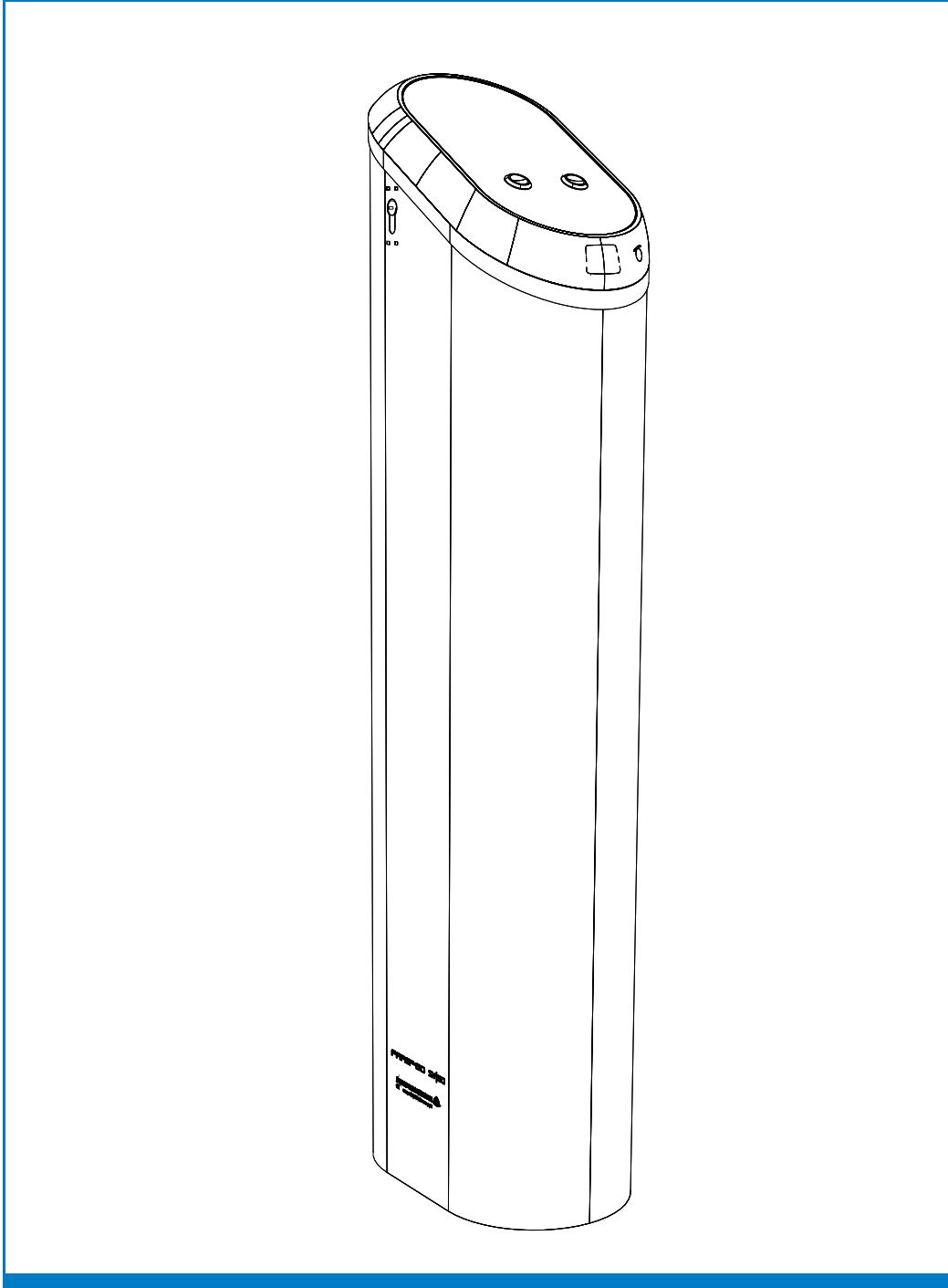


Customer Documentation

State: December 2017

SV|51



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Subject to change.

History

Version	Date	Change	Edit
1.00	09.08.2017	Start Version	Stevens
1.01	25.08.2017	Changes to suggestions of system development	Stevens
1.02	13.12.2017	Changes to suggestions of system development	Stevens

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Chapter 1 Introduction and Safety

1.1 SV|51 Description

The SV|51 Station Platform Validator is a device with read and write capabilities with contactless smartcards. The SV|51 will be floor mounted.

1.1.1 Components

The SV|51 is comprised of six main components as shown below (Figure 5):

- Base Plate
- Power Supply
- Stainless steel column with a welded mounting plate at the bottom
- Adapter Ring
- SV|51 Main Unit
- Lock

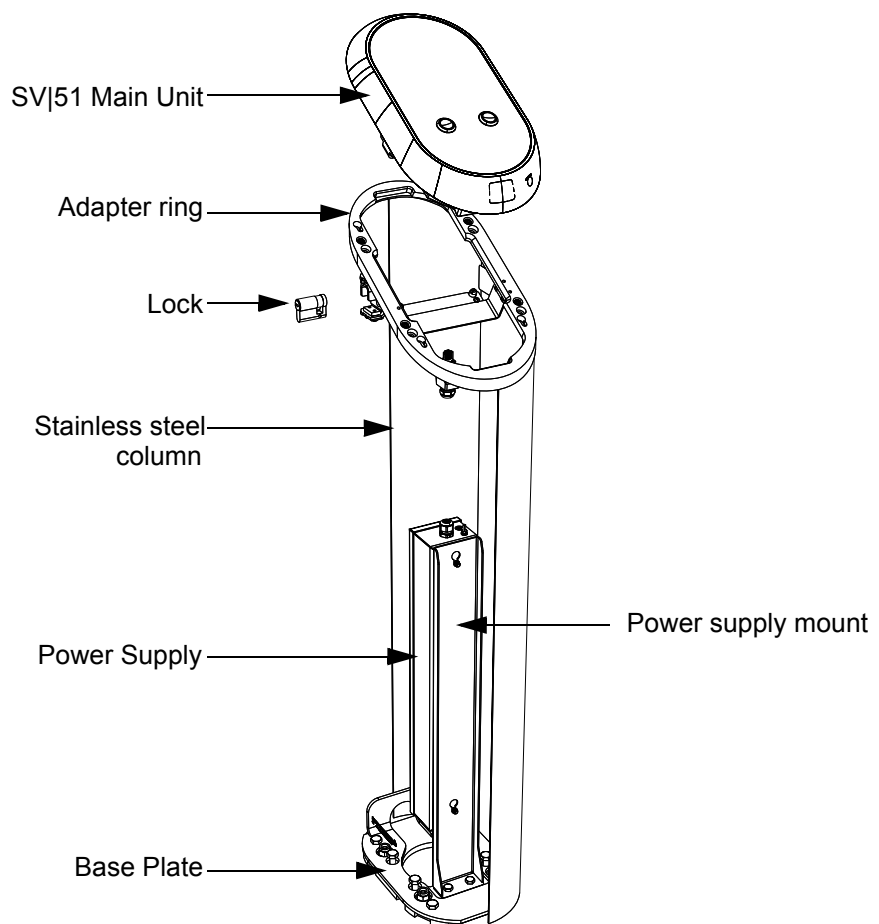


Figure 1-1 Components

1.2 Overview

The Station Fare Transaction Processor Repair and Maintenance Manual (RMM) provides complete, detailed instructions for operating, maintaining, and troubleshooting the Station Fare Transaction Processor. 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.



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.

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 USA

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NOTE:

NOT ALL OF THESE WARNING LABELS OR HAZARDS MAY EXIST IN ALL AFC DEVICES. ONLY THOSE LABELS THAT APPLY TO THE STATION FARE TRANSACTION PROCESSOR, AND ARE REQUIRED TO MEET UL CERTIFICATION REQUIREMENTS, WILL BE FOUND IN THE STATION FARE TRANSACTION PROCESSOR. 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.

1.3 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 Federal, Provincial, 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 machine 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 machine.

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.

Topics covered in this section include:

- 1.1 General Safety Guide
- 1.4 Protective Equipment
- 1.5 Special Tools
- 1.2 Use of Symbols in Manual
- 1.6 Machine Safety Labels



In addition to the safety features listed in this section, which includes specific UL safety labels, additional UL requirements are shown in these three drawings included in Chapter 7: Electrical Installation Mains, Electrical Installation Ethernet, and Mounting Possibilities.

1.1 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 machine.
- 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.
- Due consideration should be given to any safety regulation applicable to the particular location in which the machine is operating.
- Do not turn on power to the machine when components are disconnected.
- The machine 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 machine, all machine control panels must be tagged in compliance with OSHA Lockout/Tagout procedures to indicate that machine should not be operated.

1.4 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.

1.5 Special Tools

There are no special tools required to ensure the safety of the service technician. However, ESD (Electrostatic Discharge: *see paragraph 1.5.8*) 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.

1.2 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.

1.5.1 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.

1.5.2 Caution Symbol

The Caution Symbol indicates a potential for damage to a particular part or function of the machine. 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.

1.5.3 Information Symbol

The Information Symbol indicates special information that could be important for protecting a particular part or function of the machine. 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.

1.5.4 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.

1.5.5 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.

1.5.6 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.

1.5.7 Electrical Hazard Symbol

The Electrical Hazard Symbol indicates the potential for serious damage to the machine 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.

1.5.8 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 machine. 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.

1.5.9 Hot Hazard Symbol

The Hot Hazard Symbol indicates the danger for serious burns caused by surfaces within the machine 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.

1.5.10 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

1.6 Machine 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 machine subassemblies. Not all safety labels may apply to service operations on every subassemblies.

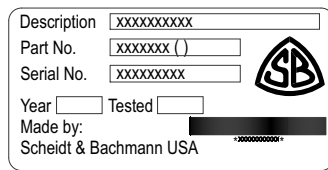
A series of different labels is used within the machine. The following paragraphs describe these labels and note the location within the machine where they will be found. It is important to read and understand this information thoroughly.

1.6.1 Labels On Inside Of Most AFC Enclosures

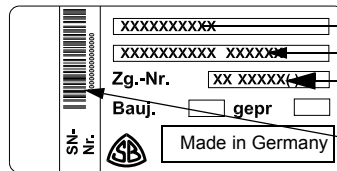
There are several labels used on the assemblies located on the inside of the typical AFC device enclosure. These labels and their meanings are described below.

1.6.1.1 Model Number Labels

The Model Number Label shown in **Figure 1-2** is typically found inside the AFC device on the floor of the enclosure and also on all main modules. There are three different types of labels used. This label indicates the drawing or part number as well as the serial number. The index in brackets 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."

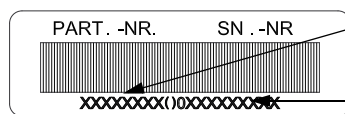


Label for products manufactured by S&B USA, Inc.



Part name
Additional Info.
Part number
Serial number

Label for products manufactured by S&B GmbH (option 1).



Part number with index
Serial number

Label for products manufactured by S&B GmbH (option 2).

Figure 1-2 Model Number Labels

1.6.1.2 CE Label

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

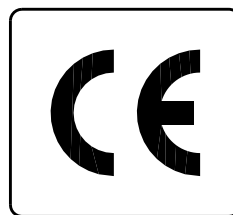


Figure 1-3 CE Label

1.6.1.3 FCC License Label

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



Figure 1-4 FCC-License

**1.6.1.4 TÜV SÜD
NRTL Label**

The TÜV-SÜD-NRTL label shown in **Figure 1-5** appears on the backside of the device.

