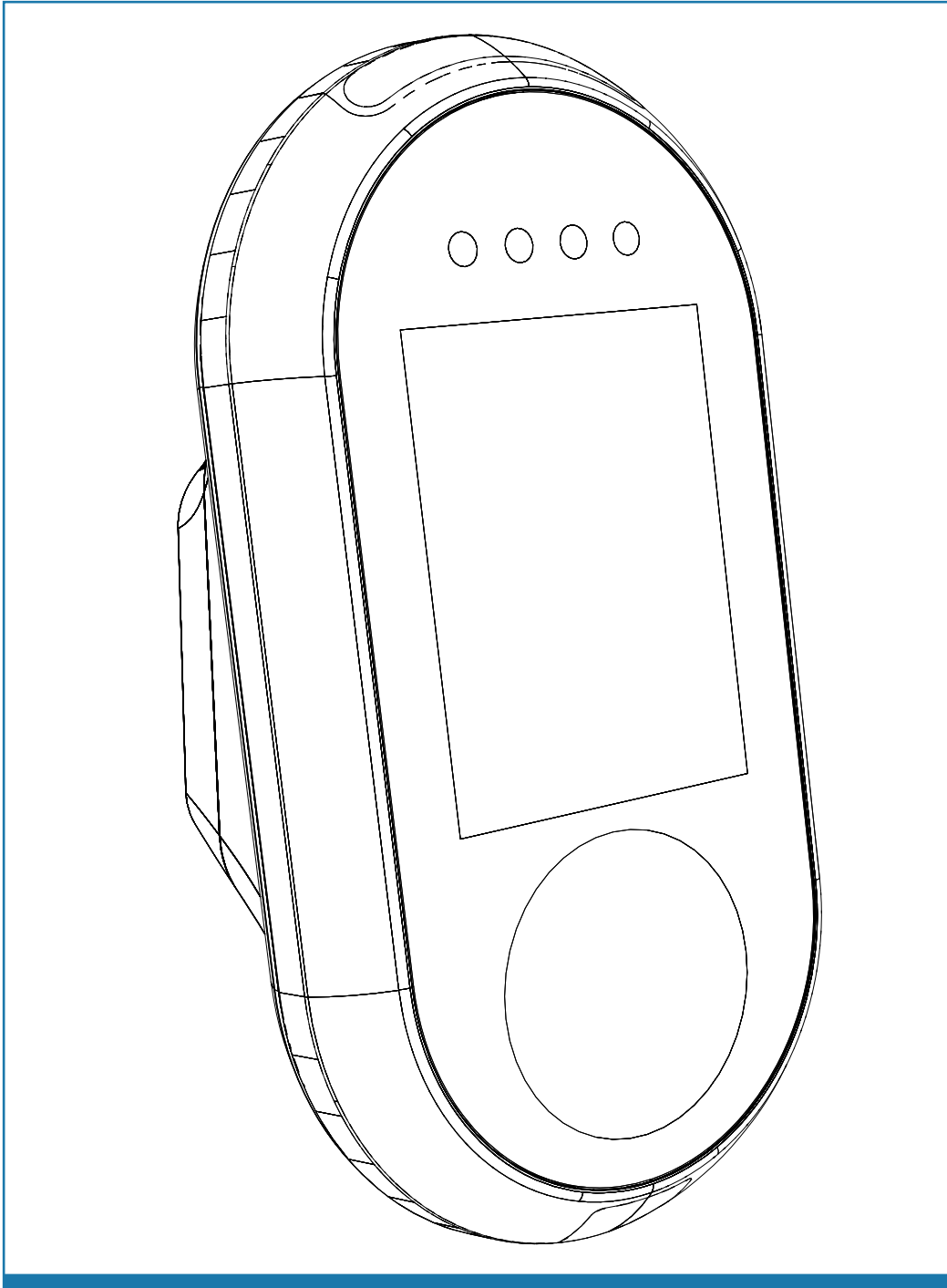


Customer Documentation

State: December 2017

FARE^{VAL}-GO OV 41



This manual, including all of its component parts, is copyright protected. Scheidt & Bachmann GmbH reserves all rights to its contents. Any use not expressly approved by copyright law is subject to prior approval by Scheidt & Bachmann GmbH. This applies particularly to copying, processing, translations and microfilming, as well as to storage and data processing in any electronic systems.

All contents of this manual shall be treated confidentially and shall not be transferred to any third party, either for their own commercial use or for any other client.

Since all information and facts are subject to technical changes, any liability for the data contained is hereby disclaimed. Modifications of technical details, in terms of information and illustrations are reserved. Make sure to follow the updating index. Scheidt & Bachmann GmbH cannot be held responsible for direct damage and/or possible consequential damage due to misuse by the customer or by third parties, unless the Product Liability Act (ProdHaftG) is concerned. In no event shall Scheidt & Bachmann GmbH be liable for any damage out of or in connection with the provision of the manual.

© 2017 Scheidt & Bachmann GmbH, Fare collection system (FCS)

Breite Straße 132 41238 Mönchengladbach

www.scheidt-bachmann.com

Subject to change.

History

Version	Date	Change	Edit
1.00	01.12.2016	Start Version	Stevens
1.01	31.03.2017	Reduced the contents of the manual to OV 41 relevant topics	Stevens
1.02	03.04.2017	Changes made according to specifications from the design department	Stevens
1.03	05.07.2017	Information on radio frequencies added	Stevens
1.04	21.08.2017	Changes made according to specifications from the design department (C.Gerspacher)	Stevens
1.05	15.09.2017	Changes made according to specifications from the design department (N.Huendgen.)	Stevens
1.06	13.12.2017	Changes made according to specifications from the design department (N. Huendgen. and I. Izler)	Stevens

Table 1-1

Chapter 1 Introduction and Safety Considerations

1.1	Overview	1-7
1.2	Manual Organization	1-7
1.3	Safety	1-8
1.4	General Safety Guide	1-9
1.5	Protective Equipment	1-10
1.6	Special Tools	1-10
1.7	Use of Symbols in Manual.....	1-10
1.7.1	Warning Symbol	1-10
1.7.2	Caution Symbol	1-10
1.7.3	Information Symbol.....	1-10
1.7.4	Example Symbol.....	1-10
1.7.5	Finger Tip Maintenance Symbol	1-11
1.7.6	Tools Symbol	1-11
1.7.7	Electrical Hazard Symbol.....	1-11
1.7.8	Electrostatic Discharge Symbol.....	1-11
1.7.9	Hot Hazard Symbol.....	1-12
1.7.10	Maintenance Cycle Symbol	1-12
1.8	Device Safety Labels	1-12
1.8.1	Labels On the OV 41.....	1-13
1.8.1.1	Label Locations	1-13
1.8.1.2	CE Label.....	1-14
1.8.1.3	FCC License Label.....	1-14
1.8.1.4	TÜV SÜD NRTL Label	1-14

Chapter 2 Glossary

2.1	Glossary of Terms and Abbreviations	2-15
------------	--	-------------

Chapter 3 Declaration of Conformity

3.1	Europe	3-27
3.2	USA/CANADA	3-28

Chapter 4 Troubleshooting and Module Removal

4.1	Troubleshooting Overview	4-31
4.1.1	Out of Service	4-31
4.2	Error Identification	4-32
4.2.1	Blocked Card	4-37
4.2.2	Card Error	4-38
4.2.3	Recovery Scenarios	4-45
4.2.3.1	Recovery Scenario 1	4-45
4.2.3.2	Recovery Scenario 2	4-46
4.3	Verifying Software Versions	4-47
4.4	Tools and Consumables	4-47

Chapter 5 Preventive Maintenance

5.1	General Maintenance and Cleaning	5-49
5.2	Preventive Maintenance Schedule Summary	5-50
5.3	Materials and Replacement Parts	5-50

Chapter 6 OV|41 Installation

6.1	Overview	6-51
6.2	Hardware	6-51
6.3	Dimension and Weight	6-51
6.4	Power Requirements	6-51
6.5	Operating Features	6-54
6.5.1	OV 41 Mounting and Environmental Considerations	6-54
6.6	Installation Requirements	6-55
6.6.1	Materials	6-55
6.6.2	Standard Tools	6-55
6.6.3	Special Tools	6-55
6.7	Needs and Requirements for OV 41 Installation	6-55
6.8	Installation	6-56
6.9	Post-Installation Checklist	6-62
6.10	Disassembly and Removal	6-62

Chapter 7 OV|41 Initialization

- 7.1 Initialization 7-63
- 7.1.1 Initialize OV|41 With New System Software 7-63

Chapter 1 Introduction and Safety Considerations

1.1 Overview

The OV|41 (On-Board Validator 41) Repair and Maintenance Manual provides complete, detailed instructions for operating, maintaining, and troubleshooting the OV|41. Comprehensive charts, tables, graphs, and other diagrams provide a technical document that is easy to use and understand.

Full documentation that would be needed by maintenance personnel is available through Scheidt & Bachmann. The manual assumes that comprehensive repair procedures will be performed by fully trained contractor technicians.

This manual reflects Scheidt & Bachmann's commitment to providing our customers with comprehensive technical documentation, along with training guidelines to augment our customer training program.

1.2 Manual Organization

The organizational structure of the OV|41 Repair and Maintenance Manual is outlined below.

Chapter 1 – Introduction

Chapter 2 – Glossary

Chapter 3 – Declaration of Conformity

Chapter 4 – Troubleshooting and Module Removal

Chapter 5 – Preventive Maintenance

Chapter 6 – OV|41 Installation

Chapter 7 – OV|41 Initialization



PLEASE READ THIS MANUAL AND ALL REFERENCED DOCUMENTS CAREFULLY BEFORE ATTEMPTING TO INSTALL THIS AFC EQUIPMENT. FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL AND THE INSTRUCTIONS OR NOTES IN THE INSTALLATION DRAWINGS MAY CAUSE INJURY TO YOURSELF OR DAMAGE TO THE EQUIPMENT AND MAY ULTIMATELY COMPROMISE THE OPERABILITY OF THE EQUIPMENT!

All Automated Fare Collection (AFC) equipment is TÜV-SÜD-NRTL 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 requirements.

When measuring for position, always use the center of the device as the reference point.

- 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.

Scheidt & Bachmann GmbH

DISCLAIMER



Scheidt & Bachmann 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 GmbH. TO ITS CUSTOMERS.

1.3 Safety

This section describes safety requirements for technicians who perform maintenance or repair procedures for all AFC Systems. Information provided in this chapter also includes a description of safety warnings and precautions.



PLEASE READ THIS MANUAL AND ALL REFERENCED DOCUMENTS CAREFULLY BEFORE ATTEMPTING TO WORK WITH THIS EQUIPMENT. FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS ENTIRE MANUAL MAY CAUSE INJURY TO YOURSELF OR DAMAGE TO THE EQUIPMENT AND MAY ULTIMATELY COMPROMISE THE OPERABILITY OF THE EQUIPMENT!

DISCLAIMER



Scheidt & Bachmann 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 GmbH TO ITS CUSTOMERS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY INVALIDATE ANY OR ALL WARRANTIES, EXPRESS OR IMPLIED.

NOTE:

NOT ALL OF THESE WARNING LABELS OR HAZARDS MAY EXIST IN ALL AFC DEVICES. ONLY THOSE LABELS THAT APPLY TO THE OV41, AND ARE REQUIRED TO MEET TÜV-SÜD-NRTL CERTIFICATION REQUIREMENTS, WILL BE FOUND IN THE OV41. BE CAUTIOUS AND OBSERVANT, AND LOOK FOR SUCH WARNING LABELS AND POTENTIAL HAZARDS. ANY TECHNICIAN OR PERSON ACCESSING THE INTERIOR OF ANY AFC DEVICE SHOULD USE COMMON SENSE AND EXERCISE EXTREME CAUTION.

Safety Features

Safety engineering is an integral part of Scheidt & Bachmann's designs. Maintenance technicians must perform maintenance and repair in accordance with industry safety standards including MSHA, OSHA, and other Federal, State, and Local codes and regulations.

Close attention to proper safety precautions is of the utmost importance. Components should be installed, maintained, and repaired only by trained, qualified personnel using reasonable care. Improper installation, maintenance, or repair procedures may damage the device or cause serious personal injury or death.

The following pages provide detailed information on safety precautions that must be observed when working on AFC Systems. This information should be carefully read and thoroughly understood before performing routine maintenance or attempting to troubleshoot or repair the device.

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 other persons who work with the internal systems of any AFC systems should also be trained in safety.

1.4 General Safety Guide

This chapter provides the technician with the safety information necessary to avoid personal injury or equipment damage. Only qualified, trained technicians using reasonable care should perform maintenance or repair. As with any mechanical system, the AFC components can pose certain safety hazards. The following guidelines must be followed when working on the mechanical systems of any AFC Systems or Components.

- Only competent, qualified technicians trained by Scheidt & Bachmann should service this device.
- Service technicians must read and understand all operating and service instructions.
- Turn electrical power off before opening any electrical enclosure.
- Do not operate the device with the cover of any enclosure, or the guard or covers over any mechanism, removed.
- Due consideration should be given to any safety regulation applicable to the particular location in which the device is operating.
- Do not turn on power to the device when components are disconnected.
- The device must not be used for any purpose other than that for which it was designed and approved by Scheidt & Bachmann.
- When servicing or repairing the device, all device control panels must be tagged in compliance with OSHA Lockout/Tag out procedures to indicate that the device should not be operated.

1.5 Protective Equipment

The technician 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 carefully and follow instructions for the use of gloves when working with chemical fluids.

