



Point of Sale (POS) Systems

Site Preparation Manual

Computer Programs and Documentation

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Federal Communications Commission (FCC) Warning

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

Approvals

Gilbarco is an ISO 9001:2008 registered company.

Underwriters Laboratories (UL):

U L File#	Products listed with U L
MH1941	All Gilbarco pumps and dispensers that bear the UL listing mark.
MH8467	Transac System 1000 and PAM 1000
E105106	Dell DHM Minitower
E165027	G-SITE and Passport Systems

California Air Resources Board (CARB):

Executive Order #	Product
G-70-52-AM	Balance Vapor Recovery
G-70-150-AE	VaporVac

National Conference of Weights and Measures (NCWM) - Certificate of Conformance (CoC):

Gilbarco pumps and dispensers are evaluated by NCWM under the National Type Evaluation Program (NTEP). NCWM has issued the following CoC:

CoC#	Product	Model #	CoC#	Product	Model #
02-019	Encore	Nxx	02-036	Legacy	Jxxx
02-020	Eclipse	Exx	02-037	G-SITE Printer (Epson)	PA0307
02-025	Meter - C Series	PA024NC10		G-SITE Distribution Box	PA0306
	Meter - C Series	PA024TC10		G-SITE Keyboard	PA0304
02-029	CRIND	—		G-SITE Mini Tower	PA0301
	TS-1000 Console	—		G-SITE Monitor	PA0303
	TS-1000 Controller	PA0241		G-SITE Printer (Citizen)	PA0308
02-030	Distribution Box	PA0242	02-038	C+ Meter	T19976
	Meter - EC Series	PA024EC10	02-039	Passport	PA0324
	VaporVac Kits	CV	02-040	Ecometer	T20453
			05-001	Titan	KXXY Series

Trademarks

Non-registered trademarks

Applause™ Media System	G-CAT™	MPD™	Surge Management System™
CIM™	Gilbert™	Optimum Series™	Tank Monitor™
C-PAM™	G-SITE® Link™	PAM 1000™	TCR™
Dimension™	G-SITE® Lite™	PAM 5000™	Titan™
Ecometer™	G-SITE™	PAM™	The Advantage™ Series
ECR™	Highline™	Passport™	Trimline
EMC™	Horizon™	SMART CRIND™	Ultra-Hi™
Eclipse™	InfoScreen™	SMART Meter™	ValueLine™
e-CRIND™	MultiLine™	SmartPad™	
FlexPay™	Making Things Better™	Super-Hi™	

Registered trademarks

CRIND®	GOLD SM
Encore®	
Gilbarco®	
Legacy®	
Performer®	
Transac®	
TRIND®	
VaporVac®	

Additional U.S. and foreign trademarks pending.

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Use of these names, logos, and brands does not imply endorsement.

Table of Contents

1 – Introduction	1-1
Intended Users	1-1
Scope	1-1
Related Documents	1-1
Gilbarco Documents	1-1
Manufacturer's Instructions	1-2
Technical Reference Documents	1-2
Abbreviations and Acronyms	1-3
Technical Support	1-4
Using This Manual	1-4
2 – Important Safety Information	2-1
3 – Site Wiring Requirements	3-1
Certificate of Conformance (CoC)	3-1
Hazardous Zones	3-1
AC Power Distribution Components	3-1
AC Power Wiring	3-3
Circuit Breakers	3-5
Conduits	3-5
Emergency Cutoff Switches	3-6
Integrated Site Panels	3-6
Isolated Ground Receptacles	3-7
Sub-panels	3-8
Miscellaneous Wiring Guidelines	3-8
AC Power Transient Voltage Surge Suppression	3-9
Data Line Wiring Requirements	3-9
Passport System Express Lane Self-Checkout and Express Order	3-9
4 – Grounding	4-1
Importance of Grounding	4-1
Single Point Grounding System Required	4-1
Earth Ground Systems	4-1
Responsibilities of the Electrical Contractor	4-1
Earth Ground System Components	4-1
Single Point Earth Ground System	4-2
Typical Earth Ground Electrode System	4-2
Factors Affecting Earth to Electrode Impedance	4-2
Connecting the Electrode to the Electrical System	4-2
Testing Electrode Impedance	4-2
AC Ground (Safety/Equipment Ground) Systems	4-2
Responsibilities of General and Electrical Contractors	4-3
System Testing	4-3

Table of Contents

Power and Grounding Verification	4-3
Test Equipment	4-3
Testing	4-4
Verifying Earth Grounding Electrodes	4-4
Measurements	4-4
AC Wiring Tests	4-5
Impedance Test	4-6
5 – Components and Peripherals for POS Systems	5-1
Passport System	5-1
6 – Hardware Specifications: System Components	6-1
Passport System	6-1
Hazardous Zones	6-1
7 – Hardware Specifications: Peripherals	7-1
Passport System	7-1
8 – Monitor Resolution Setting	8-1
Setting Monitor Resolution	8-1
Index	Index-1

1 – Introduction

This manual provides site preparation information for Gilbarco® Point of Sale (POS) equipment and systems.

Intended Users

This manual is intended for individuals responsible for constructing gasoline service station sites where POS equipment is being installed, including the following:

- Architects
- General contractors
- Electrical contractors
- Major Oil Company (MOC) engineers

The manual is also intended for individuals who troubleshoot and correct problems, including the following:

- Authorized Service Contractors (ASC)
- Customer support personnel
- Contractors
- Engineering personnel

Scope

This manual provides site preparation instructions for the following products:

- Passport™ Systems
- Transac® System 1000
- PAM™ 1000 System
- Passport Express Lane Self-Checkout System
- Express Ordering Food Service System Passport EDGE System

Related Documents

This subsection provides references to the following types of related documents:

- Gilbarco documents
- Manufacturer's instructions
- Technical reference documents

Gilbarco Documents

The following Gilbarco documents contain related information and may be helpful when preparing a site:

Document Number	Title	GOLD SM Library
MDE-2383	Transac System 1000 Installation Manual	Transac Products
MDE-2537	PAM 1000™ System Controller Installation	Transac Products
MDE-2713	Universal Distribution Box (D-Box) Installation Manual	Advantage® & Legacy® Models
MDE-2833	Pumps and Dispensers Site Preparation	Site Prep

Document Number	Title	GOLD SM Library
MDE-3116	Distribution Box PA0306 Installation Instructions	Advantage & Legacy Models
MDE-3802	Encore® and Eclipse® Site Preparation Manual	<ul style="list-style-type: none"> • Encore and Eclipse • Encore and Eclipse Installers • Footprint & Elevation Library • Site Prep
MDE-3839	Passport System Installation Addendum	Passport
MDE-4822	Passport Enhanced Dispenser Hub Installation Instructions	<ul style="list-style-type: none"> • Passport • Service Manual
MDE-5083	Passport Hardware Start-up and Service Manual for PX60 Platform	Passport
MDE-5084	Passport V10 Upgrade Instructions	Passport
MDE-5085	Passport Software Installation Manual for V10.00.XX.01 or Later on PX52 Hardware Platforms	Passport
MDE-5086	Passport Software Installation Manual for V10.00.XX.01 on PX60 Hardware Platforms	Passport
MDE-5100	Passport Cashier Workstation Using the RV042 Firewall Router	Passport

Manufacturer's Instructions

Refer to the instructions provided by equipment manufacturers to determine power requirements for their respective products.

Technical Reference Documents

Gilbarco recommends reviewing the following technical reference documents, which contain related information and may be helpful when preparing a site:

Document Number	Title
ANSI/IEEE 142-1991	Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Green Book)
ANSI/IEEE 1100	Recommended Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book)
ANSI/TIA/EIA 568-B.1	Transmission Performance Specification for Field Testing of Unshielded Twisted-pair Cabling Assemblies
ANSI/TIA/EIA 569-A	Commercial Building Standards for Telecommunications Pathways and Spaces (and Amendments)
TIA-568-B.1	Commercial Cabling Standard, Master Document
TIA-568-B.2	Twisted Pair Cabling Components
TIA-568-B.3	Optical Fiber Components Standard
CSA C22.1	Canadian Electrical Code
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Automotive and Marine Service Station Code
NFPA 70®	National Electrical Code (NEC®)

Abbreviations and Acronyms

The following table contains a list of acronyms used in this manual:

Term	Description
ANSI	American National Standards Institute
ASC	Authorized Service Contractor
AWG	American Wire Gauge
CAT	Customer Activated Terminal
CAT-5	Category 5
CoC	Certificate of Conformance
CPC	Competitive Pump and CRIND®
CPU	Central Processing Unit
CRIND	Card Reader in Dispenser
CWS	Cashier Workstation
D-Box	Distribution Box
EDH	Enhanced Dispenser Hub
EIA	Electronics Industries Alliance
EMC	Environmental Management Console
GOLD	Gilbarco Online Documentation
GSM	Gilbarco Security Module
IEEE	Institute of Electrical and Electronics Engineers
J-box	Junction Box
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MOC	Major Oil Company
MWS	Manager Workstation
NEC	National Electrical Code
NFPA	National Fire Protection Association
PAM	Pump Access Module
POS	Point of Sale
PVC	Poly Vinyl Chloride
RF	Radio Frequency
RFI	Radio Frequency Interference
RMS	Root Mean Square
STP	Submersible Turbine Pump
SZR	Secure Zone Router
TIA	Telecommunications Industry Association
TSB	Technical Services Bulletin
UL®	Underwriters Laboratories
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VSAT	Very Small Aperture Terminal

Technical Support

The following table provides a list of technical support numbers:

Information Required	Assistance
To schedule training on Gilbarco products	Contact your local Gilbarco distributor for assistance.
For technical assistance	Contact your local Gilbarco distributor for assistance.
For warranty service and information	Contact the Gilbarco Call Center at 1-800-800-7498.
For an explanation of Gilbarco's warranty policy	Contact your local Gilbarco distributor for assistance.
For additional technical literature, that is, installation, parts manuals, and other documents	Contact the Gilbarco Literature Department at 1-336-547-5661.
To locate a distributor or ASC	Contact the Gilbarco Call Center at 1-800-800-7498.