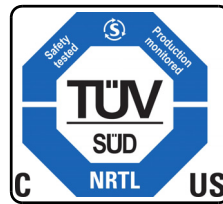


Figure 1-5 NRTL-Label

**1.6.1.5 Electrical
Hazard Label**

The Electrical Hazard label shown in **Figure 1-6** appears on or near certain components located inside the device door and/or enclosure. The label is used to indicate an electrical hazard such as risk of electrical shock that can cause serious injury to the technician or observer that fails to observe the warning.

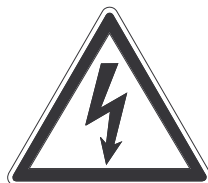


Figure 1-6 Electrical Hazard Label

Special Electrical Hazard Labels are shown in **Figure 1-7** and **Figure 1-8**. **Figure 1-7** located on the customer display inside of the frame of the device.



Figure 1-7 Electrical Hazard Label on the back of most Customer Displays

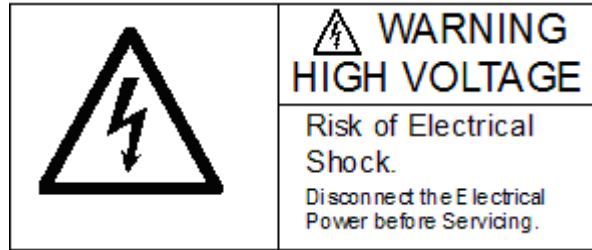


Figure 1-8 Electrical Hazard Label used for the MEM

1.6.1.6 Hot Surface Label

The Hot Surface label shown in **Figure 1-9** below is used on the heater/blower unit to indicate the possibility of burns when touching the heater/blower unit. This label can also be found where other heat or burn hazards may exist.



Figure 1-9 The Hot Surface Label

1.6.1.7 Hand Entanglement/ Rotating Gears Label

The hand entanglement/rotating gears label is used to indicate an entanglement hazard (such as the risk of crushing or cutting fingers) that can cause serious injury to the technician or observer.

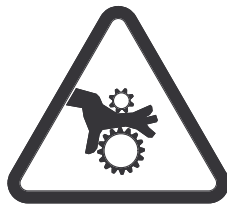


Figure 1-10 The Hand Entanglement/ Rotating Gears Label

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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.

NOTE:

The term "TVM" as used in this glossary is synonymous with the term "FVM" (Fare Vending Machine). The term "TSM" as used in this glossary refers to any AFC device that sells Tickets. It is an all-inclusive term. TVM and TSM are standard AFC-industry acronyms. The SSK is a variation of a TVM.

NOTE:

This is a comprehensive glossary that may include items or terms not used by your transit agency.

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".
AFC	Automatic Fare Collection
Alarm Event	An alarm event is generally defined as the unauthorized opening of an AFC machine.
Alarm System	A combination of sensors in an AFC machine that indicates when the unit has been opened without authorization. May trigger either an audible or silent alarm, depending on the machine design.
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 Computer 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

Bank Account No.	Bank account number of an employee
Bank ID No.	Bank identification number of an employee
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).
Battery Pack	The Battery Pack module supplies 39 VDC if AFC machine main power is lost.
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

CAD/AVL	Computer Aided Dispatch/Automatic Vehicle Locator
Card	A credit, debit, stored value, or “smart” card
Card Reader	See “Credit Card Reader”.
CCS	See “Central Computer System”.
Central Computer System (CCS)	Centralized company file server that collects and distributes operating and system fare collection data. The CCS serves all AFC system connected machines and devices.
Command	Instruction to initiate a special transaction

Command Codes	See "Service Command".
Commuter Rail Server	A computer system that acts as a data conduit between the Central Computer System (CCS) and the Station Controllers at commuter rail stations.
COTS	"Commercial Off The Shelf" equipment
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 AFC machines, 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 CCS 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 FVMs, TOMs, Fare Gates, MEMs, etc.
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 machine. Grounding precautions must be followed whenever this symbol appears.
Element.h	The element.h file defines elements in service/statistic printouts.

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".
Event	Every action that occurs at or in the TSM is defined as event.
Exchange Factor	Factor needed to convert different currencies.

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 AFC machine initialization and backup storage.
FTP	See "File Transfer Protocol".
FVM	See "Fare Vending Machine".

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 machine.
GUI	See "Graphical User Interface".

H

HD	Abbreviation for Hard Disk
Heater	The heater is located in the bottom of the AFC machine housing. It provides heat when activated by a thermal sensor. Also, see Heater/Blower Unit (HBU).
Heater/Blower Unit	The Heater/Blower Unit (HBU) is activated by an environmental temperature sensor, which is typically located above the ECU Main Computer. When activated, the HBU blows cool or warm air (depending on the ambient temperature) over the interior of the device.
Hexadecimal	Numeric system with base 16 (figures from 0 to 15).
HICO	Type of write/read head with high field strength.
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"
ID Reader	Device that reads IDs from magnetic strip cards.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
Intrusion Alarm	In most AFC machines, the intrusion alarm, which may be audible or silent, monitors the outer door. The alarm is triggered when an attempt is made to force open the outer door. The alarm also triggers when too much time elapses before entering the security code or inserting the cylinder lock. Alarm conditions are also reported to the CCS, which then notifies designated individuals or parties.
ISDN	See "Integrated Services Digital Network".
ISO	International Standards Organization

K

KB	Kilobyte (one thousand bytes, where 1 byte equals 8 bits)
Key Pad	See "PIN-pad".

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” .
LCD Panel	Part of the FVM Customer 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> .
Locking System	See “Door Locks”.
Logical Stock	The number used internally by the ticket control software to identify a physical ticket. The “logical stock” number may differ from the actual or “physical stock” number.
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
LRV	Light Rail Vehicle
LUHN-Check	The LUHN-check is an international standard used to protect and proof credit/debit cards.

M

mA	Milliamperere – 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 machine to an in-service condition following a failure (corrective maintenance).
Manipulation Alarm	This alarm (siren) is activated if an attempt is made to open the AFC machine without the correct Personal Identification Number (PIN) being entered within the designated time period.
Manipulation Sensor	This alarm is activated if an attempt is made to open the Ticket Selling Machine without entering the correct Personal Identification Number (PIN).
MAYFAIR	Type of contactless write/read device for chip cards
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.
The Main Computer	The Main Computer is called the Electronic Control Unit (ECU). In most AFC machines, the ECU is located at the top of the cabinet and may contain several expansion boards, such as the Network Interface Board (NIB), Touch Controller (for those that have a Touch Screen), Sound Controller, I/O Board with Watchdog Timer, KR-20 Board, and PCMCIA Adapter.

N

NEMA	National Electrical Manufacturers Association
Network Interface Card	The Network Interface Card (NIC), installed in the ECU, provides an Ethernet-based communications interface between an AFC machine and the Local Area Network (LAN).
NIC	Network Interface Card. Adapter for LAN
Noise	Extraneous or interfering signals present on a system caused by undesirable voltages or currents.
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

PCMCIA	See “Personal Computer Memory Card International Association”.
PCMCIA	Personal Computer Memory Card International Association. In the TSMs it is used as a flash card for data transfer.
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.
Physical Stock	An actual ticket in a roll or a magazine, with an identifying sequential serial number printed on it. The number may differ from the “logical” number assigned by the ticket control software.
PIN	Personal Identification Number.
PIN-Pad	A PIN-pad is used by the customer to enter a PIN code for various Credit/Debit Card operations. Also, as part of the ADA Compliance Standard, the PIN-pad is used as an application steering system for a blind patron.
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.
Power Connection Board	The Power Connection Board, located on the back of the AFC machine housing, connects power and delivers V.11 communication protocol to other microprocessor-based components.
Power Connection Box	The Power Connection Box is typically located in the bottom right of the machine cabinet, but may be mounted elsewhere in some machines. The unit routes 120 VAC Main Power to the appropriate subsystems in the AFC machine.
Power Pack	The NT-20 PP/3 Power Pack, a switching power supply, plugs into the V.11 Power Connection Board. The Power Pack converts incoming 120 VAC to the various DC operating voltages required for AFC machine components and devices.
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.
RTU	Remote Terminal Unit

S

S&B	Scheidt & Bachmann-USA, Inc.
SBC-1	Scheidt & Bachmann Main Computer System. Used in all S&B manufactured AFC machines that require a computer. Also referred to as the ECU (Electronic Control Unit.)
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 Display	See "Service Terminal Display".
Smart Card Reader	A device that reads the encoded value stored on a smart card.
SONET	See "Synchronous Optical Network".
Sound Card	The Sound Card, located in the ECU Main Computer, provides voice messages for the speaker and head phone jack, when available.
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.
Synchronous Optical Network (SONET)	An ANSI standard for fiber optic networks.
System	Devices that are integrated to perform a specific function, such as the Coin Processing System, Bank Note System, and so on.
System Support Record	This file contains the rows of the screen "User data". It is downloaded to the Ticket Selling Machines.

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 machine to another machine anywhere on the Internet. The IP facilitates this transfer of data by placing the bytes into packets that are easily transmitted.
Temperature Sensor	A thermal sensor, connected to the Temperature Regulator Board, that monitors the internal temperature of the AFC machine housing. When the temperature moves outside an acceptable preset range (39.2 degrees F to 149 degrees F), the Temperature Regulator Board automatically turns off the machine.
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.

Touch Controller Monitors the AFC Machine 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.

U

UL See "Underwriters Laboratories, Inc."

Underwriters Laboratories, Inc. Underwriters Laboratories, Inc. – The testing agency that certifies the safety and effectiveness of specific electrical, fire, and security equipment

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

VDC Volts Direct Current

Version Group of data downloaded to the devices.

VGA Abbreviation for video graphics array

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

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Chapter 3 Declaration of Conformity

3.1 Europe

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

The SV51 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 Installation and Initialization

4.1 Overview

The SV|51 installation instructions described in this chapter explain how to install the devices, but do not prepare the machines for operation. Once installation is complete, the installer should follow the SV|51 Initialization instructions.

The following information and instructions are provided for the installer of a SV|51.

- To avoid damage, deliver SV|51 equipment to the installation location in the original packaging and Scheidt & Bachmann wrapping.
- The SV|51 device is installed in locations chosen by the Transit Authority.
- The SV|51 is a device that is able to read and write to contactless smartcards.

NOTE:

Placement of the SV|51s is at the discretion of the customer.