When using cleaning agents such as fluids or pressurized air, safety glasses must be worn to prevent eye damage.

1.6 Special Tools

There are no special tools required to ensure the safety of the service technician. However, ESD (Electrostatic Discharge: *see paragraph 1.7.8*) 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.

1.7 Use of Symbols in Manual

Symbols for cautions and warnings are used frequently throughout this manual. Each symbol appears on the left side of the page with the associated text printed to the right.

There are several different types of symbols that indicate varying levels of safety hazards. Detailed information on each symbol is provide in this chapter.

It is vital that the technician understand and follow all safety warnings, cautions and information guidelines when working on AFC Systems.

1.7.1 Warning Symbol

The Warning Symbol indicates a potential for serious damage to the equipment or serious injury to the maintenance or service technician. Extreme care should be used when performing procedures that are preceded by this symbol.



*This symbol indicates a **WARNING**. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.*

1.7.2 Caution Symbol

The Caution Symbol indicates a potential for damage to a particular part or function of the device. Reasonable care should be used when performing procedures preceded by this symbol.



*This symbol indicates a **CAUTION**. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.*

1.7.3 Information Symbol

The Information Symbol indicates special information that could be important for protecting a particular part or function of the device. Reasonable care should be used when performing procedures that are preceded by this symbol.



*This symbol indicates that more **INFORMATION** follows. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.*

1.7.4 Example Symbol

The Example Symbol precedes an example of a function. The text or illustration explains one possible function. This explanation applies to all other functions of the same kind.

*This symbol indicates that an **EXAMPLE** follows.*

1.7.5 Finger Tip Maintenance Symbol

The Finger Tip Symbol indicates that no tools are required to perform the task described. Reasonable care should be used when performing procedures that are preceded by this symbol.



*This symbol indicates a **FINGER TIP MAINTENANCE** action. A step-by-step description of the task will appear next to the symbol in bold, italic print.*

1.7.6 Tools Symbol

The Tools Symbol indicates that tools are required to perform the task described. Reasonable care should be used when performing procedures that are preceded by this symbol.



*This symbol indicates a **TOOL** is required to perform the task described in the text.*

1.7.7 Electrical Hazard Symbol

The Electrical Hazard Symbol indicates the potential for serious damage to the device caused by electrical voltage surges or serious injury to the service technician caused by electrical shock. Extreme care should be used when performing procedures preceded by this symbol.



*This symbol indicates possibility of **ELECTRICAL HAZARD**. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.*

1.7.8 Electrostatic Discharge Symbol

The Electrostatic Discharge Symbol indicates the potential for serious damage to the printed circuit boards or other Electrostatic Discharge (ESD) sensitive devices in the device. Extreme care should be used when performing procedures preceded by this symbol. The technician should wear a grounding strap and use the proper techniques associated with handling printed circuit boards or other ESD sensitive devices.



*This symbol indicates an **ESD HAZARD**. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.*

1.7.9 Hot Hazard Symbol

The Hot Hazard Symbol indicates the danger for serious burns caused by surfaces within the device that may be extremely HOT to the touch. Hot surfaces can cause serious injury to the service technician. Extreme care should be used when performing procedures preceded by this symbol.



This symbol indicates a RISK OF BURNS. A detailed description of the particular hazard will appear next to the symbol in bold, italic print.

1.7.10 Maintenance Cycle Symbol

The maintenance cycle symbol indicates the required maintenance cycles described in the subsequent part of the manual. An example is shown below. Time is indicated by month or by quantities of coins or tickets.

Preventive maintenance cycle: Every 3 months

1.8 Device Safety Labels

The typical AFC 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 device subassemblies. Not all safety labels may apply to service operations on every subassemblies.

A series of different labels is used within the device. 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.

1.8.1 Labels On the OV|41

There are several labels used on the OV|41. These labels and their meanings are described below.

1.8.1.1 Label Locations

The Labels shown in **Figure 1-1** are found inside the device as shown.

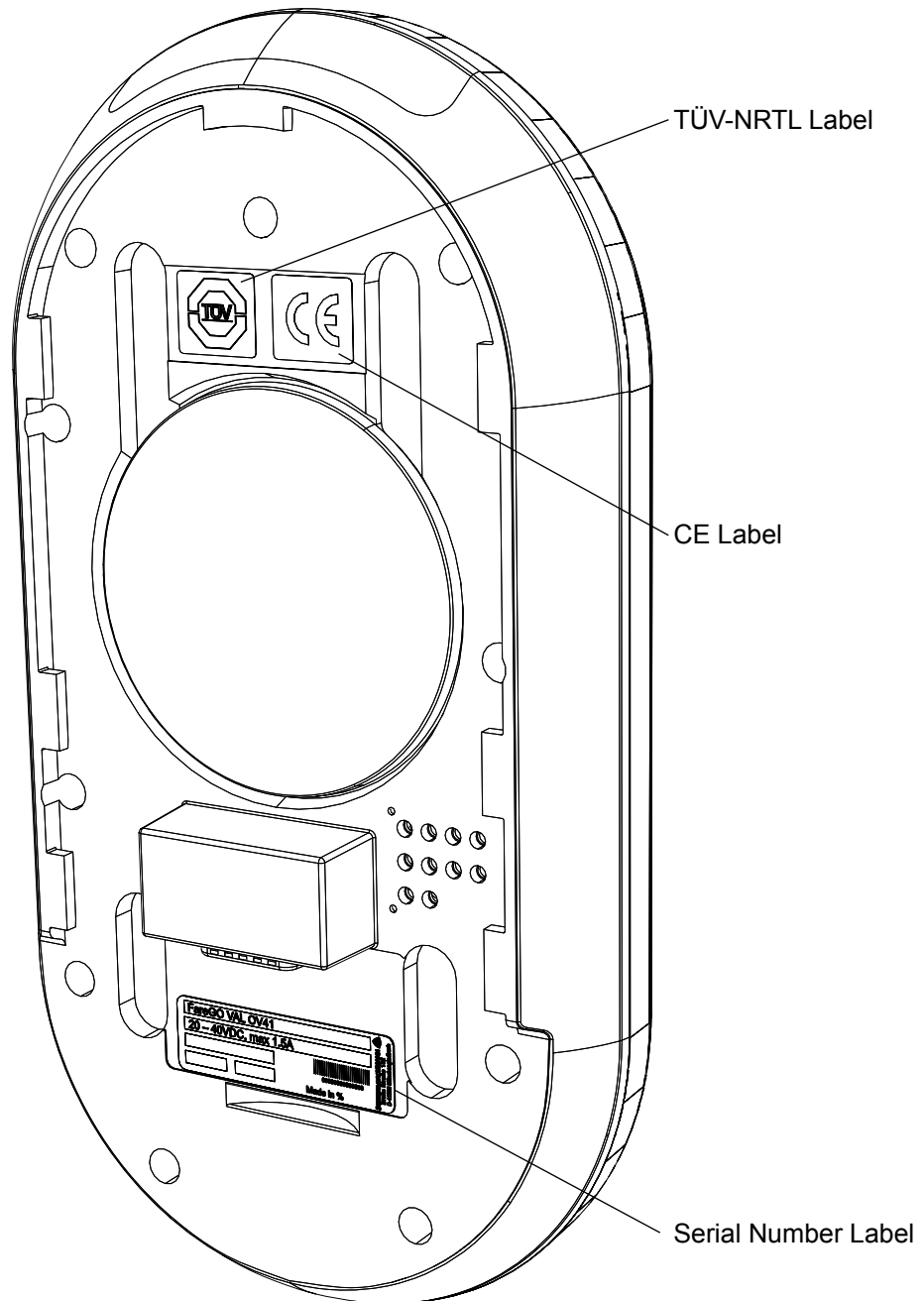


Figure 1-1 Label Locations

1.0.0.1 Type Label

The type label shown in **Figure 1-2** appears at the back of the enclosure as shown in **Figure 1-1**. This label indicates the voltage range, maximum amperes, year of manufacture, and manufacturing location as well as the name of the device and serial number.

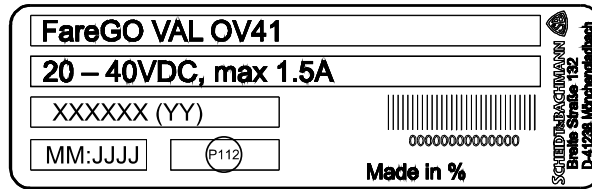


Figure 1-2 The Type Label

1.8.1.2 CE Label

The CE label shown in **Figure 1-3** appears on the backside of the device as shown in **Figure 1-1**

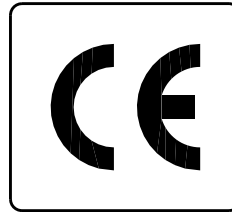


Figure 1-3CE Label

1.8.1.3 FCC License Label

The FCC License label shown in **Figure 1-4** appears on the backside of the device.

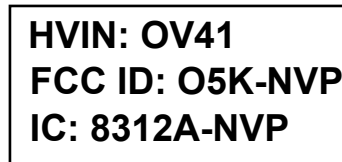


Figure 1-4FCC-License

1.8.1.4 TÜV SÜD NRTL Label

The TÜV-SÜD-NRTL label shown in **Figure 1-4** appears on the backside of the device as shown in **Figure 1-1**.

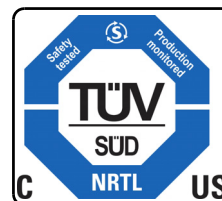


Figure 1-5FCC-License

Chapter 2 Glossary

2.1 Glossary of Terms and Abbreviations

Many terms and abbreviations are used to describe Fare Collection Equipment. Some are Automated Fare Collection (AFC) industry standard terms, some are application-specific, such as networking and telecommunications terms, and some are unique to the customer's system.

A

A	See "Ampere".
AC	See "Alternating Current".
Access Level	Individual users of a computer system have specific access rights that regulate what they can view or modify. Access rights are organized into groups, which are called Access Levels.
ADA	See "Americans with Disabilities Act".
Alarm Event	An alarm event is generally defined as the unauthorized opening of an AFC device.
Alternating Current	An electrical current that continuously changes polarity or direction of flow, usually 50 or 60 times per second
Americans with Disabilities Act (ADA)	The federal law mandating facility and equipment accessibility requirements for persons with disabilities.
Ampere	A unit of measure of electrical current, the current produced by applying one volt to a circuit with a resistance of one ohm.
ANSI	American National Standards Institute
Application Server	NT-based server which runs the Central Data Collection System Application processes
APTA	American Public Transportation Association
ASCII	American Standard Code for Information Interchange
Audio Speaker	A speaker that broadcasts messages in the language of choice with content similar to the message on the customer display.
AWG	American Wire Gauge, a measure of the cross section of a wire.

B

Barcode	A barcode is used to encrypt data into a series of vertical bars (universal product code [UPC]). It identifies various modules within an AFC device such as a ticket roll.
Barcode Scanner	The Barcode Scanner is a handheld scanner used to read barcodes (e.g. on replacement components).
Bitmap	Bit-oriented graphics
Blower	Also referred to as a “fan,” the blower cools the Central Processing Unit (CPU) in the ECU.
Boot	Loading of the operating system into the RAM
Byte	1 Byte = 8 Bit

C

Card	A credit, debit, stored value, or “smart” card
CDCS	See “Central Data Collection and Information System”.
Central Data Collection System (CDCS)	Centralized company file server that collects and distributes operating and system fare collection data. The CDCS serves all connected machines and devices.
Command	Instruction to initiate a special transaction
Command Codes	See “Service Command”.
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check. Check sum of the content of the file.
Customer Display	The Customer Display is a part of the user interface. In some devices, it may include a touch screen.
Customer Specific Value	A data field in which the customer is able to store individualized information.

D

Database	A database is an accumulation of individual pieces of information that are related to each other.
Database Server	The Database Server is the CDCS hardware and software system on which the database is located.
DC	Direct Current
DCM	Data Control Module; a flash card used to update equipment in the field.

Device Type	Device type is a term that refers to categories of AFC equipment, such as TVMs, TOMs, Fare Gates, MEMs, etc.
Distance Based Fares	Fares that vary in cost with the length of the trip.
DK	Derivation key; the derivation key is used within the data encryption process.
Download	The process of sending information from a host to a client, enabling client data to be updated.
Driver	Software interface which connects devices to the operating system.
DTE	Diagnostic and Test Equipment

E

Electrostatic Discharge (ESD)	The Electrostatic Discharge symbol indicates the potential for serious damage to the printed circuit boards or other Electrostatic Discharge (ESD) sensitive devices in the device. Grounding precautions must be followed whenever this symbol appears.
Element.h	The element.h file defines elements in service/statistic printouts.
EPF	Ethernet Power Feed; S&B power supply system
Error Codes	Also called an error message, which is generated automatically when a particular set of abnormal conditions occurs. Error information concerning a system fault or equipment malfunction can be viewed on the Customer Display, Service Terminal Display, or on a printed report.
Error Message	See "Error Code".
ESD	See "Electrostatic Discharge".
Ethernet Card	The Ethernet Card is installed in the ECU main computer. It provides a communications interface between the device and an Ethernet Local Area Network (LAN).
Event	Every action that occurs at or in the TSM is defined as event.