Using This Manual

The following table provides an overview of the information contained in each section:

Section	Information
"Site Wiring Requirements" on page 3-1	Planning for site power and data line requirements, including: <ul style="list-style-type: none"> • Power distribution requirements such as circuit breaker boxes and emergency cutoff switches. • In some locations, select a line conditioner or Uninterruptible Power Supply (UPS), if the electrical service experiences frequent power disturbances, outages, or lightning strikes. • Data line routing. • Integrated electrical panels. • AC power transient voltage surge suppression.
"Grounding" on page 4-1	Installing, testing, and maintaining an AC safety ground, including: <ul style="list-style-type: none"> • Installing an earth ground electrode system at new sites. • Upgrading existing sites that do not have an earth grounding system or a substandard earth grounding system.
"Power and Grounding Verification" on page 4-3	Guidelines for testing the power and grounding system, including: <ul style="list-style-type: none"> • Verification of the earth grounding system (earth grounding electrodes). • Testing AC wiring and impedance tests.
"Components and Peripherals for POS Systems" on page 5-1	Power requirements for Gilbarco POS equipment.

Read this manual in its entirety before the construction planning stages of a gasoline service facility and before installing the Gilbarco POS system or other peripheral equipment.

- 1 Read all safety information before performing any site preparation procedure.
- 2 Read guidelines presented in the site wiring requirements and system grounding sections.
- 3 Follow the guidelines in the power and grounding verification section to test the electrical system before installing a POS system or other equipment.
- 4 Use the power and grounding verification procedures any time that the equipment is added to a site and test the integrity of the AC power and grounding system.

Perform all site preparation in accordance with NFPA 30A, NFPA 70, and applicable national, state, and local codes/regulations. Plan your site ahead of time. Use experienced, licensed personnel that practice accurate and safe construction techniques. Time, expense, and extra effort in the early stages can avoid later electrical and communication system problems.

2 – Important Safety Information

Notes: 1) Save this Important Safety Information section in a readily accessible location.

2) Although DEF is non-flammable, Diesel is flammable. Therefore, for DEF cabinets that are attached to Diesel dispensers, follow all the notes in this section that pertain to flammable fuels.

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining, or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury, if these safe service procedures are not followed.

Preliminary Precautions

You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.

Emergency Total Electrical Shut-Off

The first and most important information you must know is how to stop all fuel flow to the pump/dispenser and island. Locate the switch or circuit breakers that shut off all power to all fueling equipment, dispensing devices, and Submerged Turbine Pumps (STPs).

⚠ WARNING




The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser. This means that even if you activate these stops, fuel may continue to flow uncontrolled.

You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not the console's ALL STOP and PUMP STOP or similar keys.

Total Electrical Shut-Off Before Access

Any procedure that requires access to electrical components or the electronics of the dispenser requires total electrical shut off of that unit. Understand the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gilbarco equipment.

Evacuating, Barricading and Shutting Off

Any procedure that requires access to the pump/dispenser or STPs requires the following actions:



- An evacuation of all unauthorized persons and vehicles from the work area
- Use of safety tape, cones or barricades at the affected unit(s)
- A total electrical shut-off of the affected unit(s)

Read the Manual

Read, understand and follow this manual and any other labels or related materials supplied with this equipment. Replace with the following information: If you do not understand a procedure, call the Gilbarco Technical Assistance Center (TAC) at 1-800-743-7501. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations

Applicable information is available in National Fire Protection Association (NFPA) 30A; *Code for Motor Fuel Dispensing Facilities and Repair Garages*, NFPA 70; *National Electrical Code (NEC)*, Occupational Safety and Health Administration (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Replacement Parts

Use only genuine Gilbarco replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gilbarco replacement parts could create a safety hazard and violate local regulations.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

Alert Symbol



This safety alert symbol is used in this manual and on warning labels to alert you to a precaution that must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words

These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions below must be followed to prevent death, injury or damage to the equipment:



DANGER: Alerts you to a hazard or unsafe practice which will result in death or serious injury.



WARNING: Alerts you to a hazard or unsafe practice that could result in death or serious injury.



CAUTION with Alert symbol: Designates a hazard or unsafe practice which may result in minor injury.

CAUTION without Alert symbol: Designates a hazard or unsafe practice which may result in property or equipment damage.

Working With Fuels and Electrical Energy

Prevent Explosions and Fires

Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

DEF is non-flammable. Therefore, explosion and fire safety warnings do not apply to DEF fluid lines.

Important Safety Information

No Open Fire



Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

No Sparks - No Smoking



Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuel vapors. Every time you get out of a vehicle, touch the metal of your vehicle, to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/Tagout procedures. If you are not familiar with this requirement, refer to this information in the service manual and OSHA documentation.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Take care that sealing devices and compounds are in place. Ensure that you do not pinch wires when replacing covers. Follow OSHA Lockout/Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth

WARNING

In the event of inclement weather, including snow, ice, or flooding that makes driving conditions dangerous, please avoid servicing units. Always use available door stops to secure upper doors against unwanted/unexpected movement, especially during high winds. If necessary, reschedule service to avoid damage to the equipment. Weather may change unexpectedly; be aware of local weather conditions. During service, if conditions develop making service unsafe, close the unit(s) and proceed to a safe location.

WARNING

The pump/dispenser contains a chemical known to the State of California to cause cancer.

WARNING

The pump/dispenser contains a chemical known to the State of California to cause birth defects or other reproductive harm.



Gilbarco Veeder-Root encourages the recycling of our products. Some products contain electronics, batteries, or other materials that may require special management practices depending on your location. Please refer to your local, state, or country regulations for these requirements.

In an Emergency

Inform Emergency Personnel

Compile the following information and inform emergency personnel:

- Location of accident (for example, address, front/back of building, and so on)
- Nature of accident (for example, possible heart attack, run over by car, burns, and so on)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on)
- Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on)

WARNING



Gasoline/DEF ingested may cause unconsciousness and burns to internal organs. Do not induce vomiting. Keep airway open. Oxygen may be needed at scene. Seek medical advice immediately.

WARNING

DEF generates ammonia gas at higher temperatures. When opening enclosed panels, allow the unit to air out to avoid breathing vapors. If respiratory difficulties develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

WARNING



Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs. Keep airway open. Seek medical advice immediately.

WARNING



Gasoline/DEF spilled in eyes may cause burns to eye tissue. Irrigate eyes with water for approximately 15 minutes. Seek medical advice immediately.

WARNING



Gasoline/DEF spilled on skin may cause burns. Wash area thoroughly with clear water. Seek medical advice immediately.

WARNING

DEF is mildly corrosive. Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location. Seek medical advice/recommended treatment if DEF spills into eyes.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

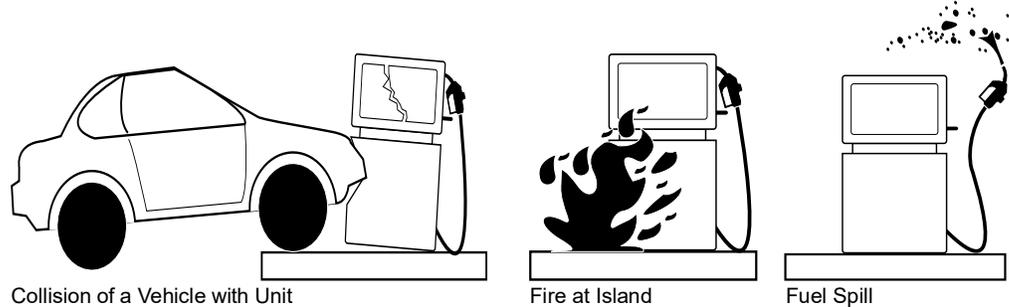
Lockout/Tagout

Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical, or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/Tagout provision for electrical hazards.

Hazards and Actions

 WARNING	
	Spilled fuels, accidents involving pumps/dispensers, or uncontrolled fuel flow create a serious hazard.
	Fire or explosion may result, causing serious injury or death.
	Follow established emergency procedures.
	DEF is non-flammable. However it can create a slip hazard. Clean up spills promptly.

The following actions are recommended regarding these hazards:



- Do not go near a fuel spill or allow anyone else in the area.
- Use station EMERGENCY CUTOFF immediately. Turn off all system circuit breakers to the island(s).
- Do not use console E-STOP, ALL STOP, and PUMP STOP to shut off power. These keys do not remove AC power and do not always stop product flow.
- Take precautions to avoid igniting fuel. Do not allow starting of vehicles in the area. Do not allow open flames, smoking or power tools in the area.
- Do not expose yourself to hazardous conditions such as fire, spilled fuel or exposed wiring.
- Call emergency numbers.

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3 – Site Wiring Requirements

If an AC power distribution system is set up correctly, a Gilbarco POS system will provide many years of reliable service. This section outlines the site requirements for an AC power distribution system. This section is divided into the following subsections:

- “Certificate of Conformance (CoC)” on page 3-1
- “Hazardous Zones” on page 3-1
- “AC Power Distribution Components” on page 3-1
- “AC Power Wiring” on page 3-3
- “Data Line Wiring Requirements” on page 3-9

Note: For more information on AC power distribution, refer to “NFPA 70” and “ANSI/IEEE 1100 Recommended Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book)”.