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

4.1.1 Components

The SV|51 has six main components:

- the base plate
- the power supply
- the stainless steel column with a welded mounting plate at the bottom
- the adapter ring
- the SV|51 Main Unit
- the lock

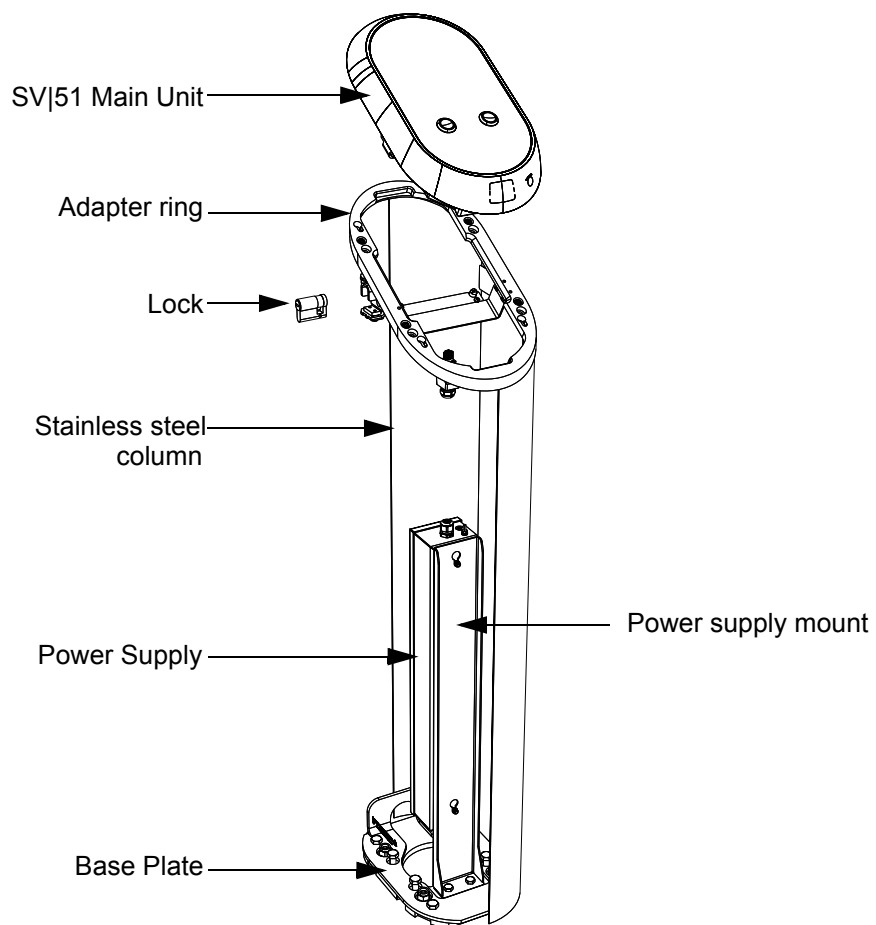


Figure 4-11 The Union Pearson Express Station Fare Transaction Processor



The safety labels shown in the section Machine Safety Labels must be followed. Review them carefully before proceeding.SV|51

4.3 Power

For 120V/60Hz, power was read at 17.26W, apparent power at 17.62, current at 0.146A (146mA) and cos of 0.980. The power value is acceptable as it is less than 17.5 W. At 230V/50Hz, power was read at 20.38 W, apparent power at 25.97VA, current at 0.113A (113mA) and cos of 0.785. These values are acceptable. The estimated power consumption is in **Table 4-3**.

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

Table 4-3 Power Consumption



In the event of a power failure, the SV|51 will perform an orderly shutdown based on the energy stored in local capacitors. When power is restored, the SV|51 will start up and return to full operation without the need for manual intervention.

4.4 Block Diagram

Figure 4-12 is the Block Diagram for the device.

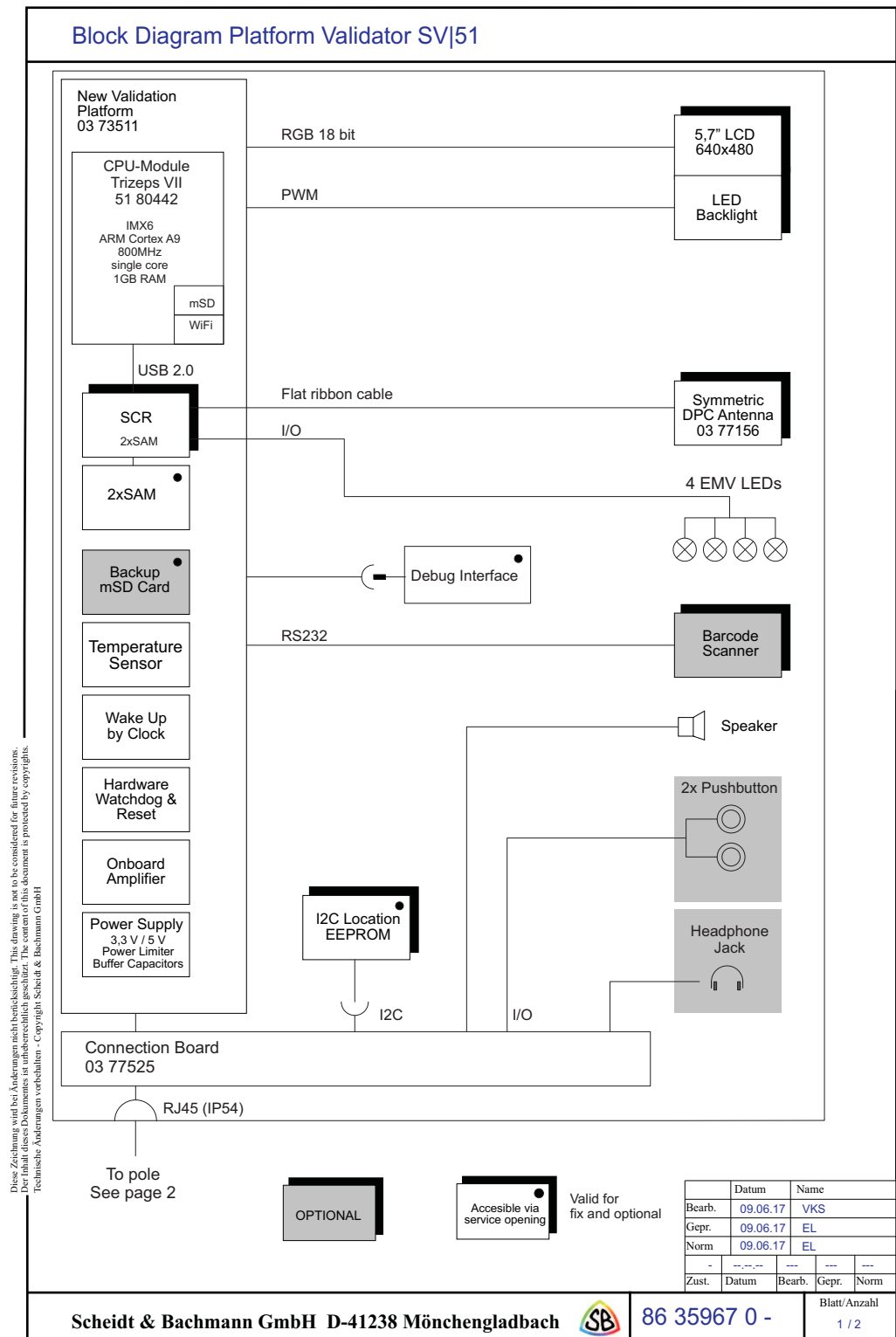
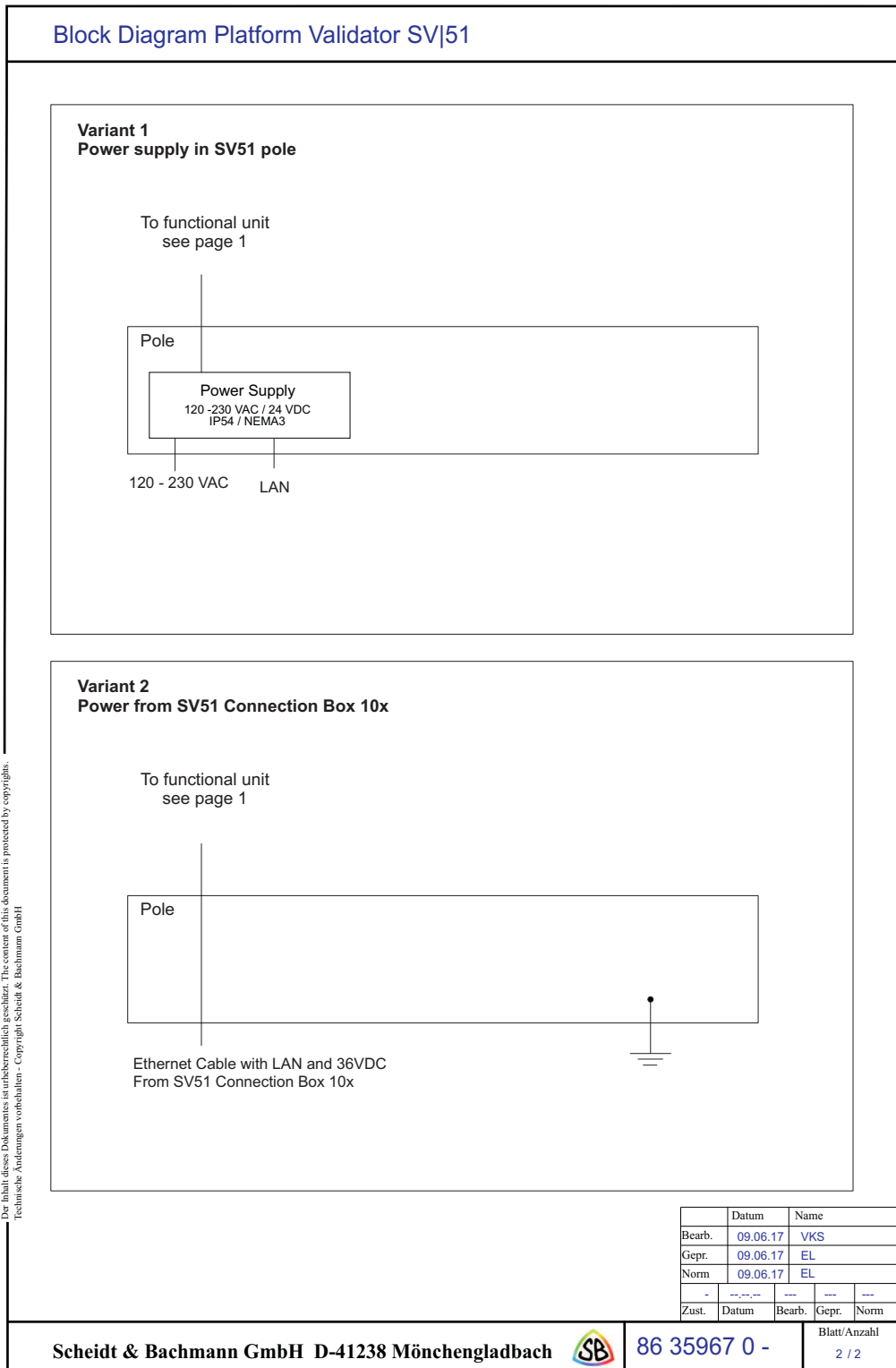


Figure 4-12 Block Diagram SV|51 Page 1 of 2



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Figure 4-13 Block Diagram SV|51 Page 2 of 2

4.5 Column Variations/ Conduit Entry Points

The SV|51 column provides two options for conduit entry (**Figure 4-14**). The first is at the bottom through the mounting plate. The second is through an opening provided at the rear of the SV|51 column. The PRESTO customized opening has a height of 70 mm and width of 30 mm with a rounded top.