F

FCC Labels	Federal Communications Commission (FCC) labels that identify the license for the transponder identification system. These labels are located near each transponder, such as on the Additional Coin Magazine connection board, in the Coin Magazine Drawer and beside the Coin Vault.
File Transfer Protocol (FTP)	The Internet's file transfer protocol. FTP, which has been used for more than two decades, is a standard protocol for accessing files on servers all over the world.
Filter	A Filter selects data under special criterion.
Firmware	Computer programs and data loaded into read-only memory that cannot be modified by the computer during normal operation and that is not erased by loss of power.
Flash Card	The Flash Card is a memory storage module (PCMCIA) used for device initialization and backup storage.
FTP	See "File Transfer Protocol".
G	
GHz	GigaHertz - a unit of measure of electrical frequency equal to one thousand million (10^{12}) Hertz (cycles per second).
Graphical User Interface	The panel and components through which the customer interacts with the device.
GUI	See "Graphical User Interface".
H	
Hexadecimal	Numeric system with base 16 (figures from 0 to 15).
Hz	A unit of measure of electrical frequency, equal to one cycle per second.
I	
I/O	Abbreviation for input/output
ID	Abbreviation for "Identification Number"
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
ISDN	See "Integrated Services Digital Network".
ISO	International Standards Organization

K

KB	Kilobyte (one thousand bytes, where 1 byte equals 8 bits)
Keyboard	The keyboard is used by the user to enter data into the system.
kHz	KiloHertz – a measure of frequency equal to one thousand Hertz (cycles per second)

L

LAN	See “Local Area Network”.
Language Marker	Displays the language the device is equipped with.
LCD	Liquid Crystal Display; see “LCD Display” .
LED	Light Emitting Diode
LLRC	See “Lowest Level Replaceable Component”.
LLRU	See “Lowest Level Replaceable Unit”.
Lmk Check Value	The Lmk Check Value images the check sum of the host security module internal data.
Local Area Network (LAN)	A group of interconnected computers located within the same physical or geographical area (e.g. within the same building or campus.) See <i>Wide Area Network</i> .
Login	To get access the system, a login with ID and password has to be completed.
Lowest Level Replaceable Component (LLRC)	The most basic component that is normally replaced in the field
Lowest Level Replaceable Unit (LLRU)	The most basic unit or assembly that is normally replaced in the field

M

mA	Milliampere – a unit of measure of electrical current equal to one thousandth of an ampere. An ampere is the current that flows through a circuit of 1 ohm resistance with a voltage of 1 Volt applied.
MAC	Abbreviation for Message Authentication Codes.

mAh	An mAh is a milliampere-hour. It is one thousandth of an ampere-hour and is commonly used as a measure of charge in batteries. An ampere-hour is the amount of energy charge in a battery that will allow one ampere of current to flow for one hour. The HCR battery is rated at 1200 mAh.
Main Circuit Breaker	The Main Circuit Breaker, which is located in the Power Connection Box, protects the system against high current overload.
Main Module	Main Application which controls the Central Server Application.
Maintenance	The action performed to prevent equipment performance degradation or failure (preventive maintenance) or restore the device to an in-service condition following a failure (corrective maintenance).
MB	Megabyte – one million bytes, where one byte equals 8 bits.
Mbps	Megabits per second – one million bits per second
MDT	Abbreviation for Mobile Data Transporter.
MSHA	Mine Safety and Health Administration
Multimedia	Multimedia includes texts, pictures and audio data.

N

NEMA	National Electrical Manufacturers Association
Noise	Extraneous or interfering signals present on a system caused by undesirable voltages or currents.
NRTL	National Registered Test Laboratory
NWC	Abbreviation for Network Controller

O

Occupational Safety and Health Administration (OSHA)	The United States Government regulatory and oversight agency responsible for safety in the workplace.
ODBC	Open Data Base Connectivity
OEM	Original Equipment Manufacturer
Oersted [Oe]	1 Oersted = 2.021268 Ampere per inch

Online/Offline	If the TSM is connected to the Network, the network state of the TSM is online, if the TSM is disconnected, the state is offline.
Oracle	Manufacturer of database software.
OSHA	See "Occupational Safety and Health Administration".

P

Packet	A unit of data routed between an origin and a destination on any packet switching network. These "chunks" of data are an efficient size for routing.
Pass	A magnetically encoded document that provides access to designated portions of the system for a specified time period.
Password	Every user has his own individual, classified password that provides access to equipment.
Path	The path describes the location of a data file.
PC	Personal Computer – a mass-market class of computer.
PCB	Printed Circuit Board
PDU	See "Portable Data Unit".
Permit	A fare media element issued to a specific person that identifies that person as authorized for a reduced fare or adjustment. It is presented when the person purchases a ticket or pays for a ride.
PIN	Personal Identification Number.
Polling	Data transmission initiated by inquiry.
Portable Data Unit	A device used to extract data from a farebox for uploading to the Garage Computer System.
Powerfail Control	A possible power failure is monitored by the system
Primary Key	Unique number (index) for a row in the database
Process System Interface	The Process System Interface (PSI) is a software process that both controls a hardware component and interprets its state. This process is specific to each hardware component. The PSI, which is responsible for communication between separate software modules, operates independently of the operating system.
PROM	Programmable Read-Only Memory

PSI	See "Process System Interface".
PSI number	Address number of the device
Psiboot.bat	Helpfile that starts different processes.
Q	
QA/QC	Quality Assurance/Quality Control

R

RAM	Random Access Memory
RF	Radio Frequency – a high frequency electrical signal
RGB	Video display color standard (Red, Green, Blue)
ROM	Read-Only Memory
RR	Abbreviation for railroad
RTTE	Radio and Telecommunications Terminal Equipment Directive = RL 1999/EG) label identifies the radio license which is used for the transponder reading transactions. The label is located on the ACM (Additional Coin Magazine) connection board.

S

S&B	Scheidt & Bachmann
SCR	See “Smart Card Reader”.
Service Command	The Service Commands are entered into the service terminal to initiate actions (e.g. prints error codes, test tickets).
Service Text	Service Text appears on the display inside of the device (TVM) or on the agent display (TOM).
Smart Card Reader	A device that reads the encoded value stored on a smart card.
Speaker	See “Audio Speaker”.
Stored Value Card	A magnetically encoded ticket or smart card with a specified dollar value that provides access to designated portions of the system. The value on the card is reduced with each use.
System	Devices that are integrated to perform a specific function, such as the Coin Processing System, Bank Note System, and so on.

T

TCP/IP	Transmission Control Protocol/Internet Protocol. The TCP is a reliable, connection-oriented protocol that delivers, with virtually no error, a byte stream originating on one device to another device anywhere on the Internet. The IP facilitates this transfer of data by placing the bytes into packets that are easily transmitted.
Ticket	A magnetically encoded plastic or paper document used for entrance to the system and for verification of payment. In general, this term refers to the physical media, which can be encoded as a stored value card or a time based pass.
Ticket Validator	A Ticket Validator is a complete, replaceable module designed to verify the authenticity of a properly inserted magnetic ticket. Paper tickets without magnetic strips may not be validated. The printing components of a Ticket Validator interface with the CDCS through an device.
Touch Controller	Monitors the device Customer Display touch screen panel. Reports the results of data input (screen touches) to the Application Software. (Applies only to systems equipped with Touch Screen devices.)
Touch Screen	A Touch Screen is the component part of the Customer/Agent Display that detects user input by sensing a touch (or tap) on specific areas of a surface wave-sensitive touch panel.
Transponder	The Transponder Chip stores the individual ID-numbers of the Money Modules.
Transponder Reader	The Transponder Reader is located in such a way that it will read and/or recognize the chip only when the corresponding money module is correctly positioned.

U

UNIX	Operating System.
Upload	The process of sending data from the Client to the Host Computer.
Username	Every individual has a unique username that identifies that person within the system.

V

VAC	Volts Alternating Current
Variableelement.vel	Fixes the organization and the position of the components of the freetext record.

VDC	Volts Direct Current
Version	Group of data downloaded to the devices.
VGA	Abbreviation for video graphics array
VGA Controller	The VGA Controller, located in the ECU Main Computer, provides the synchronization and control signals required to generate the video for the color VGA Customer Display.

W

WAN	See "Wide Area Network".
Watchdog Timer	The Watchdog Timer monitors the ECU CPU. Should the CPU fall into a "dead" processor loop, the Watchdog Timer instructs the CPU to re-initialize the ECU and to reboot.
WAV-File	File containing audio data.
Wide Area Network (WAN)	Spanning a country or continent, a Wide Area Network is a communication network that serves geographically separated areas and locations.
Workstation	PC within a network serving as a control, input, or monitoring device.

Z

THIS PAGE INTENTIONALLY BLANK.

Chapter 3 Declaration of Conformity

3.1 Europe

The device complies to the European Directive RED 2014/53/EU

The OV41 use the following radio frequencies in Europe

Characteristic	Specification
Radio frequency:	2400 - 2483.5 MHz
Transmission power:	49 mW
radio frequency:	5150-5775 MHz
Transmission power:	45 mW
radio frequency:	13.56 MHz
Transmission power:	1.18 μ W

Table 3-2 Operating Characteristics

3.2 USA/ CANADA

NOTICE:

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

Operation is subject to the following two conditions:

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

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:

(1) l'appareil ne doit pas produire de brouillage, et

(2) 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 licence-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.

NOTE: 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 4 Troubleshooting and Module Removal

4.1 Troubleshooting Overview

This chapter provides information about OV|41 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 OV|41 to service. When service cannot be restored, the module needs to be replaced with an operational one.

To reiterate what is said in the preceding paragraph, a maintenance technician should troubleshoot OV|41 errors by:

- Making sure the OV|41 can power on.
- Making sure the correct software versions are on the OV|41.

4.1.1 Out of Service

Shown in **Figure 4-6**, the 'Out of Service' screen is displayed when the OV|41 is in 'Out of Service' mode. The device will not read or write to any Farecards.



Figure 4-6 'Out of Service' Screen

When a critical alarm is detected, the OV|41 switches to Out-of-Service mode. Possible causes include:

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

The solution is to remove and replace the OV|41. If the failure persists, contacting the Helpdesk is the appropriate action.

4.2 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** (**Figure 4-7**). Errors interrupt one type of fare transaction.

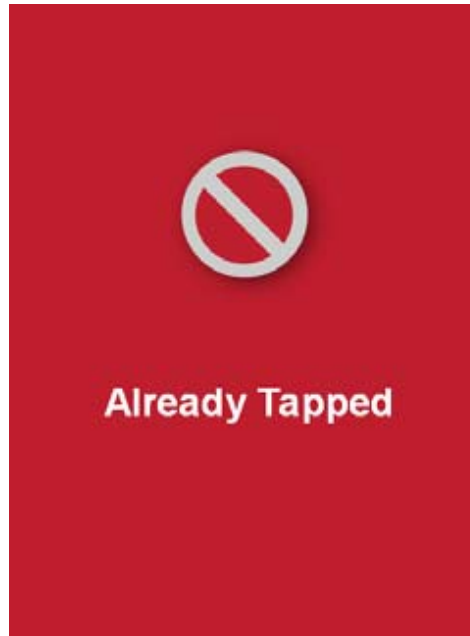


Figure 4-7 Already Tapped

4.0.1 Cash Supplement Required

A cardholder may invoke the screen shown in **Figure 4-8** under four sets of circumstances. These are:

- Tapping a Farecard with a Period Pass where Cash Supplement is required,
- Tapping an STO card with a valid Period Pass where a Cash Supplement is required,
- Tapping a Farecard with a Transfer Product where Cash Supplement is required, or
- Tapping an STO card with a Transfer Product where Cash Supplement is required.

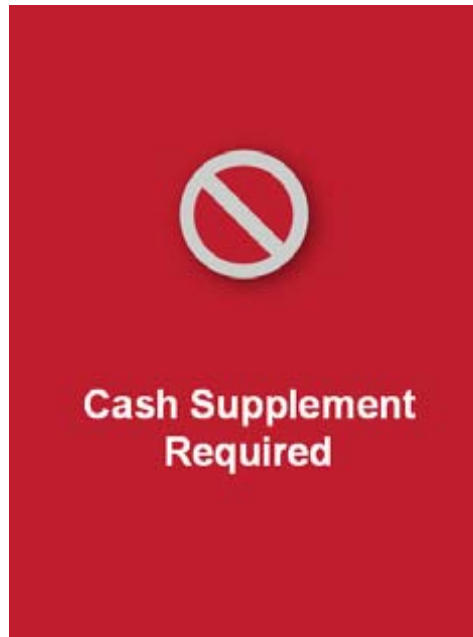


Figure 4-8 Cash Supplement

4.0.2 Cash Fare Required

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

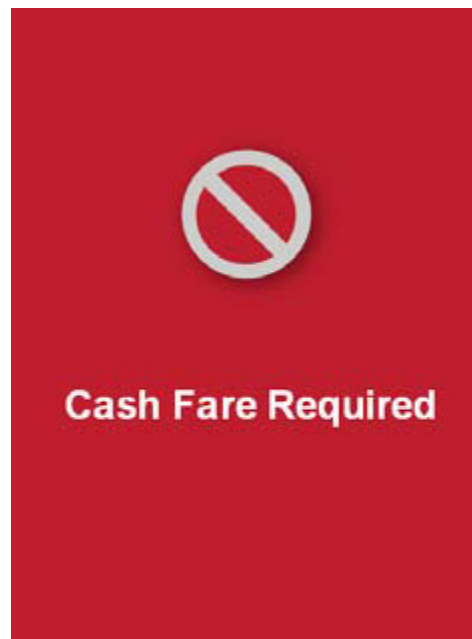


Figure 4-9 Cash Fare Required

4.0.3 Not Enough Funds, Reload Required

There are three circumstances when a cardholder may invoke the screen shown in **Figure 4-10**. These are:

- Tapping a registered Farecard with a negative e-Purse,
- Tapping an anonymous Farecard with a zero e-Purse,
- Tapping an anonymous Farecard with a positive e-Purse that is less than the fare.