Certificate of Conformance (CoC)

The wiring personnel must provide the ASC with a copy of the “ANSI/TIA/EIA TSB 67” CoC for all premise wiring before a Passport site can be commissioned. File the certificate with the related documentation at the installation site. A certification of the field test will also be required at equipment start-up. Contact Gilbarco if there are any questions.

Hazardous Zones

All Passport system components are NOT for use over hazardous zones with the exception of the Enhanced Dispenser Hub (EDH), and Distribution Box (D-Box) which can be mounted over hazardous zones.

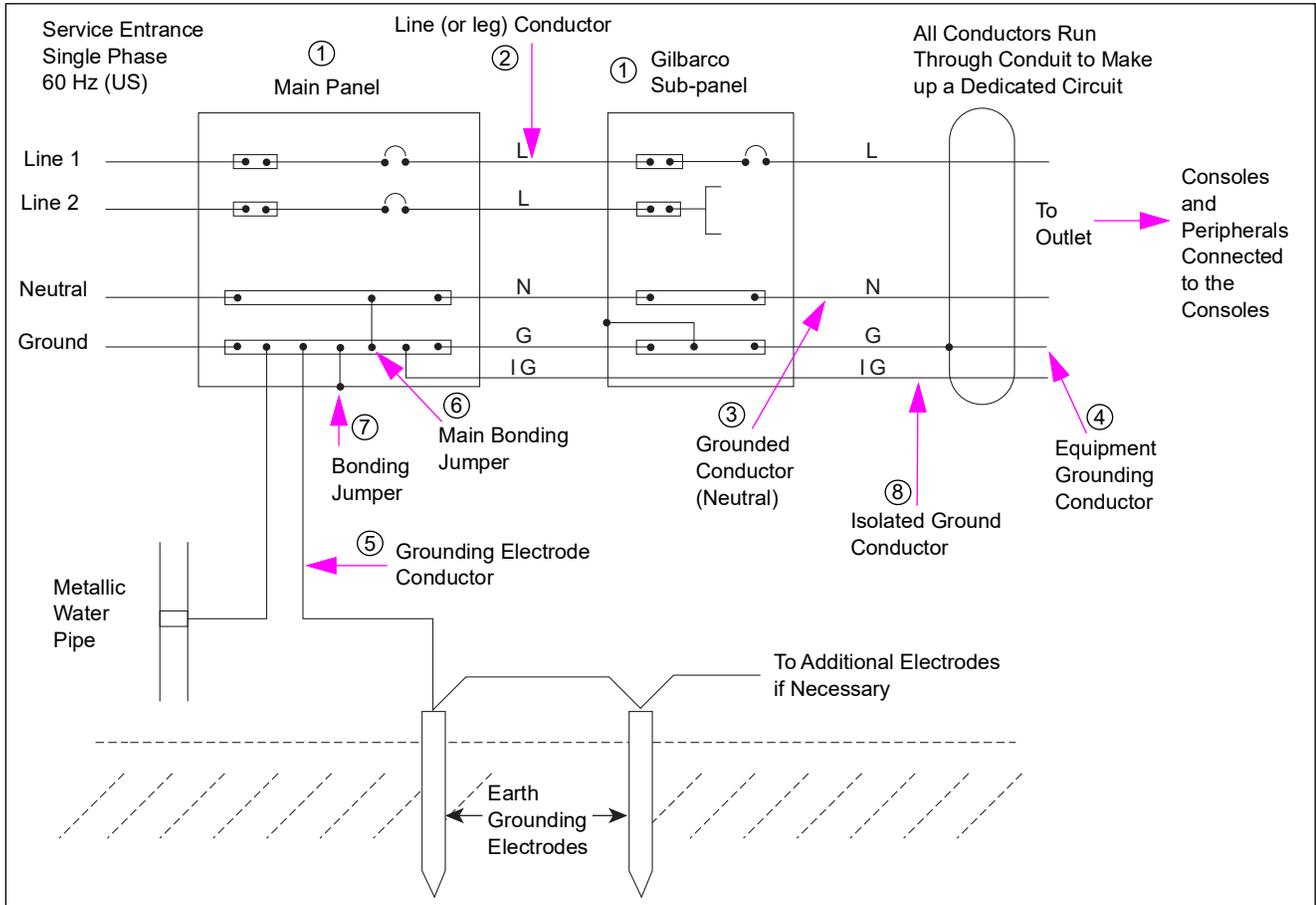
AC Power Distribution Components

The components of the AC power distribution system provide the following:

- Safety - Protect personnel from electrical shock hazards or other potential hazards.
- Reliability - Provide reliable service, including sizing the power source to meet the loads it will supply, properly grounding the system, and over-sizing the system so that it can meet future expansion needs.

Figure 3-1 shows the required components of a grounded power system for Gilbarco POS systems. Refer to the table below for a description of each component.

Figure 3-1: AC Power Distribution Components



Item	Component	Description
1	Main Panel and Sub-panel Breakers	Provides overcurrent protection so that system ground faults do not create a safety hazard to personnel or damage equipment.
2	Line (1 or 2) Conductor	Provides a path for the current from the service entrance to the circuit breaker.
3	Neutral or Grounded Conductor	Provides a path for the current to return to its source.
4	Equipment Grounding Conductor	Provides a safety ground for ground faults by connecting raceways, conduit cabinets, and other non-current-carrying metal parts to the electrode grounding conductor (and the neutral of the power source).
5	Grounding Electrode Conductor	Connects the equipment grounding conductor and non-current-carrying parts of a separately derived power source to the earth ground electrode system. <i>Note: Use only one grounding electrode conductor to connect the earth grounding electrode system to the safety ground at the site's main circuit breaker panel. All electrical circuits at the site requiring a safety ground should connect to the single point ground established at the main circuit breaker panel.</i>
6	Main Bonding Jumper	Connects the grounded circuit conductor (neutral) to the equipment grounding conductor at the main breaker panel.
7	Bonding Jumper	Provides a path for current to flow from electrically connected metal parts to the equipment grounding conductor.
8	Isolated Ground Conductor	Connects sensitive electronic equipment to the ground at the main panel.

AC Power Wiring

This subsection provides information about the following AC power wiring requirements for Gilbarco POS equipment:

- “Circuit Breakers” on page 3-5
- “Conduits” on page 3-5
- “Emergency Cutoff Switches” on page 3-6
- “Integrated Site Panels” on page 3-6
- “Isolated Ground Receptacles” on page 3-7
- “Sub-panels” on page 3-8
- “Miscellaneous Wiring Guidelines” on page 3-8
- “AC Power Transient Voltage Surge Suppression” on page 3-9

IMPORTANT INFORMATION

Only licensed commercial electrical contractors and electricians should install the electrical system and make all connections. The electrical system must be installed in accordance with the NEC, NFPA 70, and other applicable state and local codes or requirements.

Figure 3-2 shows a dedicated circuit box for Gilbarco equipment. The dedicated circuit box is labeled as the Gilbarco breaker panel.