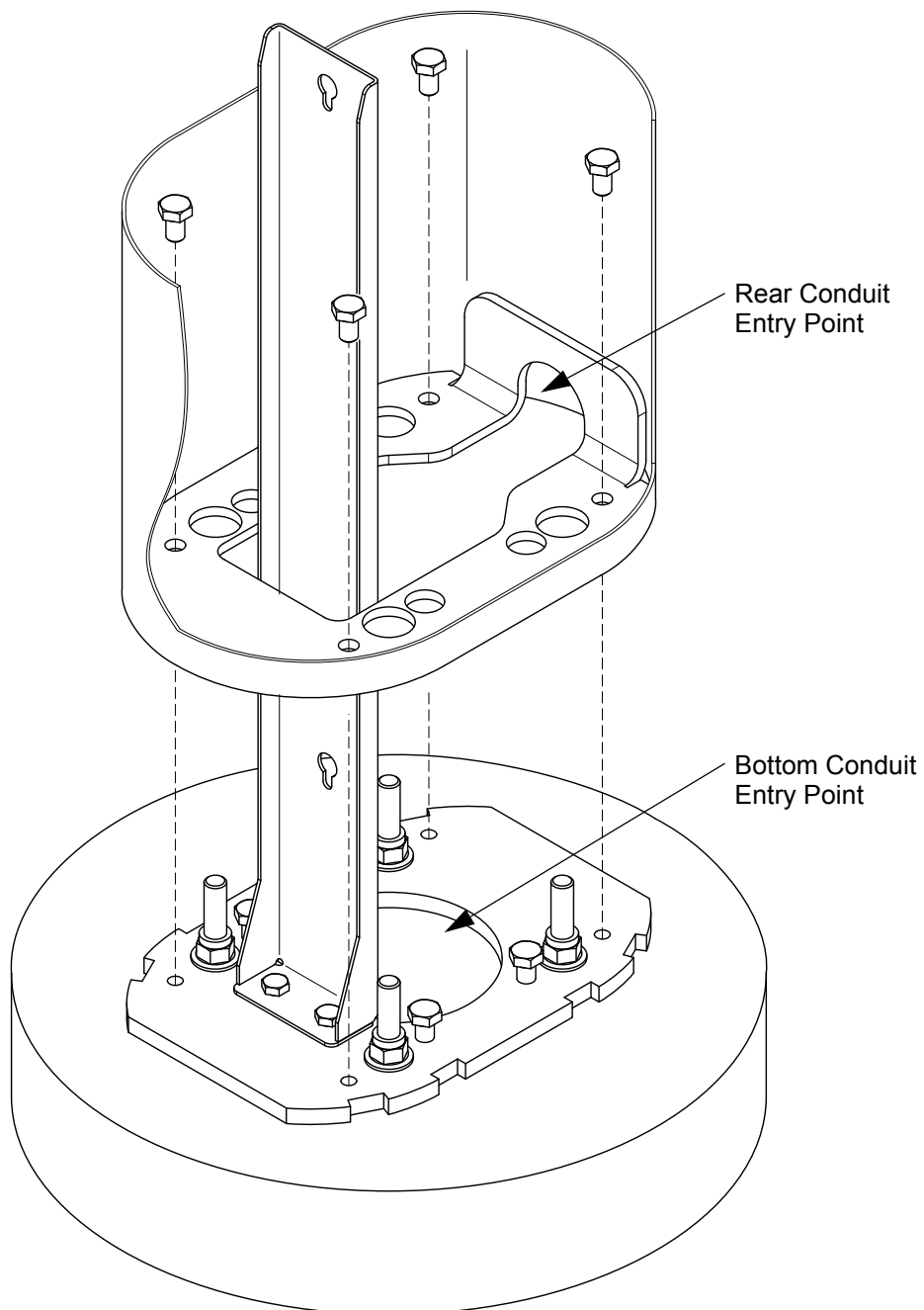


Figure 4-14 SV|51 Conduit Entry Points

4.6 Mounting Options

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

4.1.2 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.

4.1.3 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 4-15**).

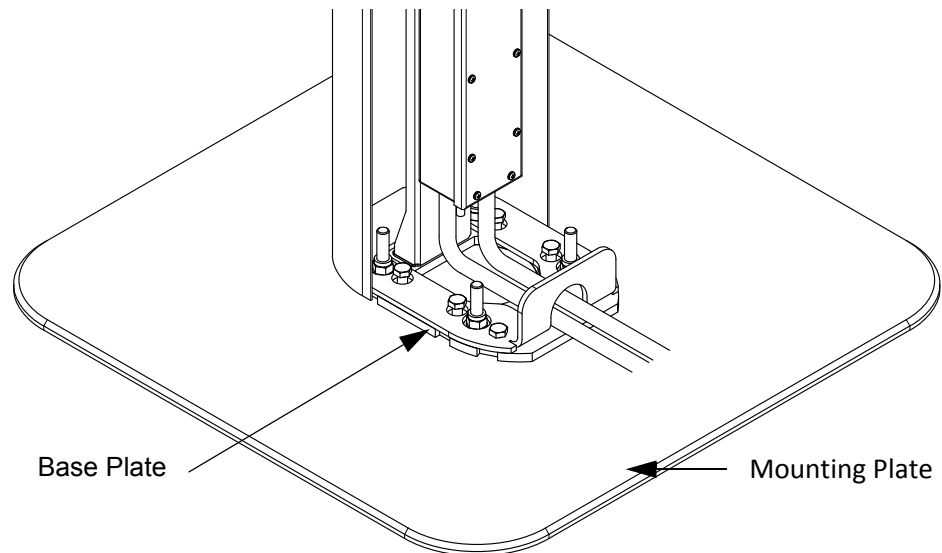


Figure 4-15 Mounting Plate for Adhesive Option

NOTE:

By selecting the gluing mounting 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.

NOTE:

Ensure sable and even ground!

4.7 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 cat6 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.

4.1.4 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 4-15**). The conduit lengths must be a minimum of 300mm from rear entry point of SV|51 column. A minimum length of 470mm of power cable and 770mm of data cable must be available from the rear entry point of the SV|51 column.

4.1.5 Bottom Conduit Entry

Both power and data conduits must feed into the SV|51 column through the hole in the SV|51 baseplate (**Figure 4-16**). The conduit lengths must be a minimum of 130mm from bottom of SV|51 column. A minimum length of 300mm of power cable and 600mm of data cable must be available from the bottom of SV|51 column.

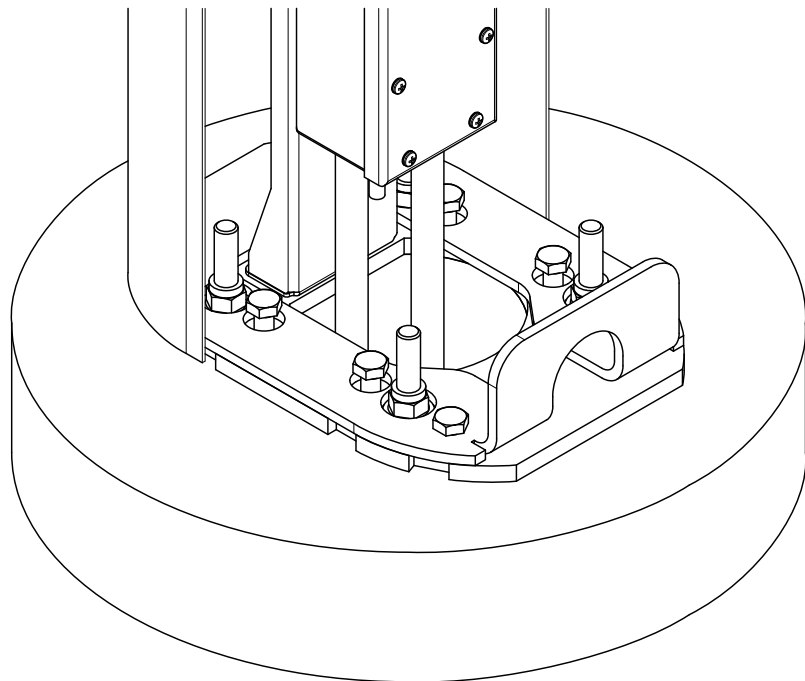


Figure 4-16 Bottom Conduit Entry

4.8 Installation Scheidt & Bachmann will provide one set of items listed in the Bill of Materials (**Table 4-4**) with each SV|51.

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

Qty	Part Name	S&B p/n
1	SV 51 Validator	03 71656
1	Floor Plate (for glued down solution)	03 71688
1	Lock	86 33878
4	Collared Hexagon Nut M12	70 03705
4	Washer for M12	
1	Power Supply Unit incl. cable with RJ45 connector	03 71274
1	Holder for power supply 5103485	03 71273
2	Screw for holder, M8	70 03058
2	Washers for M*	
2	Screw for Power Supply	70 03661
4	M10 Hexagon Screw, optional if levelling is required	70 03133
4	Screws for securing column to baseplate	70 01474
4	Screws for securing adapter ring to the column	70 03072
1	Stainless Steel Column (Housing)	03 71705
1	Base Plate	03 71272
3	End sleeve power cable (optional, for stranded power cables)	n/a

Table 4-4 Bill of Materials

4.1.7 Tools Required At a minimum, the installation of the SV|51 will require the following tools:

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

4.8.1 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.

4.1.8 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 4-17**. The front side would be the closest side to the user if they were using the SV|51 front face.

4.1.8.1 Drilled solution

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

4.8.1.1 Adhesive solution

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

Use a wrench to secure the base plate on the concrete/floor plate by means of a washer and a nut for each of the four bolts as shown in **Figure 4-17**.

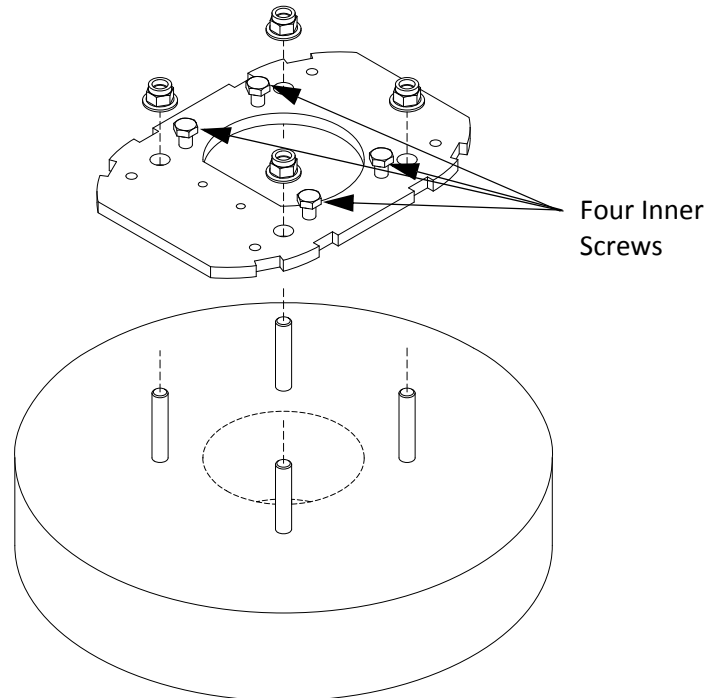


Figure 4-17 Generic Base Plate

Ensure the base plate is level by using a bubble level.

If the base plate is not level, the four inner screws (on the same side) shown in **Figure 4-17** may be used to level the base plate.

4.8.2 Attaching the Power Supply Mount to the Base Plate

The Power Supply Unit is comprised of two parts: the Power Supply Mount and 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 4-18**). Assemble the Power Supply Mount on the level base plate using two hexagonal screws and tighten.