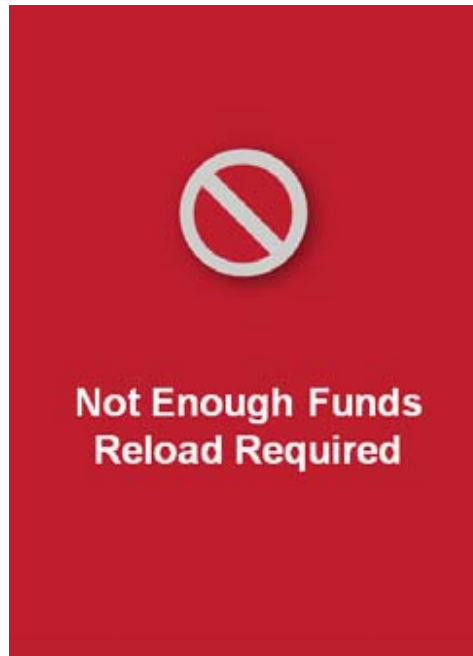


Figure 4-10 Funds Lacking

4.0.4 Card Read Error

A card read error will cause the screen shown in **Figure 4-11** to appear.

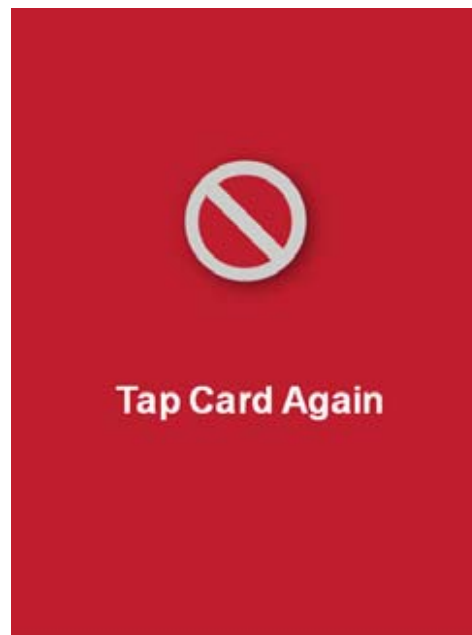


Figure 4-11 Farecard Read Error

4.1 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**.

4.2.1 Blocked Card

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

- Blocked Farecard,
- A Farecard that has not been activated, or
- A card read/write error.

When a cardholder taps a blocked Farecard, a blocked card, a Hotlisted Farecard, or a Hotlisted STO card on the OV41, the screen in **Figure 4-12** appears.

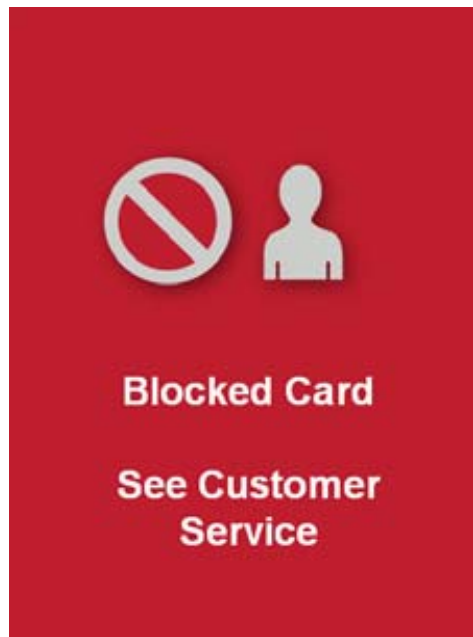


Figure 4-12 Blocked Card

4.1.1 Card Inactive When a cardholder taps a not activated Farecard on the OV|41, the screen shown in **Figure 4-13** appears.

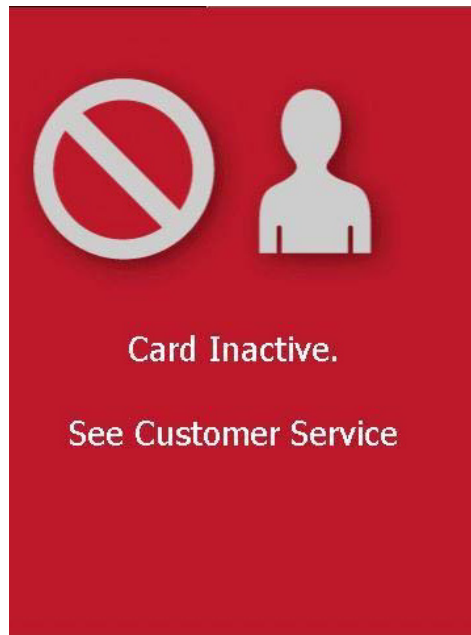


Figure 4-13 Card Inactive

4.2.2 Card Error When a cardholder taps an invalid WMATA Farecard, the screen in **Figure 4-14** appears.

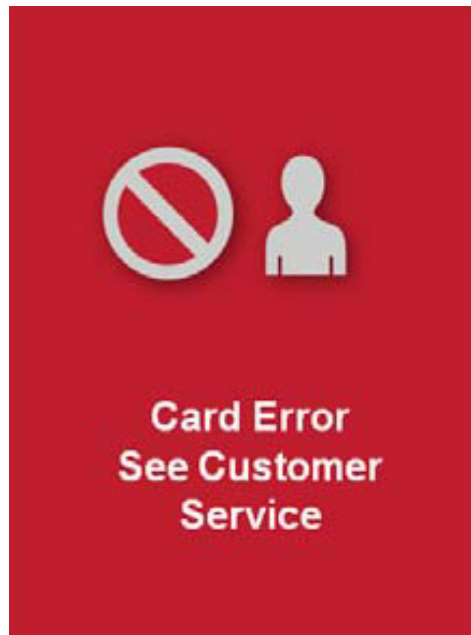


Figure 4-14 Card Error

4.1.2 Reversal Not Possible

When a cardholder tries to reverse a fare payment via the OV|41 where fare reversal is not processed, the screen in **Figure 4-15** appears.

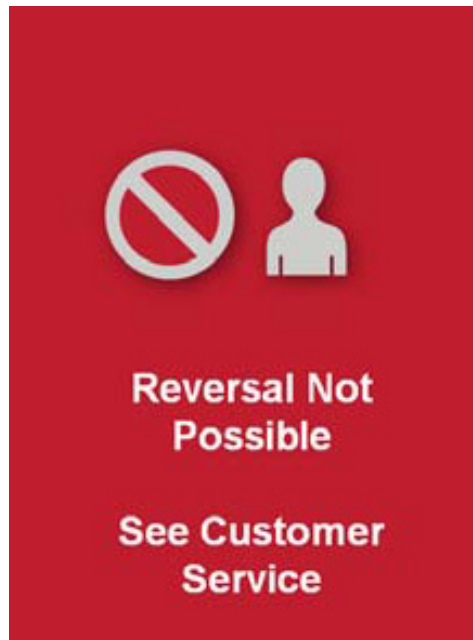


Figure 4-15 Reversal Error

4.2 Module Removal - Base Unit

The drawing in **Figure 4-16** illustrates how to unlock the OV|41 Base Unit and remove it for field replacement.

STEP 1: Use the key to unlock the device.

STEP 2: Push the Base Unit so far upward, that the OV|41 can take away from the mounting unit.



At no time should the service provider open the device to troubleshoot, repair, or replace OV|41 components in the field.

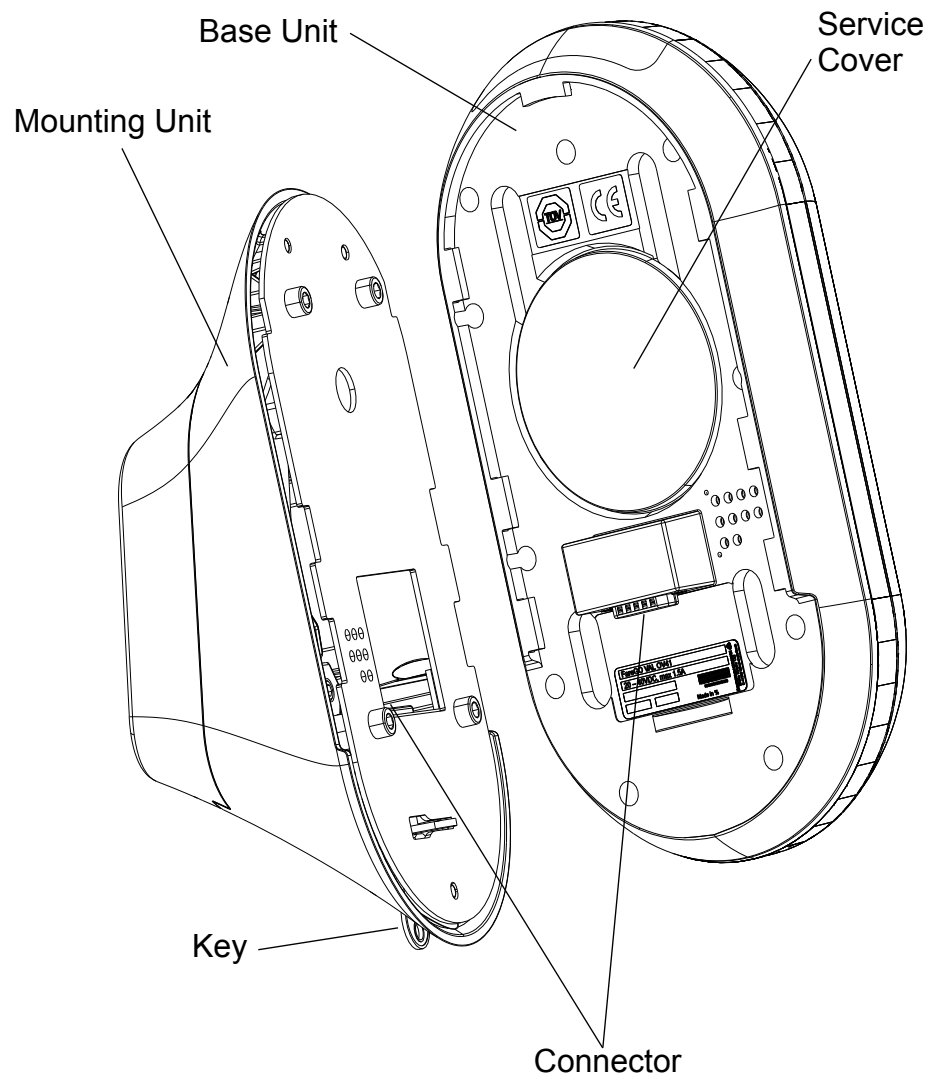


Figure 4-16 Module Removal - Base Unit

NOTE:

As a backup to the online data transmission, a second, pre-configured Micro SD card may be inserted into the OV|41 (different from the backup module Micro SD-card). This second, pre-configured card may be used if the OV|41 is not online or cannot connect to the back end. Transaction data is also stored in the non-volatile system memory (flash memory).

- STEP 3:** Open the service cover.
- STEP 4:** Remove the Backup microSD Card as shown in **Figure 4-17**.
- STEP 5:** Insert the MicroSD Card in the replacement OV|41.
- STEP 6:** Set the base unit on the mounting unit and push it down.
- STEP 7:** Lock the base unit by turning the key showing in **Figure 4-16**.

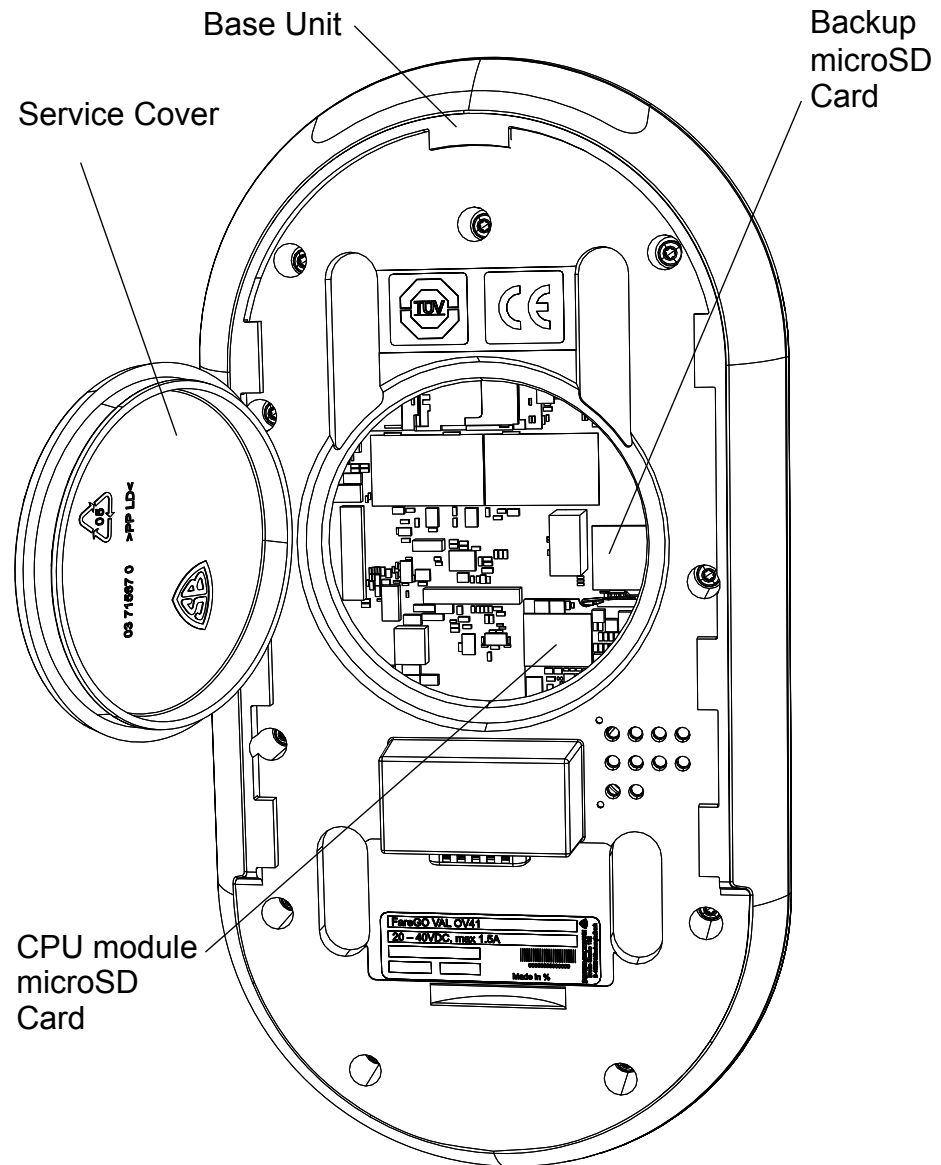


Figure 4-17 Service Cover - open

4.3 Module Removal - Mounting Unit

The drawing in **Figure 4-18** illustrates how to remove the OV|41 mounting unit from the mounting bar.