Figure 3-2: Dedicated Circuit Box

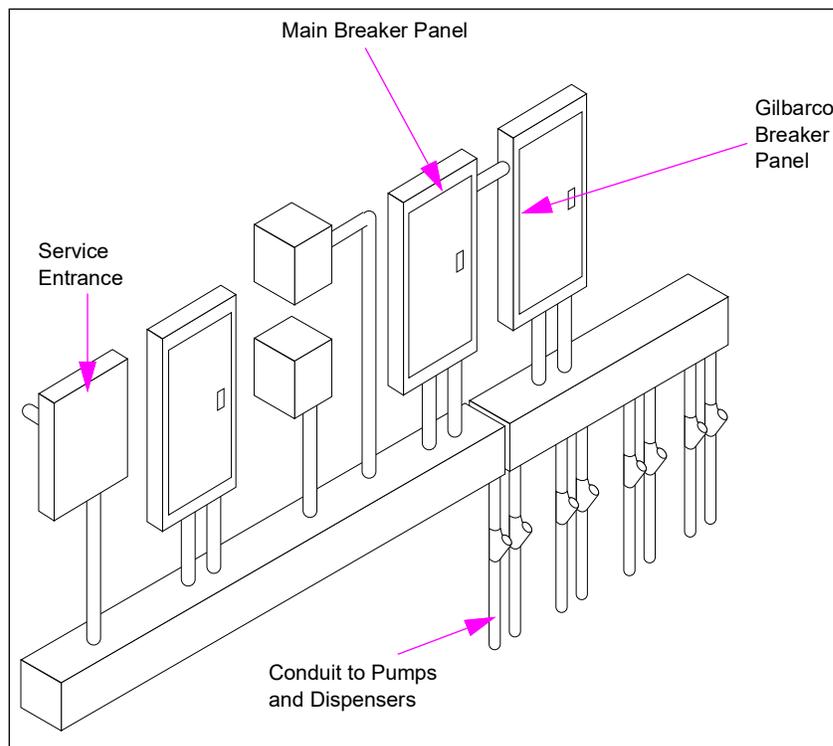
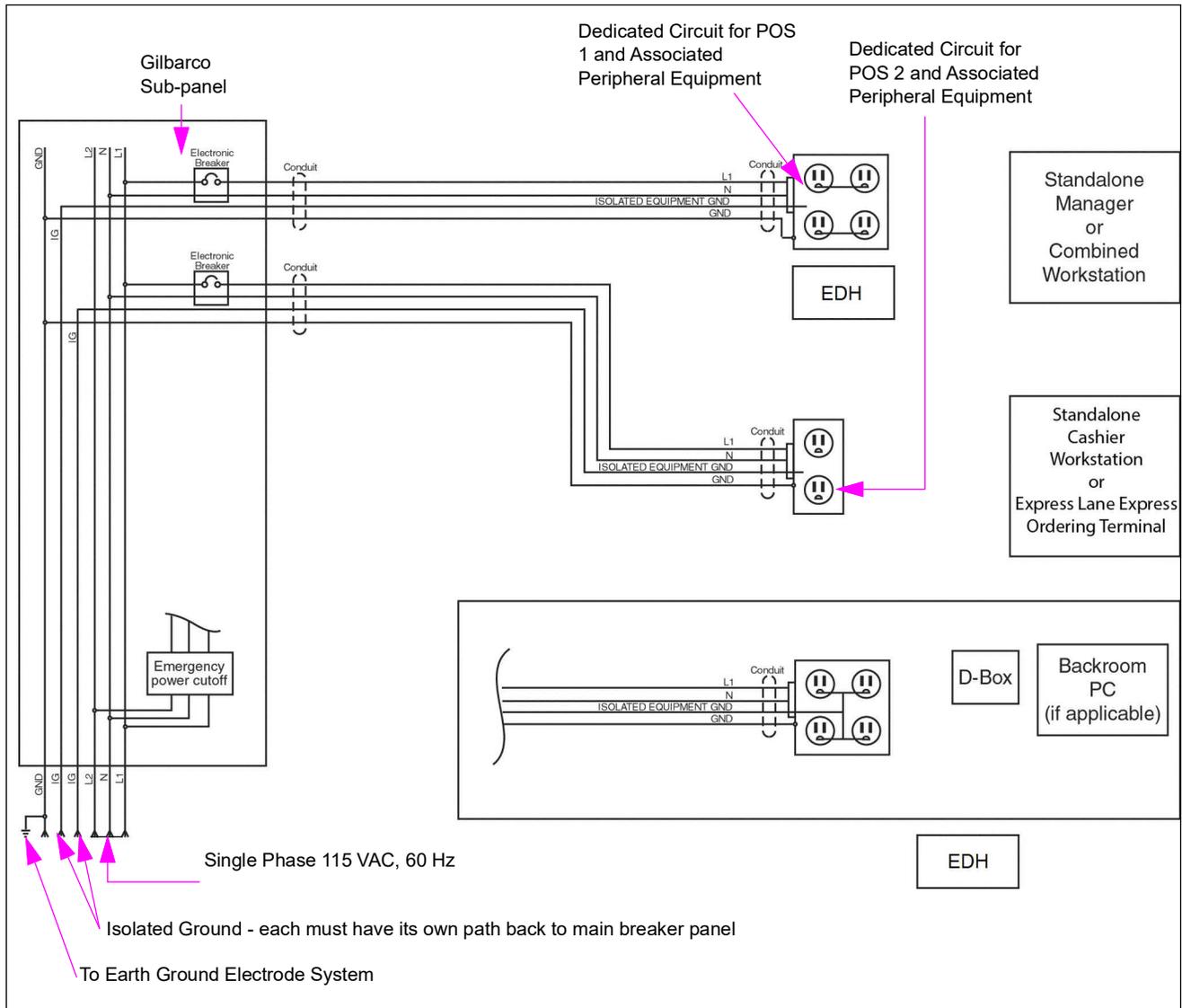


Figure 3-3 shows wiring and dedicated ground for isolated ground receptacles.

Figure 3-3: Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)



Note: Figure 3-3 does not reflect component placement. See Figure 3-4 on page 3-9 for component placement.

Circuit Breakers

The following table provides guidelines for setting up circuit breakers:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

Guideline	Description
Select the appropriate breaker.	Use the appropriate breaker for this site: <ul style="list-style-type: none"> • Single pole - Opens the line conductor. • Double pole (if required by local codes) - Opens both the line and neutral conductors.
Use UL-listed circuit breakers and boxes.	Use only UL-listed circuit breakers (20 Amps maximum) and circuit breaker boxes.

Conduits

The following table provides guidelines for setting up conduits:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

Guideline	Description
Run all AC power wiring for POS equipment through its own conduit.	<p>Noise-generating equipment cannot share the following with Gilbarco equipment and associated peripheral equipment:</p> <ul style="list-style-type: none"> • Conduit • Raceways • Sub-panel • Wiring troughs <p>Isolate Gilbarco equipment and associated peripheral equipment from the following noise-generating devices:</p> <ul style="list-style-type: none"> • Submersible Turbine Pumps (STPs) • Motor devices • Fluorescent lighting • Compressors • Refrigeration units • Utility receptacles • Sources of Radio Frequency Interference (RFI), such as televisions, microwaves, intercoms, and two-way radios <p><i>Note: Two-wire data lines from the D-Box to pumps and dispensers may occupy the same conduit as pump and dispenser AC wiring. Refer to MDE-2833 Pumps and Dispensers Site Preparation manual for more information.</i></p>
Route conduit for all POS power wiring.	<p>Use a rigid metal 3/4-inch conduit.</p> <p>If you choose to use a rigid non-metallic conduit, do not route the conduit near sources of interference, such as the following:</p> <ul style="list-style-type: none"> • Compressor wiring • Fluorescent lights • STPs <p>Additionally, if you choose to use a rigid non-metallic conduit, do <i>not</i> route the conduit in the following places:</p> <ul style="list-style-type: none"> • In walls • Overhead • Underground

Emergency Cutoff Switches

The following table provides guidelines for setting up emergency cut-off switches:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

Guideline	Description
Install emergency power cutoff switches.	NFPA 30A requires the installation of one or more emergency power cutoff switches to cut off power to the following components: <ul style="list-style-type: none"> • D-Box • Pumps and dispensers • Other island equipment <p><i>Note: Refer to the manufacturer’s instructions for information on installing and testing the emergency cutoff switch.</i></p>
Comply with local codes.	Install the emergency cutoff switch in accordance with local codes.
Include power cut off for island kiosk equipment, where applicable.	If the POS equipment is located in an island kiosk, then the emergency cutoff switch must cut off power to that equipment in addition to the pumps, dispensers, and other island equipment.
You may exclude POS equipment from power cut off if it is located inside the building.	Except for the D-Box, the emergency shutoff switch need not cut off power to the POS equipment if it is located inside the building (away from pumps and dispensers).

Integrated Site Panels

The following table provides guidelines for sites using an integrated breaker panel, such as a self-contained prewired main distribution panel:

Guideline	Description
Isolate noise-generating devices from Gilbarco equipment and peripheral equipment wiring.	Isolate the following noise-generating devices from Gilbarco equipment and peripheral equipment wiring: <ul style="list-style-type: none"> • Compressors • Fluorescent lighting • STPs and other motor devices <p>Noise-generating equipment and Gilbarco equipment and peripherals should not share the following components:</p> <ul style="list-style-type: none"> • Conduit • Raceways • Sub-panel • Wiring troughs
Select an appropriate location for STP controllers installed inside the integrated panel.	If you must install STPs and/or variable speed STP controllers inside the integrated panel, perform one of the following procedures: <ul style="list-style-type: none"> • Mount these components near the output of the integrated panel (recommended). • Physically separate STP wiring from Gilbarco POS equipment and peripheral equipment wiring to minimize noise coupling. <p>Follow the manufacturer’s wiring guidelines for shielded wiring. If shielded wiring is used, use the shielded wiring inside the integrated panel.</p>

Isolated Ground Receptacles

The following table provides guidelines for setting up the isolated ground receptacles:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

WARNING

Improperly grounded systems may create shock hazards and system communication problems.

All electrical devices at the site must connect to the same earth grounding system. Multiple earth grounding systems may create shock hazards.

Do not install additional earth grounding electrodes that are not connected to the earth grounding electrode system servicing this site.

Guideline	Description
Connect all electrical devices at the site to the same earth grounding system.	Do not install additional earth grounding electrodes that are not connected to the earth grounding electrode system servicing Gilbarco equipment. Multiple earth grounding systems may create shock hazards and system communication problems.
Install and test a single point earth grounding system before connecting power to the POS AC distribution system.	The grounding electrode to earth impedance must meet the following requirements: <ul style="list-style-type: none"> • Less than 15 Ohms • Complies with the NEC • Complies with any required local codes and regulations. <i>Note: See Figure 3-1 on page 3-2.</i>
Power all POS equipment and peripherals from an isolated ground receptacle.	Each POS being installed requires a dedicated circuit with isolated ground. The following are examples of isolated ground receptacles: <ul style="list-style-type: none"> • Hubbell® IG5261 receptacles • IG5262 receptacles <i>Note: See the following figures:</i> <ul style="list-style-type: none"> • Figure 3-1 on page 3-2 • Figure 3-3 on page 3-4 Also refer to “ AC Ground (Safety/Equipment Ground) Systems ” on page 4-2 for information on providing a dedicated circuit with an isolated ground that is connected to the site’s single point earth ground electrode system or to another single point earth grounding system.
Refer to building and site plan drawings before installing isolated ground receptacles.	Use the building and site plan drawings to determine where to install isolated ground receptacles for Gilbarco POS equipment and peripherals. The following are acceptable outlet types: <ul style="list-style-type: none"> • Simplex • Duplex • Quadplex
Run the isolated ground conductor and a separate equipment grounding conductor through the conduit.	Run the isolated ground conductor through the conduit with the hot and neutral conductors. Run a separate equipment grounding conductor through the conduit with the hot, neutral, and isolated ground conductor. <i>Note: See the following figures:</i> <ul style="list-style-type: none"> • Figure 3-1 on page 3-2 • Figure 3-2 on page 3-3
Connect all receptacles within a Junction Box (J-box) to the isolated ground for that circuit.	Connect all receptacles within a J-box to the isolated ground for that circuit and run them through the conduit with the hot and neutral wires.