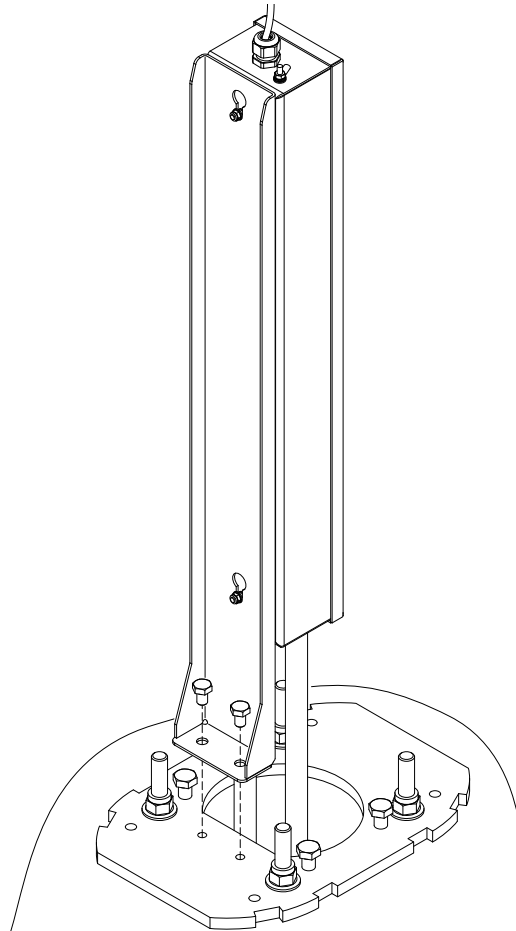


Figure 4-18 Power Supply Mount

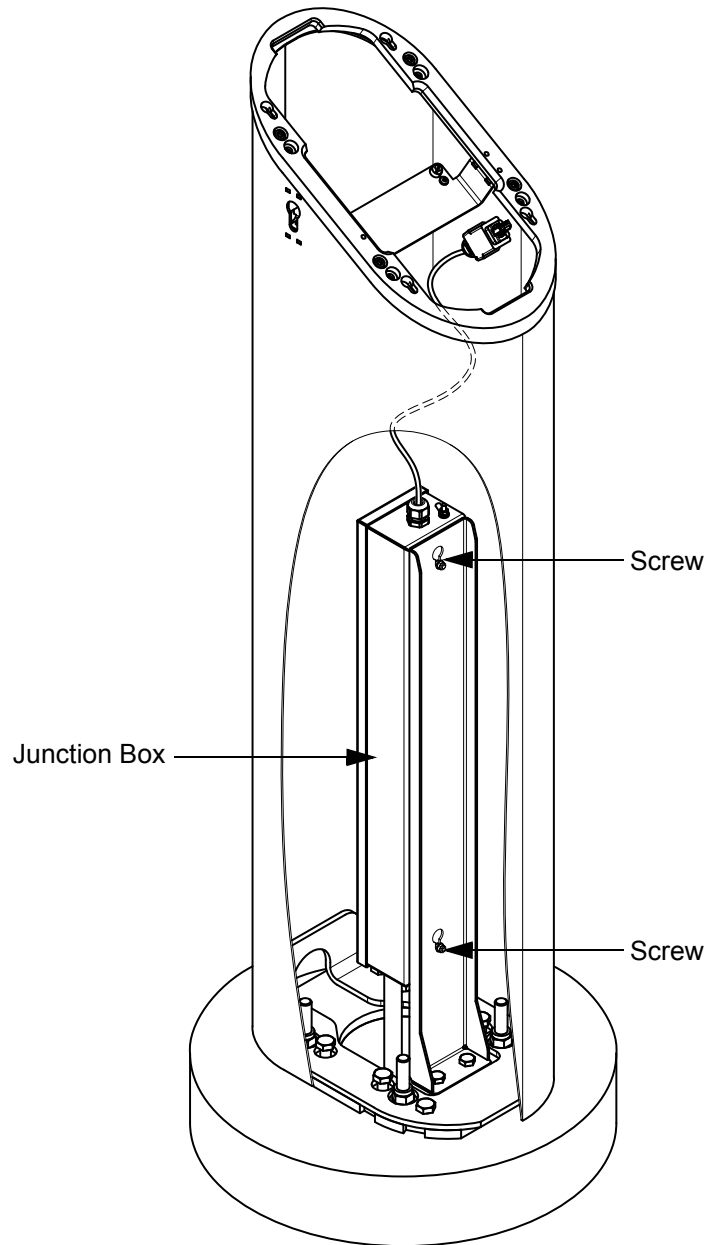


Figure 4-19 Power Supply Junction Box Mounted

4.8.3 Connecting Cables

- 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.



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.

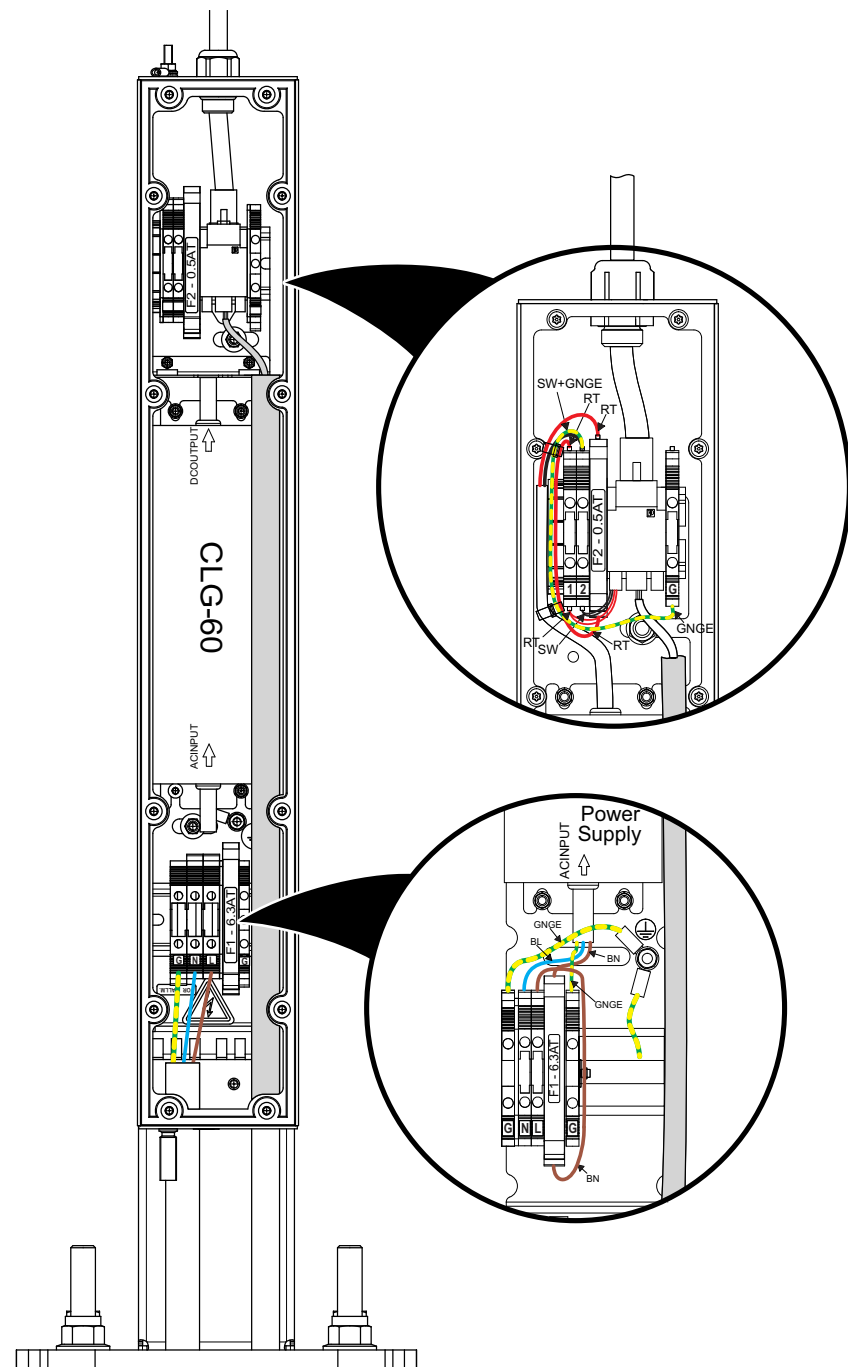


Figure 4-20 Cable Connections

STEP 3: Bottom Fed Conduit Entry: Ensure the power source and data cables are passed through conduits from the bottom of the column up to the two entrance points at the bottom of the Power Supply Junction Box.

Side Fed Conduit Entry: Ensure the power source and data cables are passed through conduits from the back of the column up to the two entrance points at the bottom of the Power Supply Junction Box.

STEP 4: The installer may choose which liquid sealants and fittings to use.

STEP 5: Connect the power source to its respective termination points at the bottom of the Power Supply Junction Box as shown in **Figure 4-20**.

STEP 6: Run the data cable through the internal conduit and insert it at its termination point near the top of the Power Supply Junction Box.

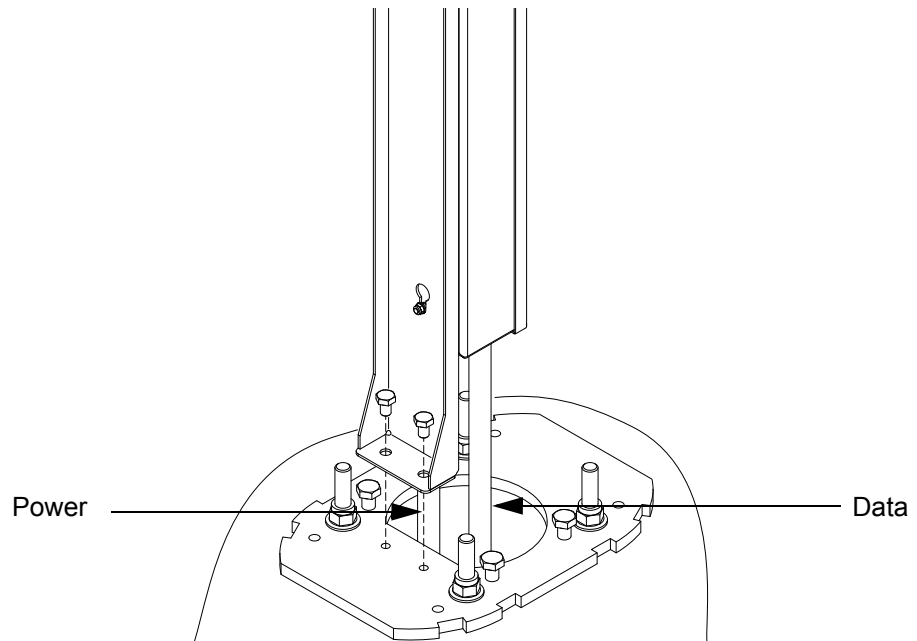


Figure 4-21 Data and Power Cables

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. The other side of the pre-installed cable will be connected to the back of the SV|51 main unit.

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

4.8.4 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 back side of the power supply unit.

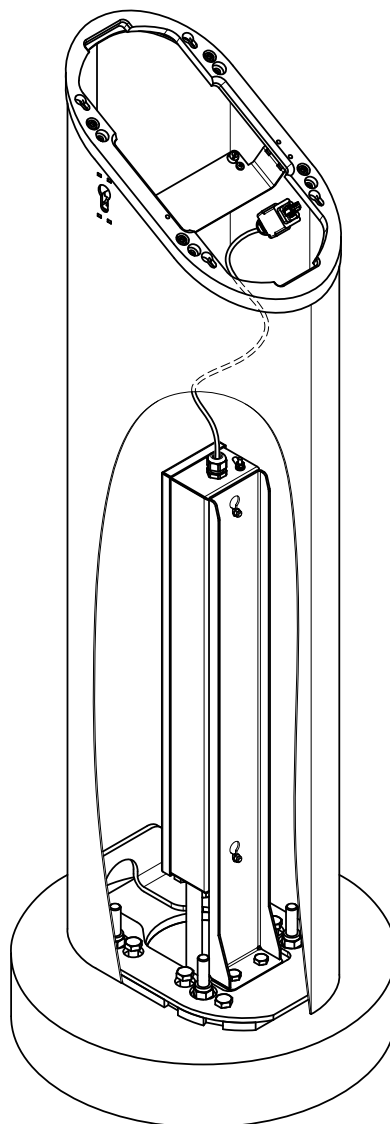


Figure 4-22 Orientation of the Column with Respect to the Power Supply Unit

- 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.