- STEP 1:** Remove the base unit from the mounting unit as shown in Chapter 4.2.
- STEP 2:** Cut the cable tie and remove the power/network cable as shown in **Figure 4-19**.
- STEP 3:** Remove the four screws which fix the mounting plate to the mounting unit front part and remove the mounting plate.
- STEP 4:** Remove the four screws which fix the mounting unit rear part to the mounting unit front part and remove the mounting unit parts from the mounting bar.



Be careful when removing the mounting unit front part. When you push the Front part up or down you can damage the Power/network cable.

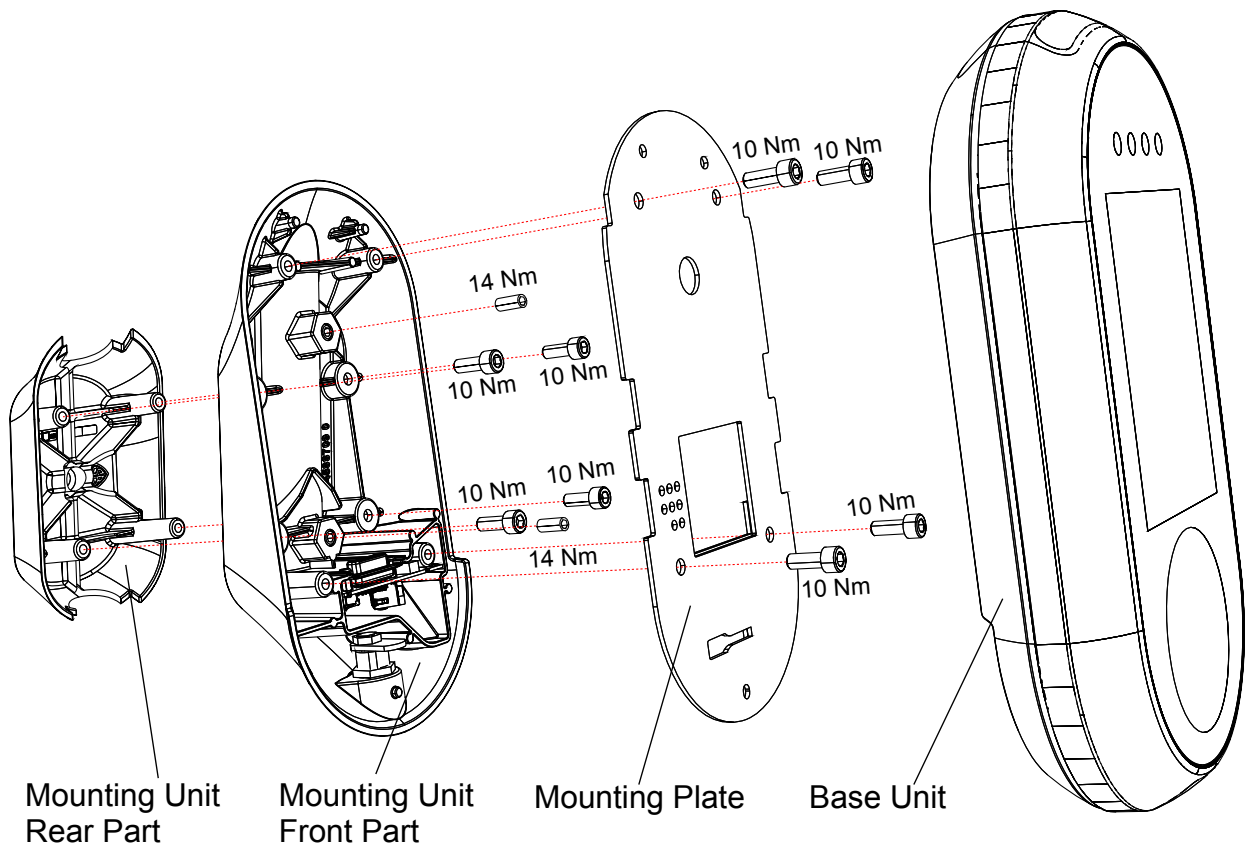


Figure 4-18 Module Removal - Mounting Unit

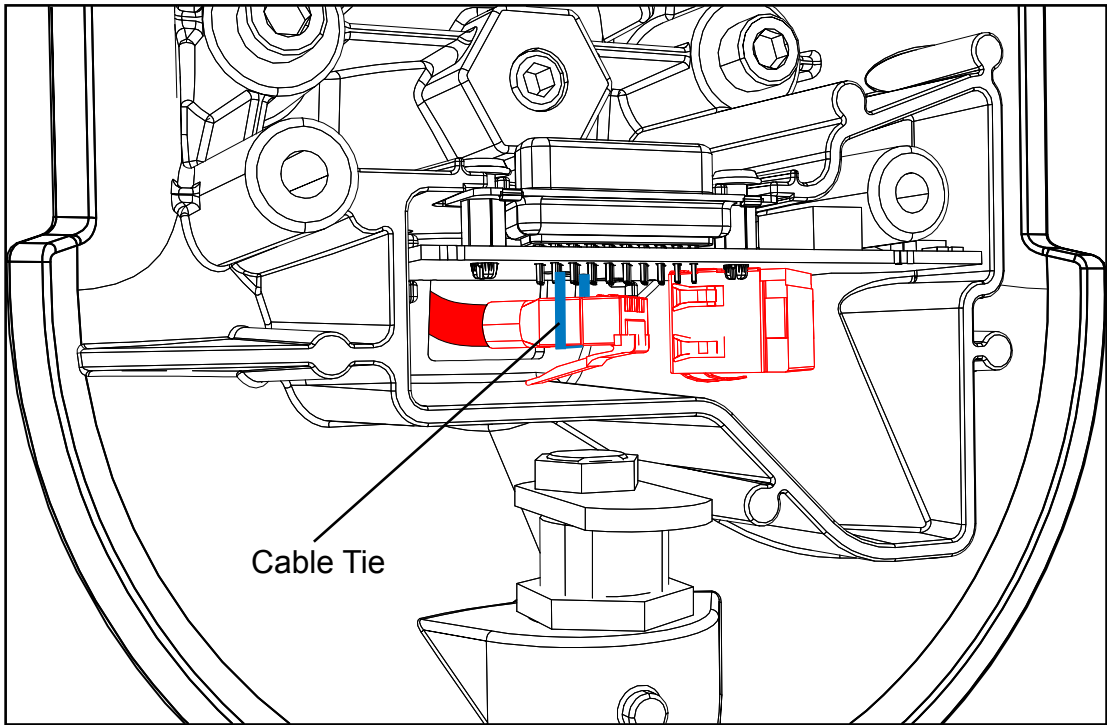


Figure 4-19 Wiring Connections

- STEP 5:** Place a new OV|41 mounting unit near the proper mounting position and connect the power/network cable as shown in **Figure 4-19**.
- STEP 6:** Secure the plug to the circuit board by a cable tie
- STEP 7:** Put the OV|41 in the proper mounting position on the mounting post as shown in **Figure 4-20**.

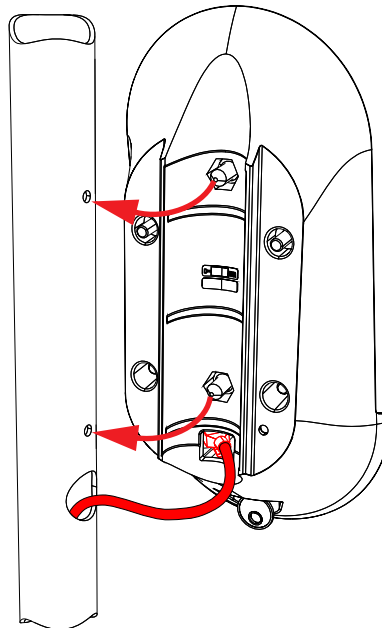


Figure 4-20 Wiring Connections

- STEP 8:** Set the mounting unit rear part on the mounting unit front part and fix it with the four screws shown in **Figure 4-18**
- STEP 9:** Set the mounting plate on the mounting unit front part and fix it with the four screws shown in **Figure 4-18**
- STEP 10:** Install the base unit as shown in Chapter 4.2.

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

NOTE:

The back-up module holds the last shift data and the device ID only.

No configuration is needed for creation of the device back-up module. Use an empty micro SD card, insert in the slot, power on the device. The device will recognize the empty micro SD card and will initialize it automatically. If the device detects a non-empty micro SD card, the device will reject the micro SD card and remain out of service. The device initialization through the back-up module will be completed with a synchronization through IVN. Spare back-up modules (micro SD cards) will be provided with each spare device. The service provider is responsible for providing additional spare back-up modules

If the device is faulty, transfer the faulty device's back-up module to the new replacement device. There will be no loss of device data. Avoid using an empty back-up card. Only use an empty card during a device swap if the original back up module is lost, defective, or the entire device/back-up combination is not available. Maintenance staff should be careful not to damage or lose back-up modules when swapping faulty devices, because all backed up data will be lost. Users may determine if a device back-up module is faulty by checking the Back-end system.

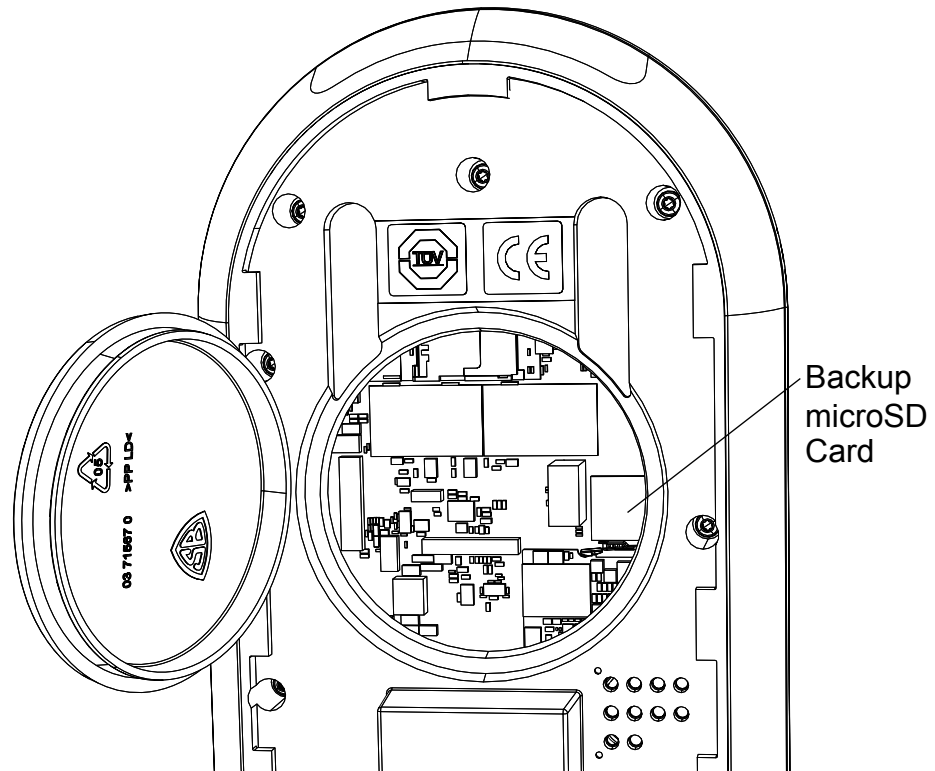


Figure 4-21 MicroSD Card

4.2.3 Recovery Scenarios

If the OV|41 is faulty and the Back-up MicroSD card is still intact, follow Recovery Scenario 1. If the MicroSD card is lost, damaged, or defective but the OV|41 is functional, follow Recovery Scenario 2. If both the OV|41 and the Backup MicroSD card are damaged (a double failure), follow Recovery Scenario 3.

4.2.3.1 Recovery Scenario 1

When the OV|41 is faulty and the Backup MicroSD Card is still intact, follow these steps.