Sub-panels

The following table provides guidelines for setting up sub-panels:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

Guideline	Description
Do not use Gilbarco sub-panel to power non-Gilbarco components.	Do not provide power from the Gilbarco sub-panel for the following: <ul style="list-style-type: none"> • General purpose outlets • Lighting • Other noise-generating equipment • Refrigeration equipment
Do not connect the neutral bus to the ground bus in a sub-panel.	See Figure 3-1 on page 3-2 .

Miscellaneous Wiring Guidelines

The following table provides additional guidelines for wiring a POS site:

Note: Refer to “Dedicated Circuit Box” on page 3-3 and “Wiring and Dedicated Ground for Isolated Ground Receptacles (Passport)” on page 3-4.

Guideline	Description
Add dedicated circuits for electronic equipment communicating with POS equipment.	Add dedicated circuits for all electronic equipment that will be communicating to the POS equipment, including the following: <ul style="list-style-type: none"> • Back Office PC • Car Wash controller • Environmental Management Console (EMC)/Tank Monitor™ controller • Line printer • Price sign controller • RS-232 devices
Use a dedicated wiring trough.	Separate other equipment wiring from circuits within the same wiring trough, and place Gilbarco dedicated wiring in its own wiring trough.
Use the same electrical service phase and leg for POS equipment and associated peripherals.	All Gilbarco devices must be on the same service phase and leg to ensure proper communication between devices.
Size the branch circuit.	Have the electrical contractor size the branch circuit by doing the following: <ul style="list-style-type: none"> • Determine the total load of the POS electrical system. • Install an appropriate number of isolated ground receptacles that a circuit breaker can handle. <i>Note: Refer to “Site Wiring Requirements” on page 3-1 and “Components and Peripherals for POS Systems” on page 5-1 for POS and peripheral equipment power requirements.</i>
Use a 10BASE-T cable to connect an Eclipse series to the POS system.	Do not use a CAT-5 cable or a coaxial cable to connect the Eclipse series pumps/dispensers to the POS system. Refer to <i>MDE-3802 Encore and Eclipse Site Preparation Manual</i> for wiring information. Install the Local Area Network (LAN) outlet close enough to the POS minitower to make connection and have slack to be able to pull the minitower in and out for service (within 4 feet).

WARNING

Use only Gilbarco approved 10BASE-T cable as specified in *MDE-3802 Encore and Eclipse Site Preparation Manual*, to connect the Ethernet® versions of Encore and Eclipse to the POS system. Failure to do so will result in erroneous data transfers and possible gas vapor migration leading to explosions.

WARNING

Use only Gilbarco approved 10BASE-T cable as specified in *MDE-3802 Encore and Eclipse Site Preparation Manual* to connect the Ethernet versions of Encore and Eclipse to the POS system. Failure to do so will result in erroneous data transfers and possible gas vapor migration leading to explosions.

AC Power Transient Voltage Surge Suppression

Transient voltage surge suppression systems offer extra protection against power surges. If this system is used, comply with the requirements presented in this manual for specifying and installing the equipment.

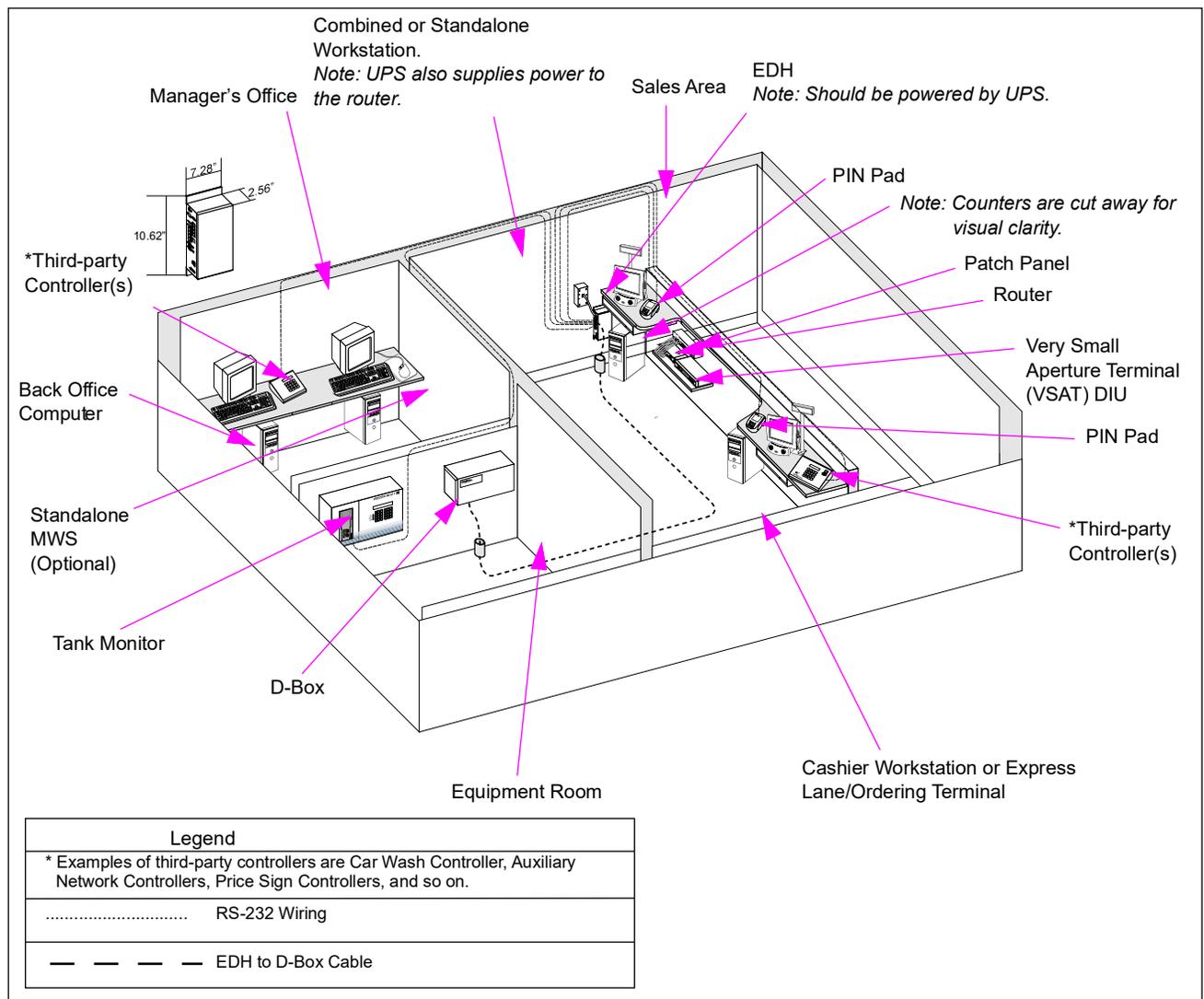
Data Line Wiring Requirements

This subsection provides the data line wiring requirements for POS equipment.

Passport System Express Lane Self-Checkout and Express Order

Figure 3-4 shows an example of a Standalone Manager Workstation (MWS) LAN layout.

Figure 3-4: System LAN Layout



- Notes: 1. [Figure 3-4](#) on [page 3-9](#) is an example only. It is intended as a visual aid to assist in determining where LAN outlets, workstations, and so on, may be located in a store. The layout will vary by location and by the hardware platform that is in use. For example, PX60 systems will not require that workstations be installed below the counter.
2. In [Figure 3-4](#) on [page 3-9](#), CWS 1 = CWS - Passport Cashier Workstation, Express Lane Consumer Workstation, Control Console, or Express Ordering Indoor Kiosk

Guidelines

Guideline	Description
Field test all Passport system work area cabling.	Field test all Passport system work area cabling to ensure that it meets applicable testing requirements per "ANSI/TIA/EIA 568-B.1 Transmission Performance Specification for Field Testing of Unshielded Twisted-pair Cabling Assemblies".
Do not cut Q13850-06 work area cables.	Do not rework Q13850-06 cables in the field. Ensure that LAN outlets are installed within 6 feet of the device to which the cable will be connected.
Do not use Q13482-XX series cables for work area cables.	Q13482-XX series cables will degrade the 10BASE-T LAN performance.
Comply with the Commercial Building Telecommunication Cabling Standards.	Install the Passport system work area wiring in accordance with "ANSI/TIA/EIA 568-B.1 Commercial Building Telecommunication Cabling Standards (and Amendments)" and "ANSI/TIA/EIA 569-A Commercial Building Standards for Telecommunications Pathways and Spaces (and Amendments)".
Install the Passport system LAN hub/router within 2 feet of the site patch panel.	Refer to " System LAN Layout " on page 3-9 .
Install the Passport system LAN hub/router within 2 feet of the site UPS.	Refer to " System LAN Layout " on page 3-9 .
Do not install surge suppression devices with two-wire communication data lines.	N/A
Use twisted-pair data wires correctly.	Twisted-pair (two-wire), field installed data wires should be 10 to 12 twists per feet of wire. Use twisted-pair wires for two-wire data lines in areas with frequent lightning strikes.
LAN outlet location	The LAN outlets should be placed within 4 feet of each LAN device (Server, Client, EDH, and so on) that connect to the LAN.
LAN hub/router location	The LAN hub/router should be within 6 feet of the server or combined workstation so that power can be supplied to the LAN hub by the server UPS. The LAN hub should be within 2 feet of the patch panel.
Use wiring ducts (raceways) to protect data cabling between system components.	Run cables from the backroom equipment to the cashier counter through a conduit [or Poly Vinyl Chloride (PVC) pipe]. If using a non-metallic conduit, refer to the guidelines under " Conduits " on page 3-5 .