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 3:** Use a bubble level to ensure that the column is indeed level.

4.8.5 Mounting the Adapter Ring

The adapter ring has eight holes, four of which are used for the floor mount solution and the other four are included for a potential wall-mounted SV|51.

Figure 4-23 shows the orientation of the adapter ring on the column and the four holes that are used for the floor mount solution.

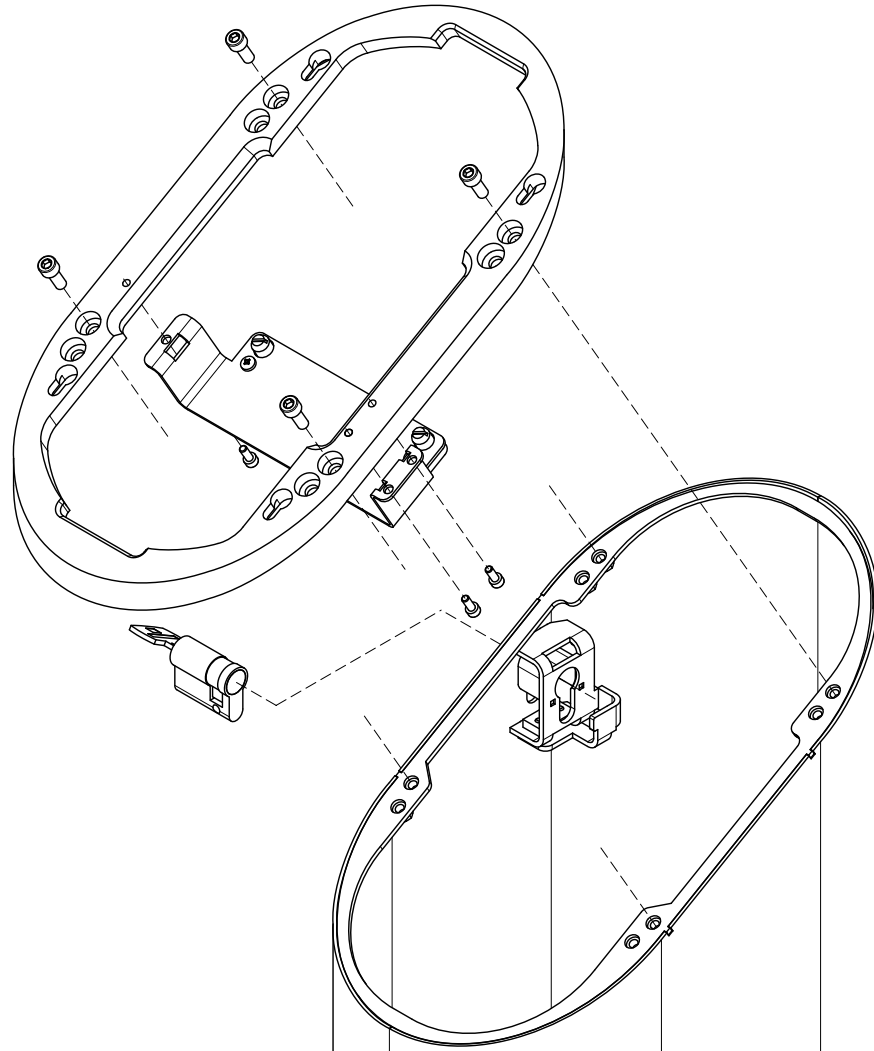


Figure 4-23 Adapter Ring Orientation and Screws

- STEP 1:** Place the adapter ring on top of the column and slide the adapter ring from top to bottom until it fits into place.
- STEP 2:** Ensure that the four screw openings of the adapter ring are aligned with the corresponding four screw openings of the adapter ring mount.
- STEP 3:** Use four screws to secure the adapter ring to the column.

4.8.6 Power and Data Connections for the SV|51

The other side of the cable connected to the termination point of the Power Supply Junction Box connects to the back of the SV|51 to provide power and data connection (**Figure 4-24**).

- STEP 1:** Plug-in the RJ Industrial 10G Ethernet Cable Termination into the termination point of the validator.

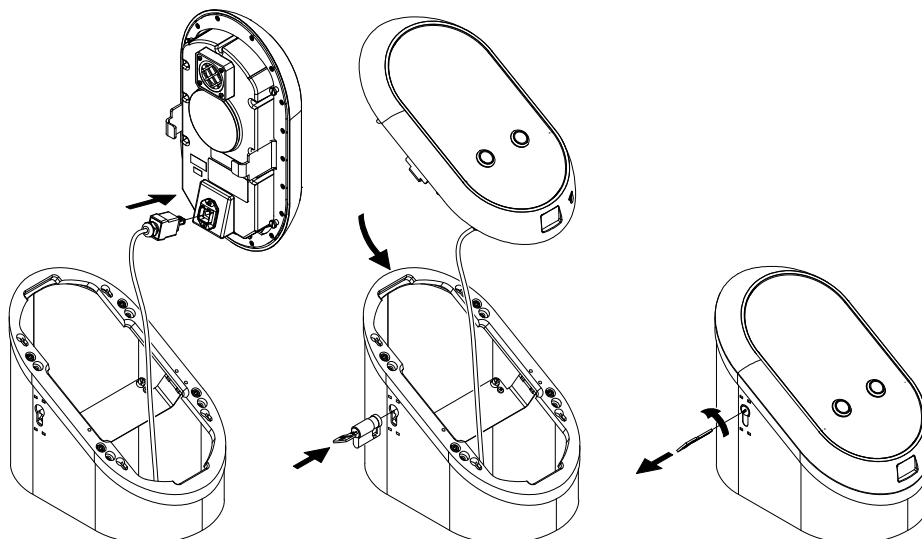


Figure 4-24 SV|51 Main Unit Assembly

NOTE:

The four mushroom screws on the back of the SV|51 are pre-assembled into the validator.

- STEP 2:** Hold the SV|51 on top of the adapter ring
- STEP 3:** Align the four Mushroom Screws on the back of the SV|51 with the appropriate holes in the adapter ring.
- STEP 4:** Slide the validator down to secure it on top of the adapter ring.
- STEP 1:** Put the lock into the side of the column.
- STEP 2:** Lock the lock using the special key provided.

4.9 Initialization

4.1.9 SV|51 Provisioning Prerequisites

The following are the prerequisites for device provisioning:

- New Device with the required firmware already installed
- Personalized SAM card installed in the Device
- Device is connected to the Production network/environment
- Device Provisioning SD Card (SD Card A) which contains the PDS Device Application installer packages
- Location-specific labeled SD Card (SD Card B) containing Device Configuration Data (Config.xml)
- Factory SD Card

4.1.9.1 Technical Specifications

Mechanical dimensions Width x Height x Depth	<ul style="list-style-type: none"> ■ W = 200 mm (including Edge Connector) ■ H = 1127 mm ■ D = 320 mm
Weight	<ul style="list-style-type: none"> ■ ?????
RoHS compliance	<ul style="list-style-type: none"> ■ This product has been designed and manufactured in compliance with Directive 2002/95/EC of the European Parliament and the Council on restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive).
Radio	<ul style="list-style-type: none"> ■ 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 µW
IP rating (ingress protection)	<ul style="list-style-type: none"> ■ IP 54 (dust protected but not tight / splashing water from all directions) ■ The SV 51 pole is not water tight, but the power supply is (NEMA3)
IK rating (impact protection)	<ul style="list-style-type: none"> ■ IK 10 for option without buttons (20 Joule = 5 kg / 40 cm) ■ IK 09 for option with buttons (10 Joule = 5 kg / 20 cm) <p>Acceptance criteria: No break of front glass allowed but minor optical impacts like scratches are allowed.</p>
Temperature	<ul style="list-style-type: none"> ■ Operating temperature: -30 to +50°C ■ Storage temperature: -40 to +70°C
Humidity	<ul style="list-style-type: none"> ■ 10% to 95% not condensing
Mechanical Stress (Vibration test by ISO 16750-3)	<ul style="list-style-type: none"> ■ Not required - (stationary device)
Electrical Safety	<ul style="list-style-type: none"> ■ EN 62368 ■ EN 60950-22 (outdoor equipment)
EMC/EMI	<ul style="list-style-type: none"> ■ Emission: EN 61000-6-4 (class A) ■ Immunity: EN 50121-4 (class A)
Immunity against overvoltage	<ul style="list-style-type: none"> ■ The immunity to overvoltage is the task of the baseboard were the Smart Card Reader is plugged in. (The Smart Card Reader must always be supplied with a defined voltage)
Flammability	<ul style="list-style-type: none"> ■ UL 94 V1

Chapter 5 Module Removal

5.1 Module Removal

This section discusses how to remove and replace components. Turn off power at the main facility breaker before proceeding. **Figure 5-25** shows the front and back views of the main unit.

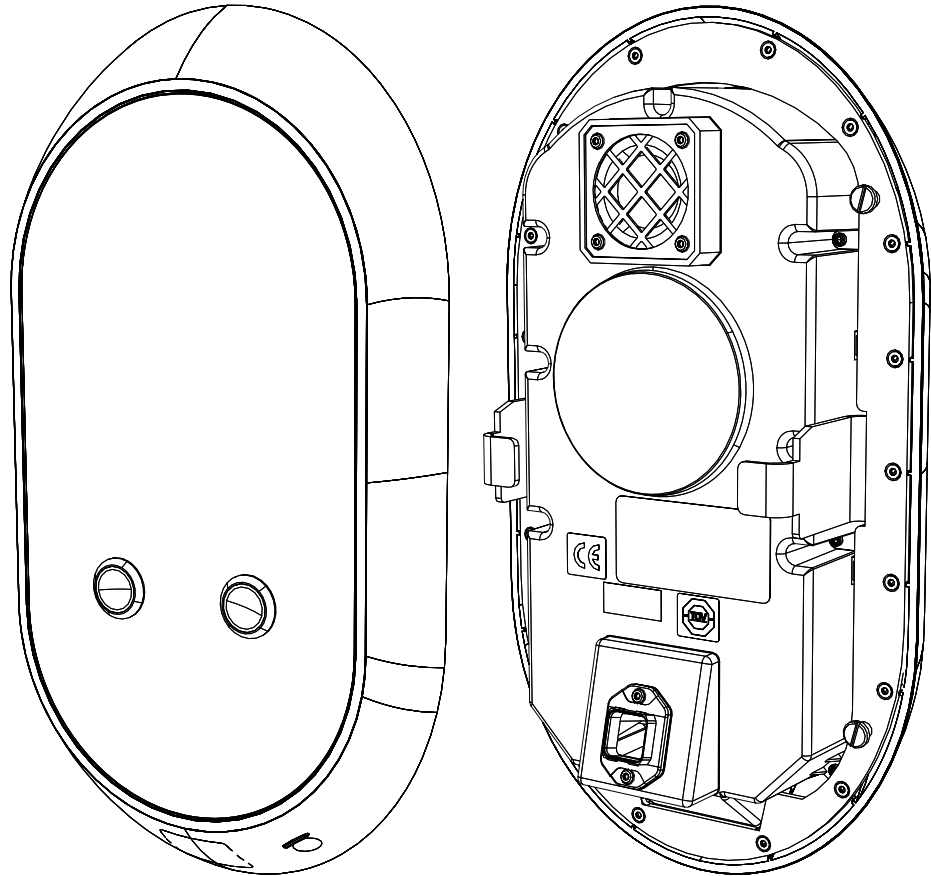


Figure 5-25 Front and Back Views of the main unit



These steps assume the installers followed the procedures outlined in 4.1.4 Side Conduit Entry or 4.1.5 Bottom Conduit Entry. If there is not enough slack in the wires, as specified in the Installation Procedures, alternative steps must be followed. See “Alternative Procedure” on page 57.

