contactless is compatible with EMV contactless payment technology. Based on the ISO / IEC 14443 standard, which provides MasterCard and Maestro card holders with a way to make a payment by touching a payment card or other payment tool, such as a smartphone to a reader on a payment terminal instead of swiping it through a read or insert it to the terminal.

MIFARE The brand name covers proprietary solutions based upon various levels of the ISO/IEC 14443 Type A 13.56 MHz contactless smart card standard.

MSHA Mine Safety and Health Administration
The Mine Safety and Health Administration is an agency of the United States Department of Labor which administers the provisions of the Federal Mine Safety and Health Act of 1977 (Mine Act) to enforce compliance with mandatory safety and health standards as a means to eliminate fatal accidents, to reduce the frequency and severity of nonfatal accidents, to minimize health hazards, and to promote improved safety and health conditions in the nation's mines.

MSI 1D Barcode. The MSI Plessey barcode has been designed by the Plessey Company, England in 1971. It has been used in libraries and stores.

N

NEC National Electrical Code
The National Electrical Code, or NFPA 70, is a regionally adoptable standard for the safe installation of electrical wiring and equipment in the United States.

NFC Near-field communication
Near-field communication is a set of communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them within 4 cm (1,57 ") of each other.

NFPA 70	National Fire Protection Association NFPA 70 is a part of NEC directive. See NEC.
NRTL	Nationally Recognized Testing Laboratory Nationally Recognized Testing Laboratory is the term used by the United States Occupational Safety and Health Administration to identify third-party organizations that have the necessary qualifications to perform safety testing and certification of products covered within OSHA and each organization's scopes.
NWC	Network Controller A network controller is a computer hardware component that connects a computer to a computer network

O

OEM	Original Equipment Manufacturer An original equipment manufacturer is a company that produces parts and equipment that may be marketed by another manufacturer.
OSHA	Occupational Safety and Health Administration The Occupational Safety and Health Administration is an agency of the United States Department of Labor. This agency is responsible to "assure safe and healthy working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.

P

payWave	payWave (Visa) is a contactless payment technology feature that allows cardholders to wave their card in front of contactless payment terminals without the need to physically swipe or insert the card into a point-of-sale device.
PCB	Printed Circuit Board
PDF 417	2D Barcode originated by Symbol Technologies. Public domain. International standard: ISO/IEC 15438

Q

QR Code	2D Barcode initially developed, patented and owned by Denso Wave for automotive components management; they have chosen not to exercise their patent rights. Can encode Latin and Japanese Kanji and Kana characters, music, images, URLs, emails. De facto standard for Japanese cell phones. Used with BlackBerry Messenger to pick up contacts rather than using a PIN code. The most frequently used type of code to scan with smartphones. Public Domain. – International Standard: ISO/IEC 18004
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R

RED Radio Equipment Directive
The Radio Equipment Directive deals with the placing on the market of radio-electric equipment. All product in scope of this directive and placed on the EU market must be compliant with this directive.

S

S&B Scheidt & Bachmann.

SAM Secure Access Module
A Secure Access Module (or Secure Application Module) is based on SmartCard Integrated circuits and is used to enhance the security and cryptography performance in devices, commonly in devices needing to perform secure transactions, such as payment terminals. It can be used for cryptographic computation and secure authentication against smart cards or contactless EMV cards.

SBC Compact Scheidt & Bachmann Computer Compact

SCR Smart Card Reader

T

TÜV Technischer Überwachungsverein
TÜV (Technical Inspection Association) are German businesses that provide inspection and product certification services.

U

UPC-A 1D Barcode. The UPC A code is the standard version of the UPC code and has 12 digits. It is also called UPC 12 and is very similar to the EAN code.

UPC-E 1D Barcode. The UPC E code is a short version with 8 digits, always starting with a zero.

V

Vicinity Vicinity is an card ISO standard for i.e. cards which can be read from a greater distance as compared with proximity cards. Such cards can normally be read out by a reader without being powered themselves, as the reader will supply the necessary power to the card over the air (wireless).

Chapter 11 Appendix

11.1 Additional Documents

This chapter shows all documents which are attached to the pdf version of this document.

You are able to find attached documents as shown in **Figure 11-1**.

Click on the paperclip symbol on the left edge of the opened pdf document.

NOTICE

If this manual is printed from the PDF version, the attached files will not automatically be included.

If the attached files are needed in printed form, each attached file must be printed separately.



Figure 11-1 Location of attachments (this picture shows an example)

Drawing No.	Description
0377363 0 E_Mounting.pdf	Mounting Instructions
0378352 0 E_Cable Plan_Base Unit.pdf	Cable Plan Base Unit
SBSCR2_SecurityGuidance_LifeCycle.pdf	Security Inspection Manual
51813140_Barcode Reader_Honeywell_N4680 2D.pdf	Barcode Reader Manual
51813320_Power Supply Unit.pdf	Power Supply Unit Datasheet

Table 11-1 Appendix