PAM Systems and Passport

The following table provides data line wiring guidelines for the following systems:

- PAM system
- Passport

Guideline	Description
Do not cut Q13482-XX or Q13850-XX cables.	Many different lengths are available. If the cable included with Gilbarco equipment or peripherals is too long, order a shorter cable. Do not coil excess length cables.
Do not install surge suppression devices with two-wire communication data lines.	N/A
Use twisted-pair data wires correctly	Twisted-pair (two-wire), field installed data wires should be 10 to 12 twists per foot of wire. Use twisted-pair wires for two-wire data lines in areas with frequent lightning strikes.
Use wiring ducts (raceways) to protect data cabling between system components.	Run cables from the backroom equipment to the cashier counter through a conduit (or PVC pipe). If using a non-metallic conduit, refer to the guidelines under " Conduits " on page 3-5 .

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4 – Grounding

This section provides guidelines for safe grounding practices for Gilbarco POS systems.

Importance of Grounding

Proper grounding prevents console problems and reduces downtime. A complete and properly grounded electrical system is vital for personnel safety, protecting equipment, and assuring normal system operation.

Note: Refer to “ANSI/IEEE 142-1991 Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Green Book)” for more information.

Single Point Grounding System Required

The entire service station electrical system requires a single point grounding system.

Earth Ground Systems

Earth ground is a low impedance path to earth for draining static electricity, lightning, and radiated energy. Earth ground establishes the main service entrance, and the building safety grounds at the service entrance, and provides a place to bond safety grounds. A safety ground provides a current path to the branch circuit breaker during an electrical fault and eliminates shock hazards by maintaining equipment enclosures at earth potential.

Note: This document provides a general description of grounding electrode systems. Soil conditions and acceptable grounding practices differ throughout the world.

Responsibilities of the Electrical Contractor

The electrical contractor must ensure that a grounding electrode system exists at the service station site where the POS system is being installed. The grounding electrode system must also meet local building and wiring codes.

Earth Ground System Components

There are two parts to an earth ground system:

- Earth ground electrode - Contacts with the earth outside the building.
- Grounding electrode conductor - Connects the earth ground electrode to the building's electrical system.

Single Point Earth Ground System

Use a single point earth ground system for the entire site. All electrical devices at the site must connect to the same earth grounding system. If additional earth grounding electrodes (rods) are required at a site (to meet NFPA 70 and local codes), the additional electrodes must be bonded to each other and connected to the main panel by a single appropriately sized grounding electrode conductor. The grounding electrode to earth impedance must meet the NEC and any required local codes or regulations.

Typical Earth Ground Electrode System

Typical earth ground electrode systems consist of one or more 3/4-inch diameter copper rods. The copper rods are driven into the earth outside the building. The number of rods needed and depth driven at any building site will vary.

The impedance between the earth and electrode must meet the impedance specified in NFPA 70 and conform to local codes and regulations. If an electrode does not meet the required impedance of 15 Ohms or less, install additional rods at a minimum of 8 feet apart and bond them with an un-insulated copper cable to the primary ground.

Factors Affecting Earth to Electrode Impedance

Factors that affect earth to electrode impedance are:

- Climate
- Soil conditions
- Water table

Note: Soil treatment may be necessary in some locations to make the earth more conductive.

Connecting the Electrode to the Electrical System

Always use a proper size grounding electrode conductor cable. Refer to NFPA 70 for specific requirements. To avoid problems with connections adding resistance or loosening, exothermically weld the electrode grounding conductor to the electrode. Vibration, corrosion, and differing expansion rates of unlike metals (clamp, electrode, and conductor) as soil temperatures change can degrade clamped connections.

Testing Electrode Impedance

Test the impedance of an electrode system during the installation of the system and whenever electrical system modifications are made. Electrode systems can degrade through normal use for various reasons. Lightning strikes or fault currents can cause pitting in the soil, rendering it less conductive. Changing temperatures, moisture, and soil chemistry also affects impedance.

AC Ground (Safety/Equipment Ground) Systems

The AC ground (safety ground) or equipment grounding conductor maintains a low impedance path for ground fault currents from the load to the circuit breaker at the service entrance. A low impedance path for fault current does not exist if only the hot and neutral conductors run from the power source (circuit breaker) to the load.

Responsibilities of General and Electrical Contractors

General and electrical contractors are responsible for ensuring that the AC grounding system meets the following requirements:

- All metal conduits are effectively grounded.
- Meets or exceeds local regulations.
- Protects operation and service personnel from shock hazards.
- Installed in accordance with NFPA 70 Article 250.
- AC ground (equipment grounding) conductor runs through the same conduit as the hot and neutral conductors from the power source to the load (isolated ground receptacle). Refer to [“AC Power Wiring”](#) on [page 3-3](#).

The general and electrical contractor should also refer to NFPA 70 to size the grounding conductor to the amperage of the circuit breaker correctly. Typically, a 20 Amp circuit breaker requires a minimum of 12 American Wire Gauge (AWG) grounding wire.

WARNING

Connecting the ground terminal of an AC receptacle (load) directly to a grounding electrode creates a condition that could restrict fault current from opening the circuit breaker in the event of a hot conductor to equipment cabinet fault. This condition creates a shock hazard to personnel operating the equipment.

System Testing

As faults may exist when the AC distribution system and grounding system are installed, the installer must test and verify the AC power distribution system and the grounding system at the time of installation and before applying power to any POS system equipment.

Refer to [“Power and Grounding Verification”](#) for guidelines on how to test the AC distribution system and grounding system. Correct any problems found with the systems before applying power to any POS system equipment.

Power and Grounding Verification

This section contains guidelines for verifying if the AC power distribution and grounding system is properly installed. You must verify the power distribution and grounding system before installing and starting up the POS system.

Test Equipment

To test the system and develop meaningful data, proper test equipment must be used. You must understand the test equipment you will be required to use to test AC power distribution and system grounding at a site. Common examples of misunderstandings in the use of test equipment are using an ohmmeter to measure impedance, or using an averaging ammeter to measure switching power supply load currents. Refer to the instructions included with the test equipment for more information about that piece of equipment.

Required Test Equipment

The following table provides a list of required test equipment:

Test Equipment	Function
Ground resistance tester	Measures ground rod and small grid resistance (electrode testing device).
Impedance tester	Measures the 60 Hz impedance of neutral conductors and equipment grounding conductors.
Megger® tester	Checks insulation of individual wires.
True Root Mean Square (RMS) ammeter	Provides accurate current measurements over a wide range of current waveforms.
True RMS multimeter	Provides accurate voltage measurements over a wide range of voltage waveforms to ensure a good RF ground.
Wiring tester	Detects the following: <ul style="list-style-type: none"> • Absence of isolated ground shorts • Absence of neutral-to-ground shorts • Correctness of wiring • Neutral-to-ground reversals

Testing

Conduct all tests during installation and prior to system start-up.

Verifying Earth Grounding Electrodes

Always test a newly installed earth grounding electrode system before placing it in service. Existing electrode grounding systems should be checked on a yearly basis. Systems can be tested under power using a clamp-on type electrode testing device.

WARNING

Do not open the connection between the service neutral bus and earth ground electrode while the system is powered. Opening the connection creates immediate danger of electrocution and system failure.

Measurements

Another test of the earth grounding system is to check AC voltage and current readings. The following table shows the appropriate measurements for potentials:

Potential	Measurement
Normal hot to neutral	120 VAC
Hot line to ground	120 VAC
Neutral to ground	0

Use a clamp-on ammeter to verify the AC distribution system and grounding. System faults can be detected by observing relationships of current measurements with other various measurements.

Measuring Current in an Electrode

It is impossible to predict the exact value to expect when measuring current in an electrode.

The following conditions are cause for further investigation:

- No current flow at an electrode could result from a high impedance at the electrode or a loose or broken connection to the service entrance.
- No building will be completely free of fault current. Ground current through a ground electrode in the range of one percent of the building service is normal (for example, 3 A of ground current for 300 A service).
- The ground current at the service entrance and through the grounding electrode should be the same.
- If there are ground connections to water pipes or structural steel, take current readings for these at the service entrance panel. If they show more current flow than the main electrode connection, the electrode grounding system may not be effective.

If an electrode does not meet the required impedance of 15 Ohms or less, install additional rods a minimum of 8 feet apart and bond them to each other with an un-insulated copper cable to the primary ground.

AC Wiring Tests

Verify the wiring of all AC receptacles. Use a wiring tester as listed in [“Test Equipment”](#) on [page 4-3](#). Correct any wiring errors before installing Gilbarco POS systems or any components.

To test the AC wiring, proceed as follows:

- 1 Plug the wiring tester into each isolated ground receptacle that supplies power to a POS system component.
- 2 Check the lamps on the wiring tester to verify the correctness of wiring.
- 3 Check all other AC outlets (for example, appliances and utility outlets) for correctness of wiring. All receptacles within a common J-box must be connected to the AC safety ground.

Impedance Test

The impedance test measures the 60 Hz impedance of the equipment grounding conductor and neutral conductor. The impedance of the equipment grounding conductor is important because it assures personnel safety.

Use an impedance tester like the one listed in “[Test Equipment](#)” on [page 4-3](#). Verify if the impedance of the equipment grounding conductor and neutral conductor to all isolated ground receptacles meets or exceeds the requirements specified by NFPA 70 and local codes and regulations. Higher impedances are usually the result of loose connections in the receptacle or circuit breaker panel.