5.9.1 Main Unit

The drawing in **Figure 5-26** illustrates how to open the SV|51 and remove the main unit.

- STEP 1:** Use the key to unlock the device.
- STEP 2:** Slide the main unit up and then pull up and away to disconnect it from the stainless steel column.
- STEP 3:** Remove the cable.
- STEP 4:** Plug the cable into the new main unit.
- STEP 5:** Place the new main unit in the proper position on the stainless steel column and then press down and slide to connect.
- STEP 6:** Use the key to lock the device.

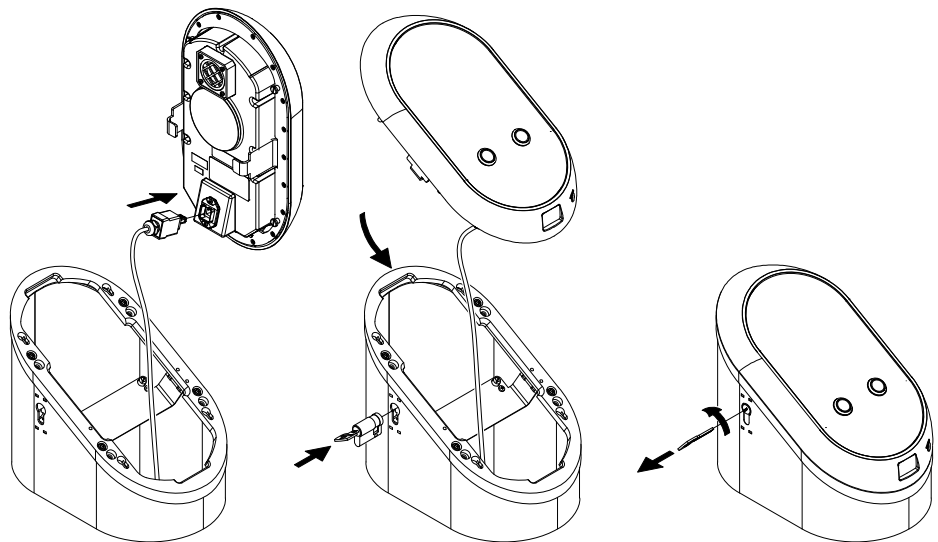


Figure 5-26 SV|51 Main Unit Removal

5.10 Accessing the Power Supply After removing the main unit as described in section 5.9.1, it is necessary to access the power supply junction box. Use **Figure 5-27** 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.

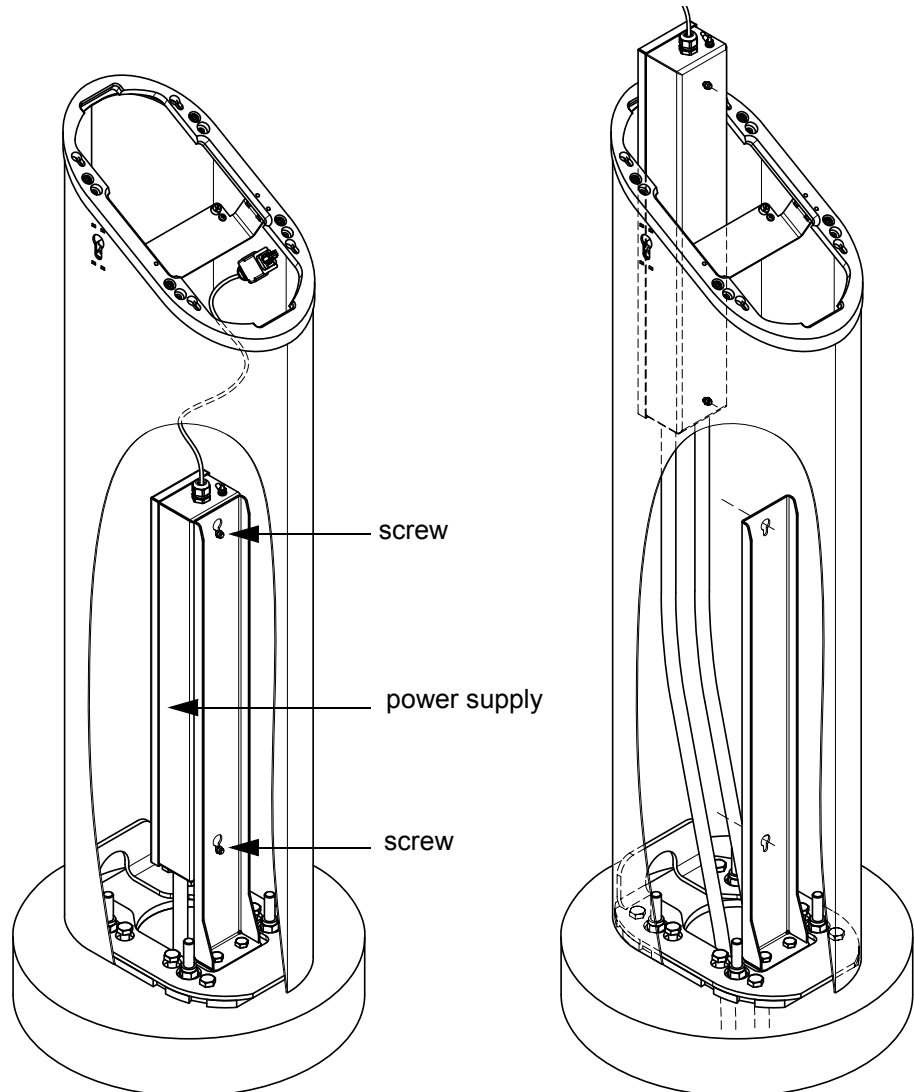


Figure 5-27 Accessing the Power Supply

5.10.1 Fuse Replacement

The drawing in **Figure 5-28** shows how to replace the fuses in the main unit of the SV|51.

- STEP 1:** Remove the main unit as described in section **5.9.1** and the power supply junction box as described in section **5.10**.
- 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:** Replace 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 unit and slide it into position.
- STEP 8:** Tighten the two screws with a ratchet to secure the Power Supply Mount to its holder.

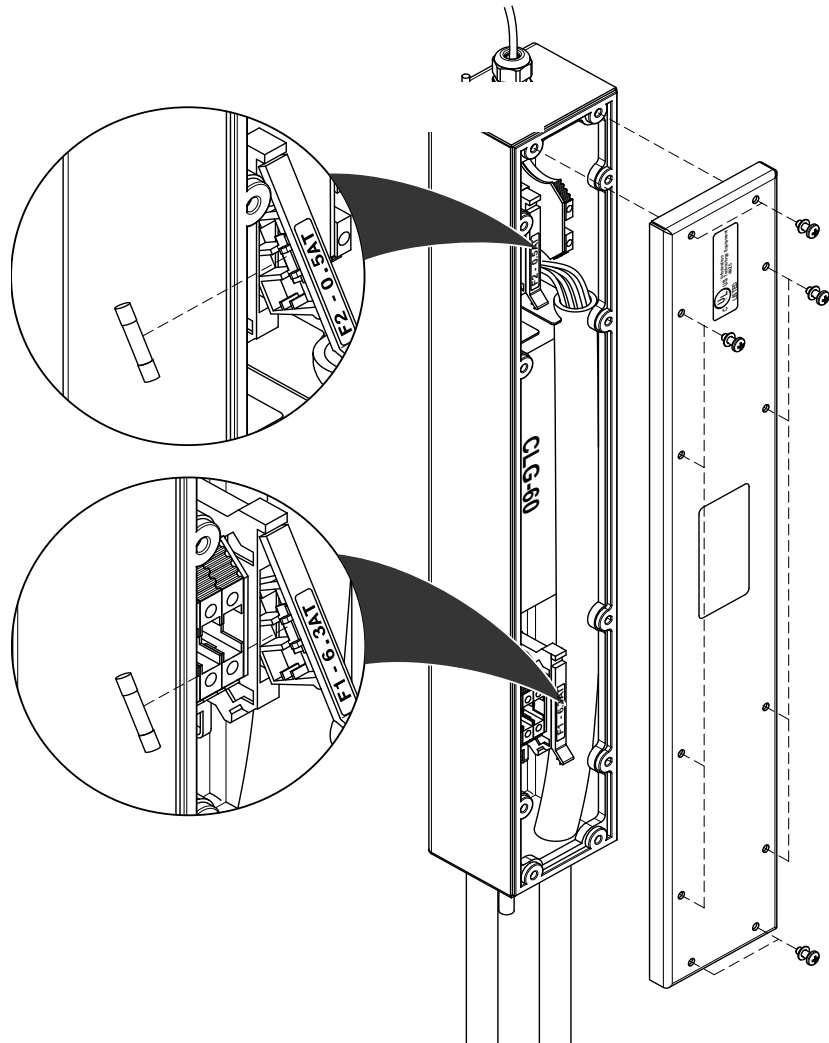


Figure 5-28 Fuse Replacement

- STEP 9:** Re-install the main unit (**Figure 5-29**).

STEP 10: Lock the device.

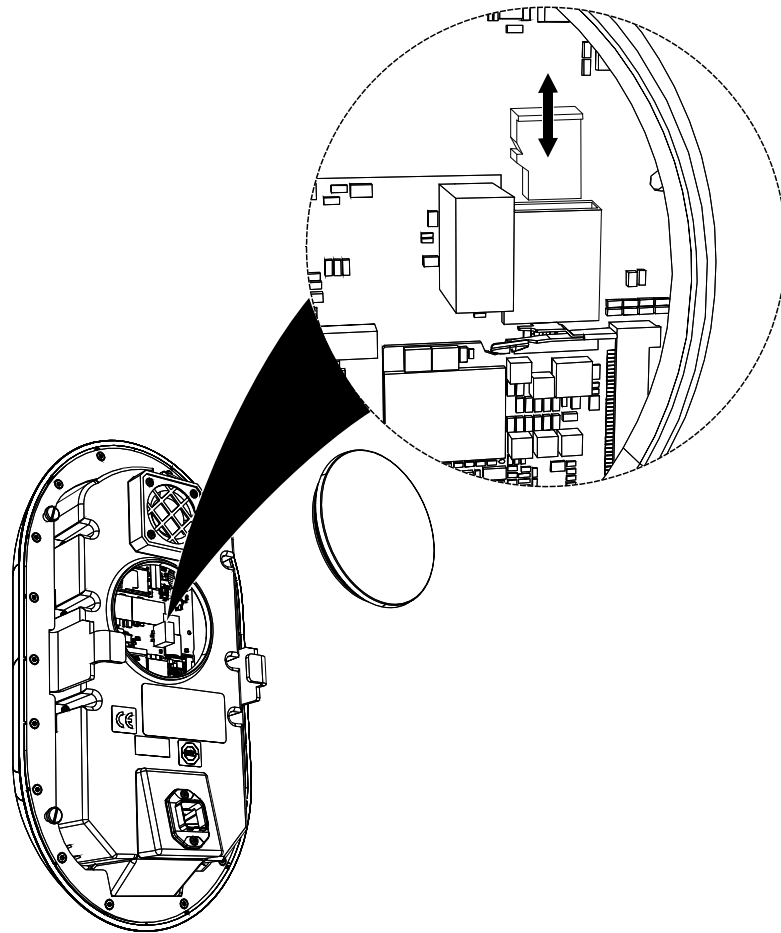


Figure 5-29 MicroSD Card Removal

5.2 MicroSD Card Removal and Replacement

The drawing in **Figure 5-29** shows how to remove and replace the MicroSD Card in the main unit.