- STEP 1:** Remove faulty OV|41 from the bus (unplug data (Cat-6 cable) and power – remove from the pole).
- STEP 2:** Remove the Backup MicroSD card from the malfunctioning OV|41 (spring loaded, pressing it down will pop it up for removal). It is a small module; be careful handling it.
- STEP 3:** Install new OV|41 on the bus (following the standard installation process).
- STEP 4:** Insert the working MicroSD Backup card (from faulty OV|41) into the new OV|41 (left slot).
- STEP 5:** Turn on the OV|41 (hook up data and power cables and re-attach to pole).
- STEP 6:** OV|41 goes through a recovery process (configures IP, data, transactions, etc.).
- STEP 7:** OV|41 will reboot after the recovery process. At this point the device is identical to the failed one.
- STEP 8:** Turn on the device and sync to Backend system (to receive updated lists / version data) – confirm that the OV|41 is operational and communicating online.
- STEP 9:** DATA STATUS: NO data loss.

4.2.3.2 Recovery Scenario 2

If the MicroSD card is lost, damaged, or defective but the OV|41 is functional, follow these steps.

STEP 1: Open the OV|41 cover. If necessary, remove the faulty backup module.

STEP 2: Insert a formatted new MicroSD-Card. 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: DATA STATUS: NO data loss - All transaction data will be retrieved from the working OV|41 and uploaded to the Backend system.

If Manual Data Recovery must be attempted, follow these steps.

STEP 1: Create a Service Modul to execute the Service Command automatically on the Device. This may be created on Backend system in Offline Modul processing.

Initialize offline data carrier

Message

Select drive: G:\

Using purpose

Offline data carrier

Backup module

Basic data

Type: 11 - Service Module (execution of service commands)

Number: 00000001 System-ID: 00004711

Company name: Presto PIN: 00004711

Used for: 1 - official Service Command: 66

Device type: TVM

Using text:

Initialize offline data carrier Exit

Figure 4-22 Initialize Offline Data Carrier

STEP 2: The Procedure on the Device is the same as in Recovery Scenario 1.

4.3.0.1 Recovery Scenario 3 If both the OV|41 and the Backup MicroSD Card are damaged (a double failure), follow these steps.

- STEP 1:** Remove the damaged OV|41 from the bus; it needs to be replaced.
- STEP 2:** Send OV|41 (along with its MicroSD backup module) to Central Repair Depot to attempt retrieval of the shift files (data recovery may not be possible depending on the extent of the damage).
- STEP 3:** Install a new OV|41 on the bus.
- STEP 4:** Insert new Backup SD card which has the file Backupmodule.ini with the correct ID setting (this number will be the same as the one on the original backup module, and can also be seen under Extended Parameters in Device Maintenance). The OV|41 will configure itself and use the SD card as the backup module when it is powered on.
- STEP 5:** DATA STATUS: Possible Loss. The transaction data generated since the last IVN sync is at risk of being permanently lost in the case of the dual failures of both the OV|41 and Backup module. If the main logic board of the OV|41 is intact, or if the SD card can still be read, then data recovery at the Central Repair Depot may be possible.

Please note: The format for the ID number in the Backupmodule.INI file is as follows:

AABBBBBBCC, where AA is the provider number (12 for WMATA), BBBBBB is the 6 digit device ID (such as 020001), and CC is the position in the bus of the OV|41 (02, 03, or 04). 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=129999902
Operator ID 12
Busnumber 999999
OV|41 1.
```

4.3 Verifying Software Versions

As a troubleshooting step, a maintenance technician may verify the device software versions with the expected version. If the versions are different, the technician should request that the Backend system Operator confirm that the new software versions are linked to the device. If so, attempt the device software download through the Backend system maintenance of jobs.

4.4 Tools and Consumables

There are no consumables for this device. The only tool is a unique key used to open and close the device.

Name	Part Number
OV 41 Base Unit	00 XXXXX
	03 XXXXX
	03 XXXXX

Table 4-3 Part Numbers

Chapter 5 Preventive Maintenance

5.1 General Maintenance and Cleaning

The following general preventive maintenance procedures are for the overall maintenance and cleaning of the OV|41. This includes testing and validating the equipment to ensure proper operation. During this Preventive Maintenance process, notify the Network Control Administrator that alarms may be triggered.



Unless otherwise specified, the power must be turned “Off” prior to performing maintenance procedures.

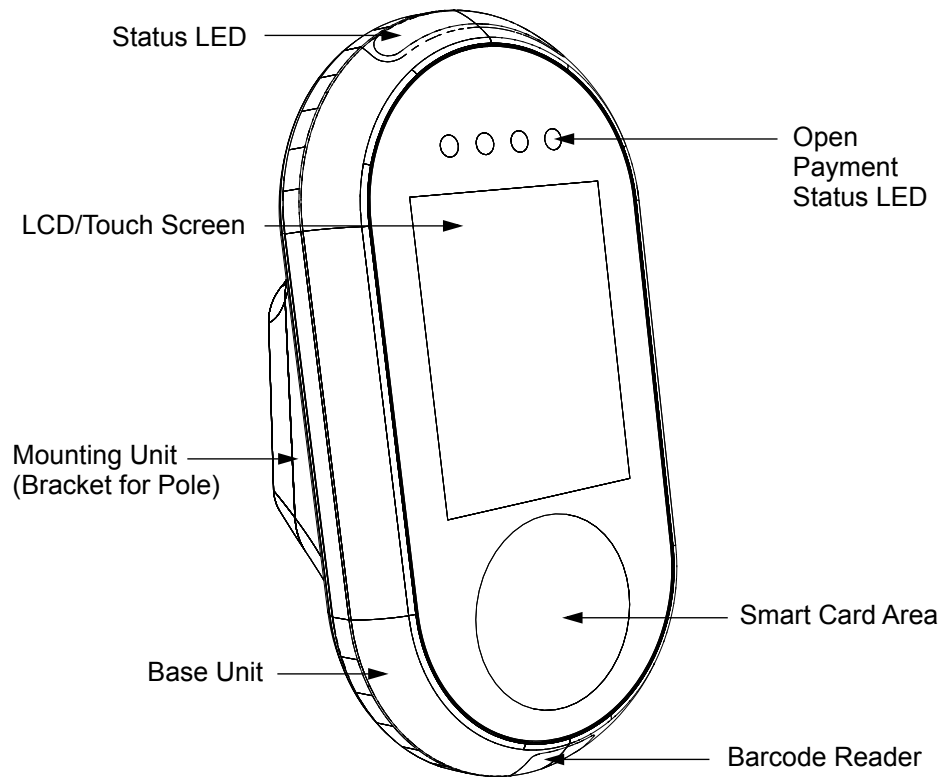


Figure 5-23 OV|41

5.2 Preventive Maintenance Schedule Summary



The following table is a single source that summarizes all of the preventative maintenance procedures mentioned in this chapter. Use this table to determine what procedures that need to be accomplished, and when they should be scheduled.

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.

Table 5-4 Recommended Preventive Maintenance Schedule/Frequency

FREQUENCY	DESCRIPTION
Every Month	Cleaning and Visual Inspection of the Exterior
	Screen Preventive Maintenance
	Smart Card Antenna
	Lock Preventive Maintenance
Every Three Months	Cleaning and Visual Inspection of the Interior

5.3 Materials and Replacement Parts

Table 13-2 provides a complete list of the materials and replacement parts needed to perform corrective maintenance on the OV|41.

ITEM	PART NUMBER	WHERE USED
Canned Air		General Use
Alcohol	Isopropyl, (70% min.)	General Use
Lexan Cleaner	Windex (or other mild)	Customer Display
Heavy Duty Shop Cloths	Lint-free, soft	Miscellaneous Use

Table 5-5 Materials and Replacement Parts

Chapter 6 OV|41 Installation

6.1 Overview

The OV|41 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 OV|41 Initialization instructions.

The following information and instructions are provided for the installer of a OV|41.

- To avoid damage, deliver OV|41 equipment to the installation location in the original packaging and Scheidt & Bachmann wrapping.
- The OV|41 device is installed inside bus vehicles and provides Farecard validation.



The OV|41 equipment is fragile. Handle with extreme care. Do not drop!

6.2 Hardware

The OV|41 assembly is composed of two main parts:

- The OV|41 Base Unit
- The Mounting Unit

The Mounting Unit is mechanically fixed onto a pole internally on the bus. The Mounting Unit supports the OV|41. The OV|41 base unit is securely fixed to the Mounting Unit.

The internal components of the device are covered by the front and the rear covers which protect them against vandalism and water. Both covers are screwed together so that unauthorized access to inner components from outside is not possible.

6.3 Dimension and Weight

The dimensions of the OV|41 are in **Table 6-6**.

	Height	Width	Depth
Base Unit	295 mm	155 mm	56 mm
Base Unit incl. Mounting Unit	295 mm	155 mm	148 mm

Table 6-6Dimensions

The weight of the OV|41 is approximately 4 kg.

6.4 Power Requirements

The power/network connector of the OV|41 is located in the mounting unit and has a full operating range from 20 VDC to 40 VDC.

Use only S&B EPF systems as power source and CAT6 SFTP cable as wiring.

In standby mode, the OV|41 uses 8 W. In operational mode, the OV|41 uses 12 W.



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

Mode		Power Consumption
Standby	OV 41 ready to accept Smart Card	8 W
Operational	Farecard processing and audio	12 W
NOTE: Use only S&B EPF systems as power source and CAT6 SFTP cable as wiring		

Table 6-7 Power Consumption

Power supply

Article No.	Description
0377252	OV41 Power Box cpl. without CPD

Table 6-8 Power Supply

(

6.4 Network Requirements

A NRTL listed, flexible Cat 6 cable will provide data communication and power supply. The cable complies with NFPA70 and NEC including Chapter 800. The Ethernet Connector is a standard RJ45.

Figure 6-24 Block Diagram OV|41

6.5 Operating Features

OV|41 operating characteristics are shown in **Table 6-9**.

Characteristic	Specification
Operating Humidity	10% to 95%, non-condensing
Operating Temperature	-30 °C to +50 °C
Power Supply	Nominal 24VDC (20VDC to 40VDC)
Power Consumption	12 Watts maximum, 8 Watts standby
Use CAT6 SFTP cable as wiring.	

Table 6-9 Operating Characteristics

6.5.1 OV|41 Mounting and Environmental Considerations

During transportation and when OV|41 equipment is installed but not operational, the environmental and storage conditions of **Table 6-10** must be met. The requirements for OV|41 equipment mounting must also be met. Observing these requirements is the responsibility of the Transit Authority, its architect, and installers. Minimum clearances, minimum distances from obstructions, placement in a convenient location, and the comfort of the operator are all considerations that should be foremost in the minds of those planning the installation. The OV|41 should be operated only when “office environmental conditions” exist in the workplace.

Environmental Condition	Acceptable Range
Temperature Range	-40 °C to +70 °C
Humidity	10% to 95%, non-condensing

Table 6-10 Non-Operational Environmental Conditions



Non-operational environmental and storage conditions must be observed! Non-operational environmental and storage conditions apply when the OV|41 is installed but not operational. During operation “Office Environmental Conditions” must be provided.

6.6 Installation Requirements

The following materials, standard tools, and preconditions are required for OV|41 installation.

6.6.1 Materials

At a minimum, the following materials will be included in the OV|41 package:

- 1 x Fully Assembled Functional OV|41 unit

6.6.2 Standard Tools

Below is a list of required tools and materials:

- Small wrench with bit holder
- Cable Cutter
- Drill
- Spiral Drills
- Edge Trim for the cable opening
- Measuring Tape, minimum 2 meter length

6.6.3 Special Tools

- Drilling Aid

6.7 Needs and Requirements for OV|41 Installation

The following preconditions must be met by installer before installing the OV|41 (OV|41). The installer must check the following items:

- Is there enough space available for the OV|41?
- Are all installation components present?
- Is a regular metric tool set available? A 174 piece SAE/Metric tool set with 4 drive tools, 10 wrenches, and 121 additional tools, similar to the Alltrade 320329 Tool Set with Tool Box, should have all the necessary tools to make any adjustments, connections, or installations required.
- Is an Ethernet/Power cable with an RJ 45 plug available?
- Are a pencil and pad of paper available for note taking, such as noting IP addresses, and check list verification?
- Is the unique key available?



Ensure there is no other cabling in the bus framework that may be damaged by the installation.



Before starting installation, ensure there is no power on any cable, breakers are shut off, and all data cabling is disconnected.

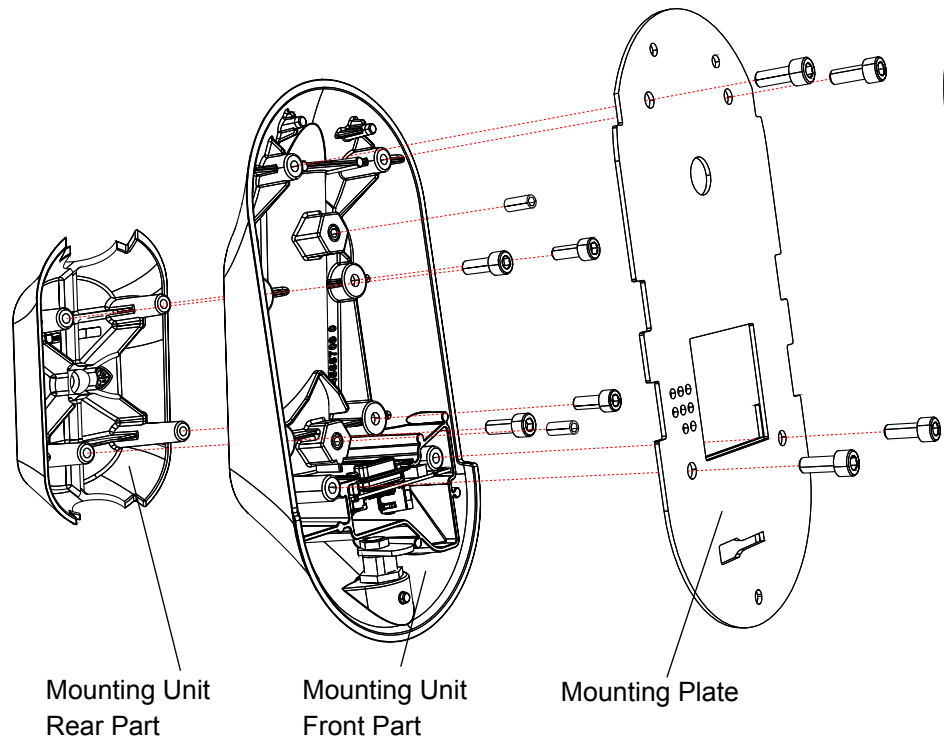


Figure 6-25 OV|41 Mounting Unit

6.8 Installation

This section gives details related to the mechanical mounting of the OV|41. A Mounting Unit will be attached to the bus framework. The chosen location is to be agreed upon between the installation subcontractor and the customer.

The mounting unit of the OV|41 consists of two parts that are mounted together with four screws (**Figure 6-25**). The base unit covers all the electrical components. Two fix studs in the front part of the mounting unit will avoid twisting the OV|41 around the pole. The OV|41 base unit will be secured by a lock under the mounting unit.

Follow these steps to attach a OV|41.

STEP 1: Mark the upper edge of the OV|41 on the pole. (See **Figure 6-26**)

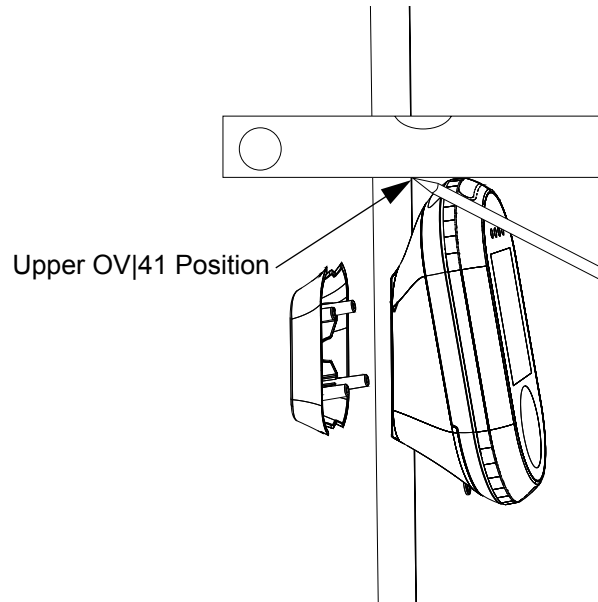


Figure 6-26 Marking Upper OV|41 Position

STEP 2: Clamp the drilling aid on the pole. The top hole of the drilling aid is located 97 mm from the upper edge of the validator.

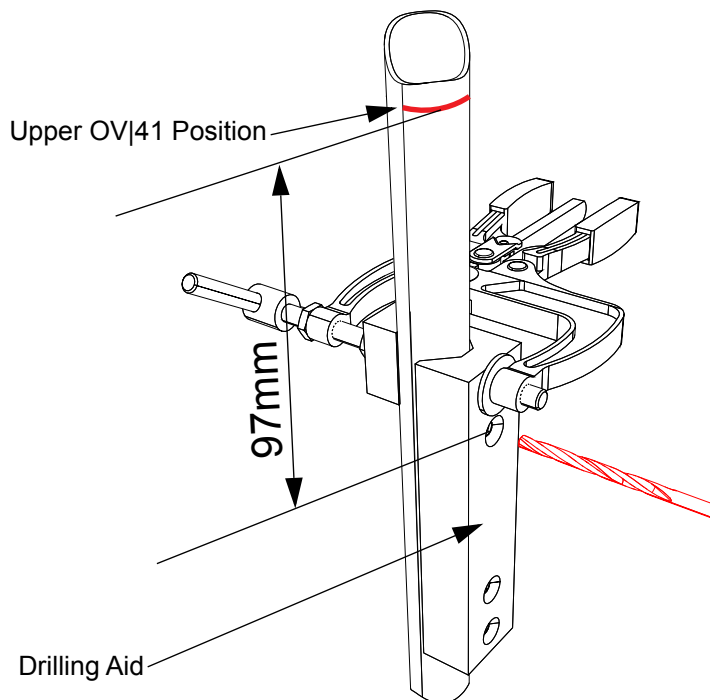


Figure 6-27 Marking Upper OV|41 Position

STEP 3: Drill the 5 mm holes for the studs and the cut out for the cable into the pole (see **Figure 6-27** and **Figure 6-28**).

STEP 4: Expand the 5 mm hole for the cable opening (middle hole) as needed for the existing cable with a appropriated drill.

STEP 5: De-burr all boreholes.



***Wear safety glasses when drilling for eye protection!
Grip the drill firmly. If it sticks, it can twist in your hands and cause serious injury!***

STEP 6: Use a trim along the sharp edges of the cable cut out to protect the wiring. This edge trim must comply with TÜV-SÜD-NRTL R/C QMFZ2 Plastics with a minimum Flame class HB.

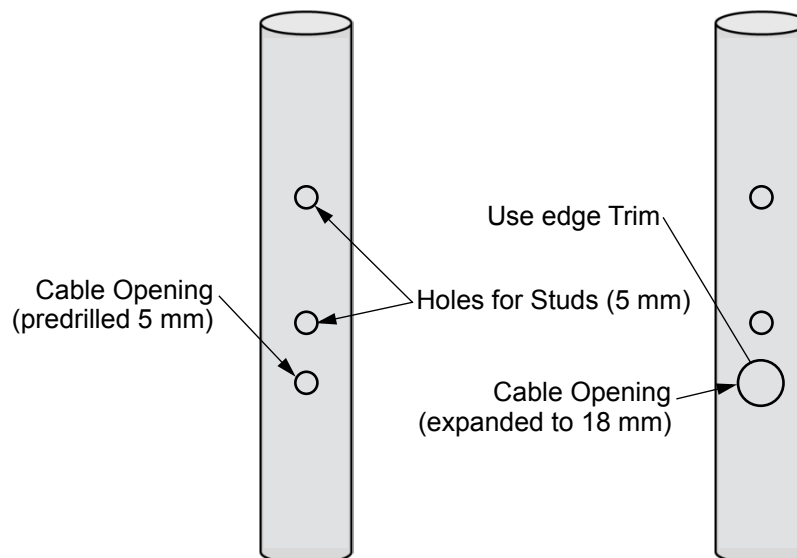


Figure 6-28OV|41 Mounting Openings

STEP 7: Run the Power/Network cable through the pole and pull it out through the cable opening.

STEP 8: First plug in the cables to the OV|41 mounting part (**Figure 6-29**)

STEP 9: Secure the plug to the circuit board by a cable tie see (**Figure 6-29**).

STEP 10: and then place the OV|41 onto the pole by inserting the studs in the designated holes. The studs prevent the OV|41 from twisting on the pole (**Figure 6-30**).

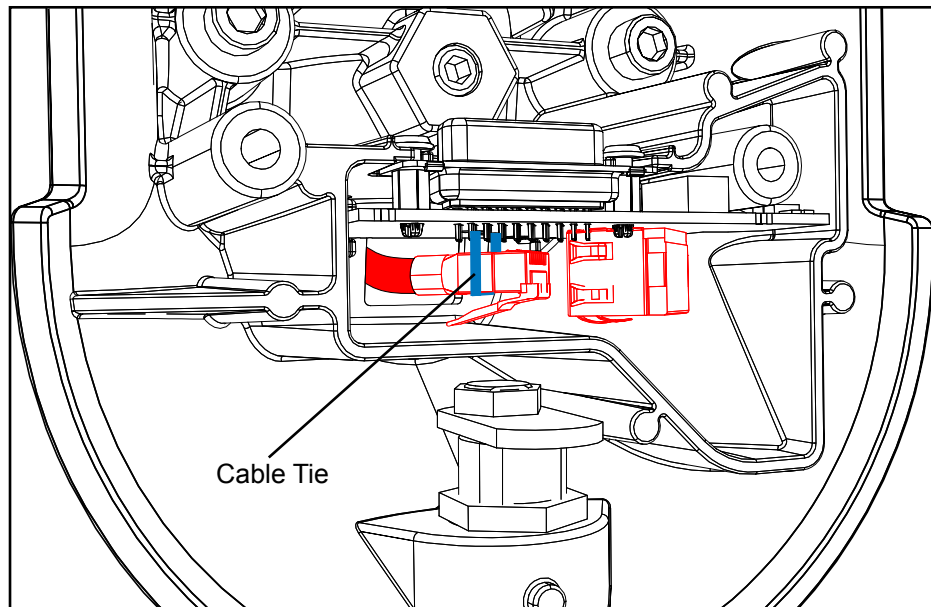
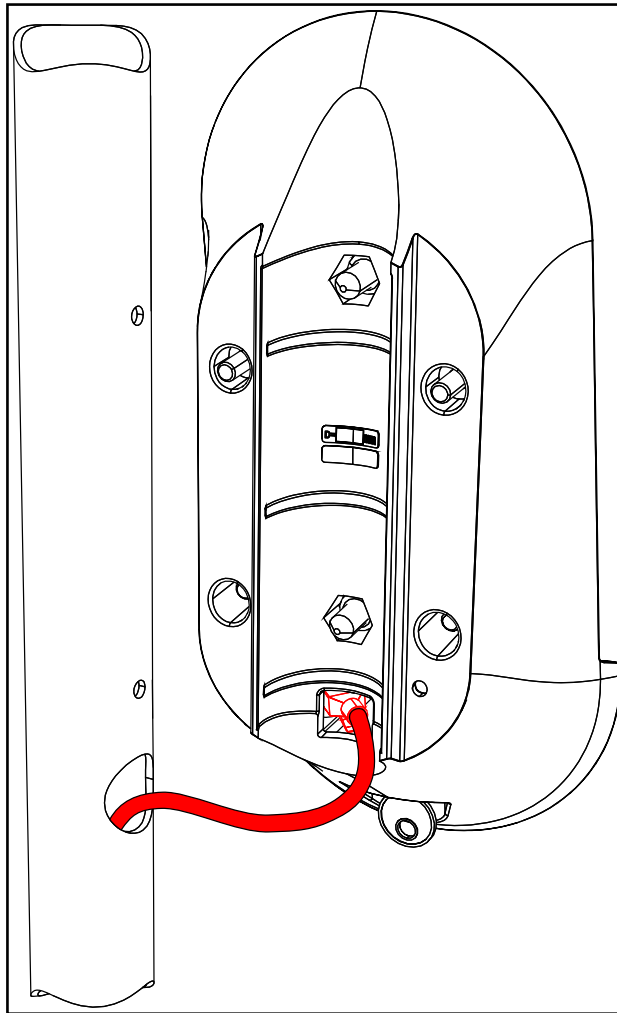


Figure 6-29 Wiring Connection

NOTE:

The cable, must be attached to the back of the OV41 mounting unit.

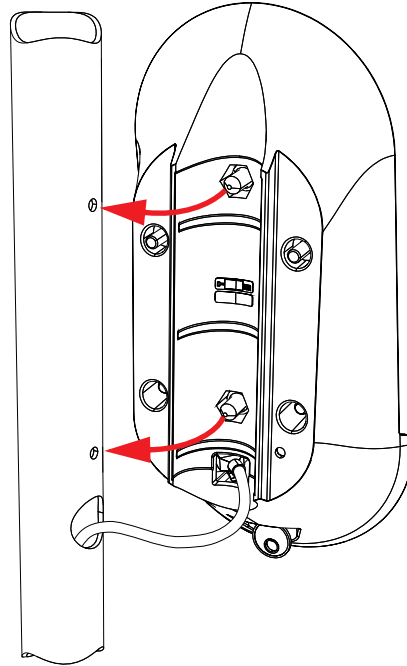


Figure 6-30 Pole Installation

STEP 11: Put the rear part of the mounting unit on the front part of the mounting unit around the pole and fix it with four screws. (see **Figure 6-31**).

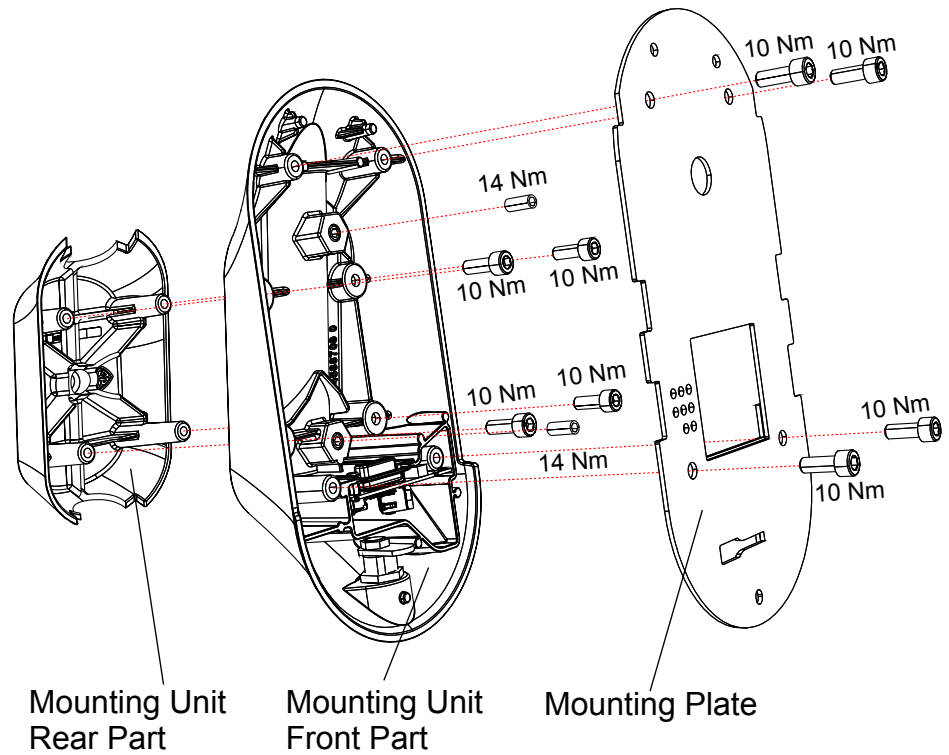


Figure 6-31 Mount the Mounting Unit

STEP 12: Put the mounting plate on the mounting unit front part and fix it with four screws.

STEP 13: Put the base unit on the mounting unit.

STEP 14: Lock the device as shown in **Figure 6-32**.

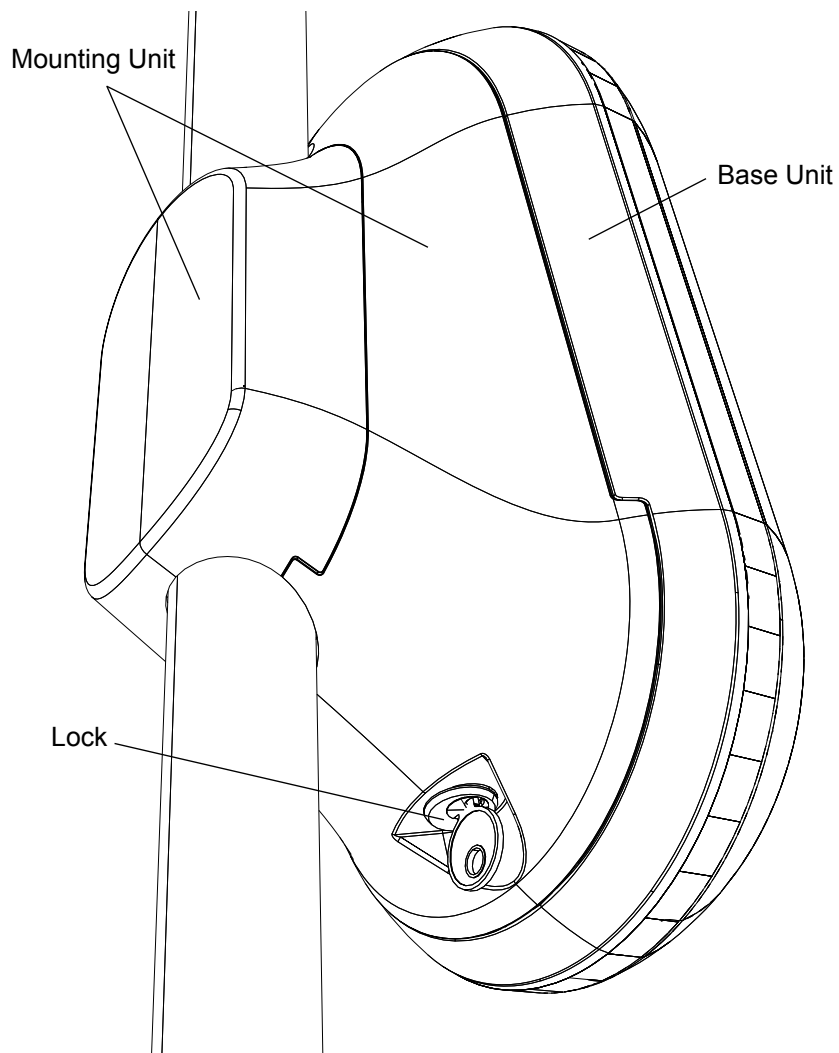


Figure 6-32 Lock

6.9 Post-Installation Checklist

The installer must use the following checklist to verify proper installation of the OV|41 and associated equipment.

- Ensure the stability of the OV|41 on the Pole.
- Verify any attached cables are secure.
- Ensure there is adequate power and network.

6.10 Disassembly and Removal

Should it become necessary to remove the complete OV|41 (mounting unit and base unit) from its permanent location, the following procedure must be followed.



Ensure power to all cables is shut off before starting the removal. Breakers must be shut off and all data cables should be disconnected. Electrical power must be turned off at the source.

STEP 1: Turn off Main Circuit Breaker.

STEP 2: Disassemble the OV|41 in reverse order .

STEP 3: After removing the OV|41, the remaining cables and conduits must be removed by an authorized worker.



Any questions please contact the Environment Agency on 0XXXX XXX XXX.
Registration Number XXXXXXXXX

Chapter 7 OV|41 Initialization

7.1 Initialization This chapter explains how to initialize the OV|41.

7.1.1 Initialize OV|41 With New System Software To perform a base initialization of a OV|41, follow these steps.
For these procedure the OV|41 must have a connection to the software server.

- STEP 1:** Take the base unit from the mounting unit.
- STEP 2:** Remove the service cover.
- STEP 3:** Insert the micro SD card containing the new system software into the "System microSD card" slot (see **Figure 7-33**).



Refer to Figure 7-33 for the location of the micro SD slot that may be used.

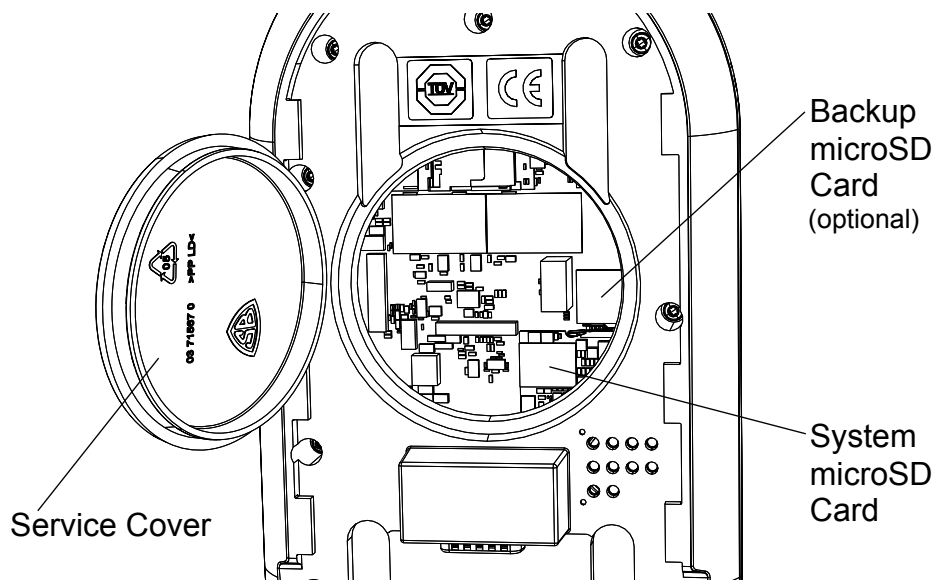


Figure 7-33 Micro SD Card Location

- STEP 4:** Put the base unit on the mounting unit.
- STEP 5:** The OV|41 will run through the boot process.
- STEP 6:** When the device starts up, the Sysnit will be downloaded from the software server.
- STEP 7:** When the device is starting up, the following screen will be shown:

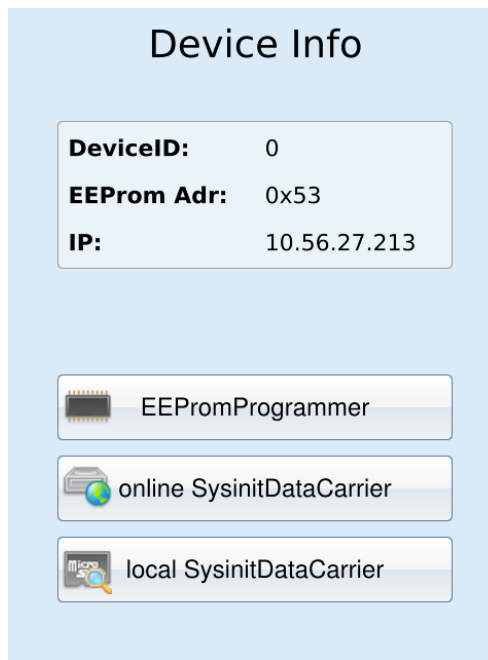


Figure 7-34 SysInit "IDLE" screen

STEP 8: Choose "online SysinitDataCarrier" to download the latest successful build or latest pinned build.

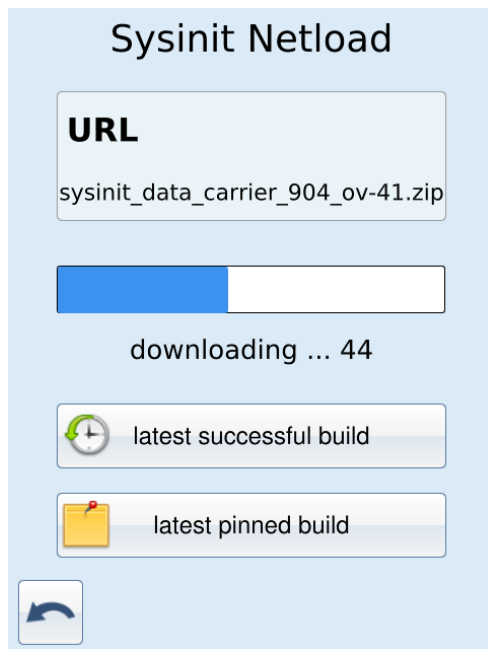


Figure 7-35 SysInit "download" screen

STEP 9: When the SysInit Data Carrier was successfully downloaded, press "run sysinit".

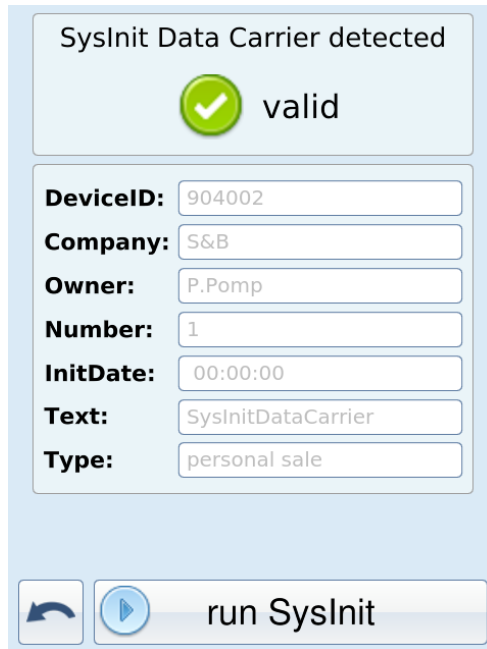


Figure 7-36 SysInit "run SysInit" screen

STEP 10: After a minute the device will reboot. Now you see the processes starting:

```
sbuser@Trizeps7:~$ psiinfo -l
PSI - Process List
Process-ID  Status  (Name)
0x00000020  running (PSI Timer Process)
0x00000021  running (Config Process)
0x00000023  running (Powerfail Process)
0x00000027  running (Tcp32 Process)
0x00000031  running (Crypto Process)
0x00001081  running (Version Control [135_1551])
0x00001088  running (Transaction Recorder [177_1349])
0x00001100  running (DeviceControl [169_1481])
0x00001413  running (Event-/Status-Handler)
0x00002100  running (Service Process [127_1352])
0x00003405  running (Production Process)
0x0000340C  running (Smart Card Process Version 16.9.26,o,r)
0x00003800  running (Payment)
0x00003806  running (LogicalIO [211_1673:16/11/16_0949])
0x00003C50  running (Filetransfer)
0x00003C51  running (OnlineControl)
0x00004C01  running (PxUSB S&B Smartcard Reader)
0xFFFFFFFF  running
0xFFFFFFFFE  running (Rousnp Process)
```

STEP 11: After successful starting of all processes, the customer application will start and the IDLE screen will be displayed.

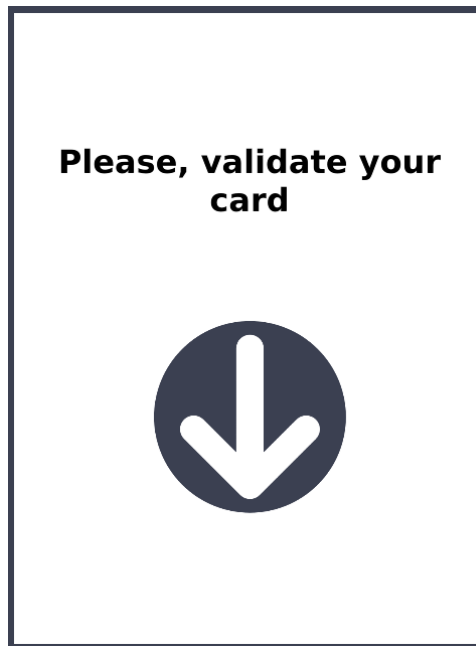


Figure 7-37 Application "IDLE" screen