Testing Grounding Conductor Impedance

To test the equipment grounding conductor impedance, proceed as follows:

- 1 Plug the impedance tester into a receptacle to be tested.
- 2 Read the impedance of the equipment grounding conductor and neutral conductor.
- 3 Verify if the impedance meets or exceeds the national and local electrical codes.
- 4 Repeat this procedure for all receptacles.

5 – Components and Peripherals for POS Systems

Passport System

The table below lists the Passport system equipment for each workstation.

Note: An “X” in the columns indicates that the component is a standard or optional part of the respective workstation.

Component/Peripheral	Part Number	Cashier Workstation	Combined CWS/MWS	Standalone MWS	Edge Manager Workstation	Express Lane Workstation	Express Ordering Indoor Kiosk
Cash Drawer	PA01570080	X	X	-	-	-	-
Client	PA0324PC6X	X	-	-		X	X
Customer Display	PA03270400	X	X	-	-	X	X
D-Box	PA03060020	-	X	X	X	X	X
D-Box (CPC Tokheim®)	PA03380001	-	X	X	X	X	X
D-Box (CPC Wayne®)	PA03380000	-	X	X	X	X	X
EDH2	PA041900XXXX	-	X	X	X	X	X
EDH2C	PA04360000VXXXX	-	X	X	X	X	X
Monitor, Color, 9.7-inch Liquid Crystal Display (LCD)	PA03390800	-	-	-	X	-	-
Secure Zone Router (SZR)	PA04240000	-	X	X	X	-	-
PIN Pad with Card Reader	PA0412000XXXX OR PA0421000XXXX	X	X	-	X	X	X
Express Lane MX915 Mounting Arm	M09219B041	-	-	-	-	X	-
Receipt Printer (Thermal)	PA04060013 OR PA04270013 OR PA04300043	X	X	X	-	-	X
Express Lane Base (with Printer Garage)	M09219B040	-	-	-	X	-	-

Component/Peripheral	Part Number	Cashier Workstation	Combined CWS/MWS	Standalone MWS	Edge Manager Workstation	Express Lane Workstation	Express Ordering Indoor Kiosk
Report Printer, Light Emitting Diode (LED)	PA03400008	-	X	X	X	-	-
Scanner	PA02710403	X	X	-	-	-	-
	PA02710303	X	X	-	-	-	-
	PA02710513A	X	X	-	X	-	X
	PA02710603	-	-	-	-	X	-
Server	PA0324PS6X	-	-	X	-	X	-
	PA0324PS65x	-	-	-	X	-	-
	PA0324PB6X	-	X	-	-	X	-
USB RS-232 Converter (PX60 1-port)	M01700B104B	X	X	X	X	X	X
UPS 550 VA	PA03310004	X	X	X	X	X	X

6 – Hardware Specifications: System Components

This section includes POS equipment power requirement information. This information is provided to help the electrical contractor determine how to configure and install the isolated ground receptacles with respect to the dedicated Gilbarco circuit breaker box.

Passport System

Hazardous Zones

All Passport system components are not for use over hazardous zones with the exception of the EDH, D-Box, and PX52 minitowers, which can be mounted over hazardous zones.

Component	Model Number	Dimensions (Inches)				Power Cord (Ft.)	Environmental			Electrical			
		Width	Height	Depth	Weight (Lbs.)		Operating Temp.	Storage Temp.	Humidity ⁴ (%)	Voltage	Power (W)	Current (Amps at 115 VAC)	Frequency (Hz)
Cash Drawer	PA01570080	18	4-3/16	16-3/4	12	6	-7 to 37 °C (19 to 99 °F)	-17 to 50 °C (1 to 122 °F)	20% to 80%	+12 VDC and -12 VDC (24 VDC) regulated from a Class 2 power source	N/A ²	N/A	N/A
Client	PA0324PX68	15	13.3	10.5	21	6	0 to +55 °C (32 to +140 °F)	0 to +55 °C (32 to +140 °F)	5% to 95%	100 to 240 VAC	180	1.6	50/60
Client	PA0324PC60	15	13.3	10.5	23	6	5 to 50 °C (41 to 131 °F)	-20 to 55 °C (-4 to 140 °F)	20% to 80%	100 to 240 VAC	140	1.4	50/60
Customer Display	PA03270203A	8-7/16	21-11/16	2-1/8	3	6-1/2	0 to 70 °C (32 to 155 °F)	-20 to 70 °C (-4 to 158 °F)	0% to 95%	120 VAC	15	0.13	60
	PA03270400	8-7/16	17.8	3-1/2	3	6	5 to 50 °C (41 to 131 °F)	-20 to 55 °C (-4 to 140 °F)	0% to 95%	100-240VAC	12	0.5	50/60
D-Box	PA03060020 OR PA0338XXXX	16-5/16	7-13/16	5-1/2	5	6	0 to 55 °C (32 to 131 °F)	0 to 55 °C (32 to 131 °F)	5% to 95%	USA/Canada - 115 VAC International - 230 VAC	60	0.5	50/60
EDH	PA040300XXX	10-4/10	3	6-7/10	6		0 to 55 °C (32 to 131 °F)	0 to 55 °C (32 to 131 °F)	5% to 95%	100 to 240 VAC	149	1.44	50/60

Component	Model Number	Dimensions (Inches)				Power Cord (Ft.)	Environmental			Electrical			
		Width	Height	Depth	Weight (Lbs.)		Operating Temp.	Storage Temp.	Humidity ⁴ (%)	Voltage	Power (W)	Current (Amps at 115 VAC)	Frequency (Hz)
EDH2	PA041900XXX	15	3	8-1/4	11.2		0 to 55 °C (32 to 131 °F)	0 to 55 °C (32 to 131 °F)	5% to 95%	100-240VAC	120	2	50/60
EDH2C	PA04360000VXXXX	15	3	8-1/4	7.6		0 to 55 °C (32 to 131 °F)	0 to 55 °C (32 to 131 °F)	5% to 95%	100-240VAC	120	2	50/60
Gilbarco Security Module (GSM)	PA0258XXXXXXXX	6	1-1/2	9	5.5	12	0 to 55 °C (32 to 131 °F)	0 to 55 °C (32 to 131 °F)	5% to 95%	5 VDC regulated from a Class 2 power source	30	0.3	50/60
Keyboard	Q13181-05X	18	2-1/2	7-1/4	3	6 ¹	5 to 50 °C (41 to 122 °F)	4 to 60 °C (40 to 140 °F)	95%	5 VDC regulated from a Class 2 power source	N/A ³	N/A	N/A
LAN Hub	Q13708-01	8-1/2	1-3/4	6-1/2	1.12	5	5 to 50 °C (41 to 122 °F)	4 to 60 °C (40 to 140 °F)	95%	120 VAC	15	0.125mA	60
Mouse, PS/2	Q13724-02	2-1/2	1-5/8	4-1/2	0.3	6 ¹	5 to 50 °C (41 to 122 °F)	4 to 60 °C (40 to 140 °F)	95%	5 VDC regulated from a Class 2 power source	N/A ³	N/A	N/A
Switch	Q13708-09	6.2	8.25	1.1	1	6	0 to 40 °C	0 to 40 °C	0% to 95%	12 VDC from a Class 2 transformer	NA	0.31A	50/60
Server	PA0324PB60	15	13.3	10.5	23	6	5 to 50 °C (41 to 131 °F)	-20 to 55 °C (-4 to 140 °F)	20% to 80%	100 to 240 VAC	140	1.4A	50/60
	PA0324PB68	15	13.3	10.5	21	6	0 to +55 °C (32 to 131 °F)	0 to +55 °C (32 to 131 °F)	5% to 95%	100 to 240 VAC	180	1.6A	50/60
	PA0324PS65	8.7	5.4	1.4	2.6	6	0-40°C (32 to 104 °F)	0-40°C (32 to 104 °F)	0-95%	100-240 VAC	N/A	1.5A	50/60
UPS	PA03310004	3-1/2	7	12	14.3	6	0 to 40 °C (32 to 104 °F)	-15 to 45 °C (5 to 113 °F)	0% to 95%	92 to 147 VAC	N/A	7	50/60
USB-RS-232 Converter (1-port)	M01700B104B	2-1/4	3	1	1	3	0 to 55 °C (32 to 131 °F)	-30 to 55 °C (-22 to 131 °F)	0% to 95%	5 VDC	2.5	N/A	N/A ³
USB-RS-232 Converter (8-port)	M01700B103	7-1/4	1-3/4	4-3/8	.25	N/A	0 to 55 °C (32 to 131 °F)	-30 to 55 °C (-22 to 131 °F)	0% to 95%	5 VDC	25	N/A	N/A
Secure Zone Router	PA0424000x	6.2	8.25	1.4	1.3	6	0 to 40 °C	0 to 40 °C	0% to 95%	12 VDC from a Class 2 transformer	N/A	0.31A	50/60

Notes:
 1 Power cord also includes an 18-inch coiled extension.
 2 Provided by printer.