- STEP 1:** Remove the main unit as described in section **5.9.1**.
- STEP 2:** Remove the plate as shown in **Figure 5-29**.
- STEP 3:** Remove the MicroSD Card.
- STEP 4:** Replace the MicroSD Card.
- STEP 5:** Place the main unit on the stainless steel column and complete locking as shown in **Figure 5-30**.



Only the shown MicroSD Card gets replaced in the field. S&B will ship the device with the SD card on the CPU module inserted.

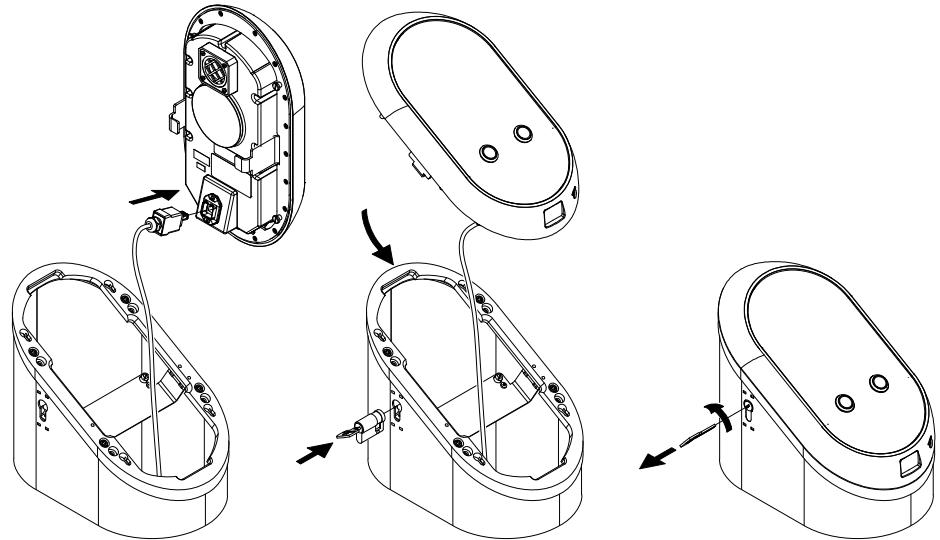


Figure 5-30 Main Unit Installation

5.3 Tools and Consumables

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

Device or Component Name	Part Number
SV 51 main unit	86 XXXX
Lock	86 XXXX
Key	86 XXXX
MicroSD Cards	51 03826 or local purchase

Table 5-5 Part Numbers

5.11 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 main unit as specified in **5.9.1**

STEP 3: Remove the stainless steel column.

- Remove all caulking around the base.
- 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.
- Lift the stainless steel column up until there is enough clearance to avoid damaging any components and set it aside.

STEP 4: At this point, it is possible to access the power supply.

- Follow the steps in **5.10** and **5.10.1** to replace fuses and reattach the power supply to the power supply mount.

STEP 5: Reinstall the stainless steel column as specified in **4.1.8 Mounting the Column to the Base Plate**.

STEP 6: Re-install the main unit (**Figure 5-30**).

STEP 7: Lock the device.

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Chapter 6 Preventive Maintenance

6.1 General Maintenance and Cleaning

The following general preventive maintenance procedures are for the overall maintenance and cleaning of the SV|51. 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. Turn off power at the main facility breaker before proceeding.

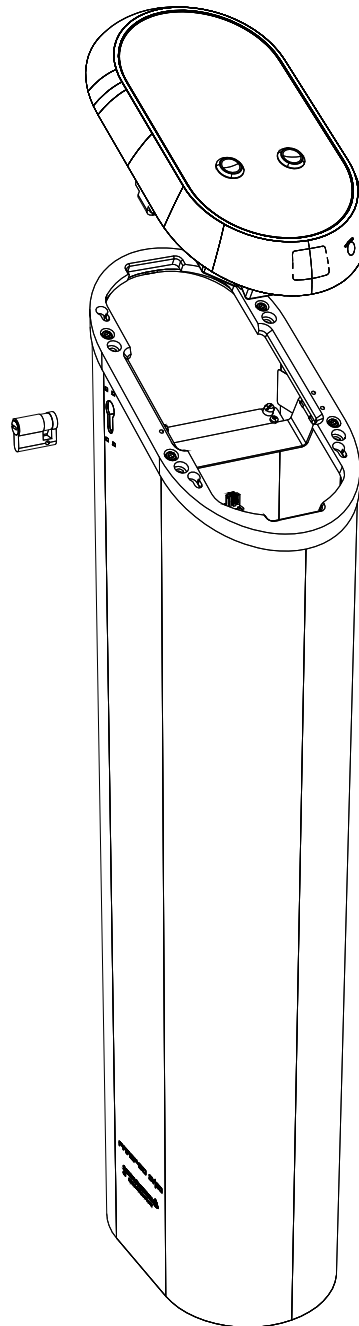


Figure 6-31 SV|51

6.12 Preventive Maintenance Schedule Summary



Table 6-6 is a single source that summarizes all of the preventive maintenance (PM) 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 machines 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 machines and locations where experience shows more frequent preventive maintenance will reduce field maintenance.

Table 6-6 Recommended PM Schedule/Frequency

FREQUENCY	DESCRIPTION	REFERENCE
Every Month	Cleaning and Visual Inspection of the Exterior	Section 6.2.2
	Screen Preventive Maintenance	Section 6.2.3
	Lock Preventive Maintenance	Section 6.2.4
Every Three Months	Cleaning and Visual Inspection of the Interior	Section 6.2.1

6.2 Materials and Replacement Parts

Table 6-7 provides a complete list of the materials and replacement parts needed to perform preventive maintenance on the SV|51.

ITEM	DESCRIPTION	WHERE USED
Canned Air		General Use
Alcohol	Isopropyl, (70% min.)	General Use
Lexan Cleaner	Windex (or other mild cleanser)	Customer Display
Heavy Duty Shop Cloths	Lint-free, soft	Miscellaneous Use
8633729 PRESTO Card Tap Sticker	Sticker	Card Tap Area

Table 6-7 Materials and Replacement Parts

6.13 Complete Assembly

Follow these procedures for the preventive maintenance of the SV|51.

6.2.1 Cleaning and Visual Inspection of Interior

Preventive maintenance cycle: Every 3 months

- STEP 1:** Remove any foreign materials from the inside of the SV|51 (see section **6.2**).
- STEP 2:** Use canned air to remove small particles from the interior of the SV|51.
- STEP 3:** Clean the interior surface of the SV|51 Housing with alcohol.
- STEP 4:** Inspect the mounting of all the components.
- STEP 5:** Visually inspect the condition of all cables for wear and chafing.

6.2.2 Cleaning and Visual Inspection of Exterior

The exterior of the SV|51 should be kept clean.

Preventive maintenance cycle: Every Month

- STEP 1:** Clean exterior of SV|51 with alcohol (see section **6.2**).
- STEP 2:** Visually inspect the SV|51 exterior for damage.

6.2.3 Screen

Preventive maintenance cycle: Every Month

Perform the following maintenance and cleaning procedures for the Screen:

- STEP 1:** Clean exterior surface of the screen with a soft lint-free cloth and screen/window cleaner (see section **6.2**).



Do not use an acid-based cleaner.

- STEP 2:** Visually check the Display glass for any cracks or other damage.

6.2.4 Test for proper adjustment of the Lock Switch

The SV|51 Lock Switch must be checked for proper adjustment.

- STEP 1:** Insert the key into the lock and turn.
- STEP 2:** Turn the key to the closed position and remove.

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Chapter 7 IPC

7.1 IPC Pages

IPC in this chapter give the customer an overview of the SV|51.

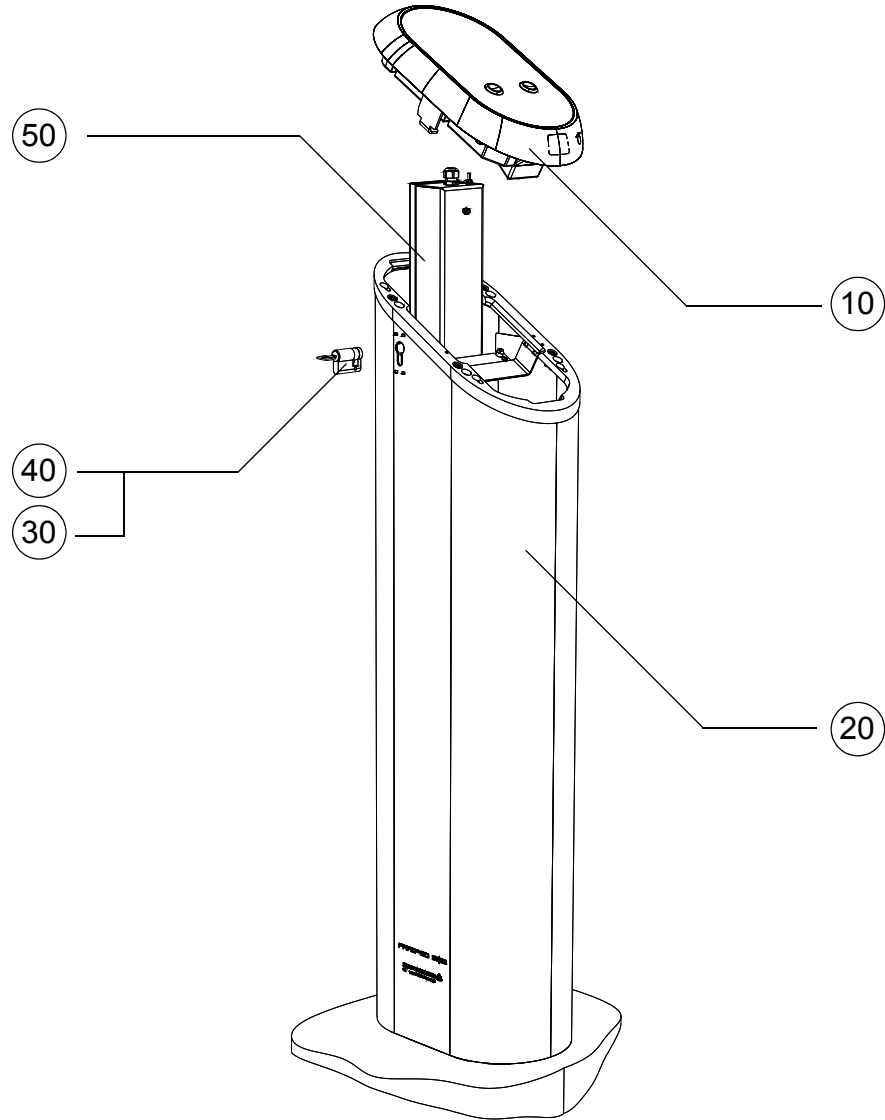


Figure Item	S&B Part Number	Part Description	Available as Spare Part	LLA	Qty
10	86XXXX	Functional Unit			1
20	0371705	Housing 0371292 Welded			1
30	86XXXX	Key			1
40	86XXXX	Lock			1
50	0371274	Junction Box for SV-50			1

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