3 Provided by minitower.
 4 Relative; non-condensing.

7 – Hardware Specifications: Peripherals

Passport System

Peripheral	Model Number	Dimensions (Inches)				Weight (Lbs.)	Power Cord (Ft.)	Environmental			Electrical		
		Width	Height	Depth	Operating Temp.			Storage Temp.	Humidity ⁶ (%)	Voltage	Power (W)	Current (A)	Frequency (Hz)
Modem Multi-Tech V.90/K56flex,	PA02960009	5	1-1/5	7	2	6	0 to 50 °C (32 to 122 °F)	-40 to 70 °C (-40 to 158 °F)	5% to 95%	115 VAC ±10%	10	150 mA	50/60
Monitor, Touch Screen, 15-inch	PA03440104	13.75	11	6	6.5		5 to 35 °C (41 to 95 °F)	-20 to 60 °C (-4 to 140 °F)	20% to 80%	100 to 240 VAC	140	1.4	50/60
Monitor, 9.7-inch LCD	PA03390800	9.7-7/ 16	16	7-11/16	11.2	5	0 to 40 °C (32 to 104 °F)	-10 to 65 °C (14 to 149 °F)	5% to 95%	100 to 240 VAC	100	1.0	50/60
PIN Pad MX-915	PA0421x	5	2	6-3/8	1.1	6	0 to 40 °C (32 to 104 °F)	-18 to 66 °C (0 to 150 °F)	15% to 90%	120 VAC	18	150 mA	60
PIN Pad iSC250	PA0412000XXX	6-3/4	6-1/4	2	0.5	6	0 to 40 °C (32 to 104 °F)	-18 to 66 °C (0 to 150 °F)	15% to 90%	120 VAC	18	150 mA	60
Printer Digital LED OKIPAGE 4300/4350/ 4600 OKI® Data	PA03400003 PA034000X4 PA034000X5 PA034000X7 PA03400008	14	8-1/2	15-3/5	22.0	6	0 to 40 °C (32 to 104 °F)	-10 to 50 °C (14 to 122 °F)	5% to 95%	120 VAC +5.5% to 15% 230 VAC ± 10%	340 ⁸ 110 - 127 V	4.0 6	50/60 30/60
Report Printer Laser Brother HL-L2370DW	PA03400008	17.2	11.2	20.4	15.9		10 to 32°C (50 to 89.6 °F)	0 to 40 °C (32 to 104 °F)	20%-80%	110 to 120VAC	1104	9.5	50/60
Printer Thermal Receipt Epson Model TM-T88	PA040600X3	5-3/4	5-13/16	7-11/16	2.21	5 to 8	0 to 50 °C (32 to 122 °F)	-40 to 65 °C (-40 to 149 °F)	0% to 95%	100 to 240 VAC to external power supply	47 max. 1.7 stand-by	1.8	50/60
Printer Thermal Receipt Epson® Model TM-T70II	PA04270013	5-3/4	5-13/16	7-11/16	2.21	5 to 8	0 to 50 °C (32 to 122 °F)	-40 to 65 °C (-40 to 149 °F)	0% to 95%	100 to 240 VAC to external power supply	47 max. 1.7 stand-by	1.8	50/60
Scanner, Honeywell® Fusion	PA02710403	2-1/2	8-1/2	5-1/8	0.4	5	-20 to 40 °C (-4 to 104 °F)	-40 to 60 °C (-40 to 140 °F)	5% to 95%	120 VAC (input) 5 VDC (output)	1.375	650 mA	60
Scanner, Honeywell Genisys	PA02710603	3.3	5.9	3.2	12	7	0 to 40 °C (32 to 104 °F)	-40 to 60°C (-40 to 140 °F)	0%-95%	120 VAC (input) 5 VDC (output)		190 mA	60

Peripheral	Model Number	Dimensions (Inches)				Environmental				Electrical			
		Width	Height	Depth	Weight (Lbs.)	Power Cord (Ft.)	Operating Temp.	Storage Temp.	Humidity ^s (%)	Voltage	Power (W)	Current (A)	Frequency (Hz)
M400 Pin Pad	PA04640000XXXX	6.8	6.1	1.7	1.3	6	0 to +40 °C (32 to 104 °F)	0 to +40 °C (32 to 104 °F)	15% to 95%	12 to 24 VDC	12	350 mA	60
P400 PIN Pad	PA04650000XXXX M18906	6.5	3.1	1.7	0.95	6	0 to +50 °C (32 to 122 °F)	0 to +50 °C (32 to 122 °F)	15% to 95%	12 to 24 VDC	12	350 mA	60
Scanner, Orbit	PA02710303	4	5.9	4.1	41.5 oz	7	0 to 40 °C (32 to 104 °F)	-40 to 65 °C (-40 to 149 °F)		120 VAC (input) 5 VDC (output)	1.375	180 mA	60
Scanner, Honeywell Xenon 1900 with Age Verification	PA02710513A	6-1/2	4-1/4	2-3/4	7.5 oz	7	0 to 40 °C (32 to 104 °F)	-40 to 65 °C (-40 to 149 °F)		120 VAC (input) 5 VDC (output)	1.375	180 mA	60

- Notes:
- 1 Signal cable = 3-1/2 feet
 - 2 Signal cable = 5- and 6-foot extension (included)
 - 3 With Journal take-up
 - 4 Does not include the printer platen knob.
 - 5 Retracted coil cord
 - 6 Relative; non-condensing
 - 7 Power is provided to this device by the Central Processing Unit (CPU).
 - 8 Printing wattage: Idle 75 W; Peak 600 W
 - 9 Idle wattage 6 W
 - 10 Idle wattage 10 W
 - 11 Idle wattage 13 W
 - 12 Storage temperature 5 to 95%
 - 13 Non-operating 150 mA

8 – Monitor Resolution Setting

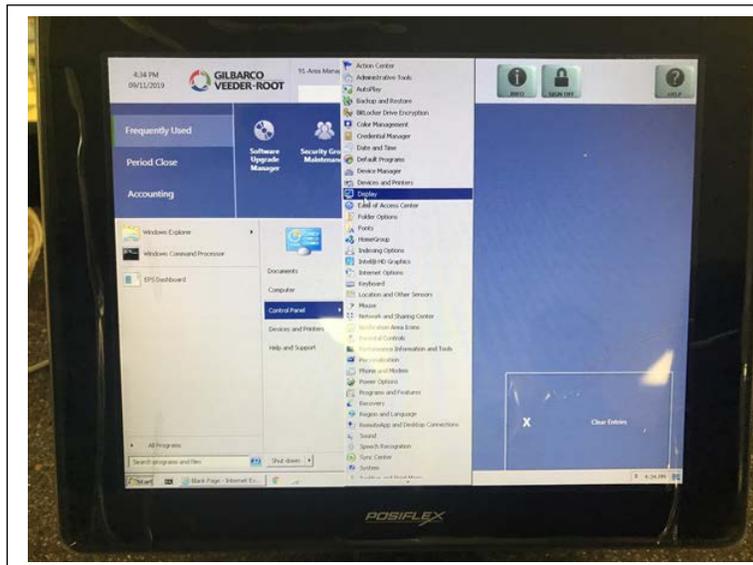
This section includes information about setting up the monitor resolution.

Setting Monitor Resolution

To set monitor resolution, proceed as follows:

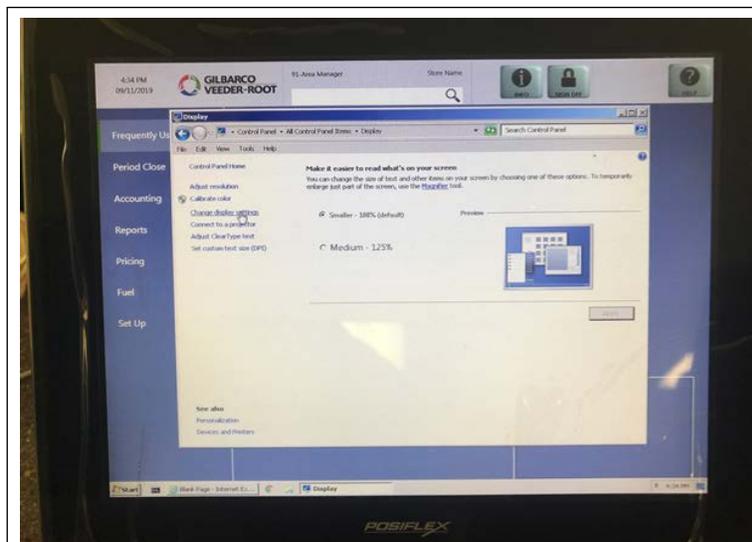
- 1 Go to **Control Panel > Display**.

Figure 8-1: Display Setting Screen



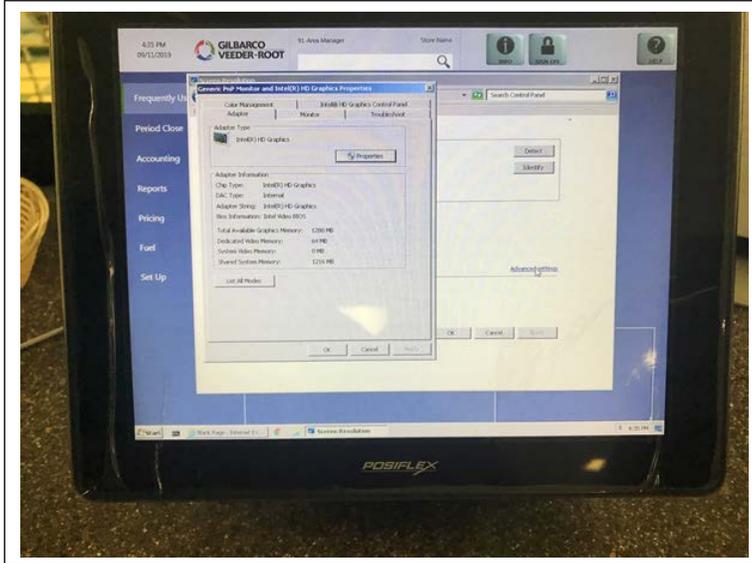
- 2 Select **Change display settings**. The Screen Resolution screen opens.

Figure 8-2: Change Display Settings Screen



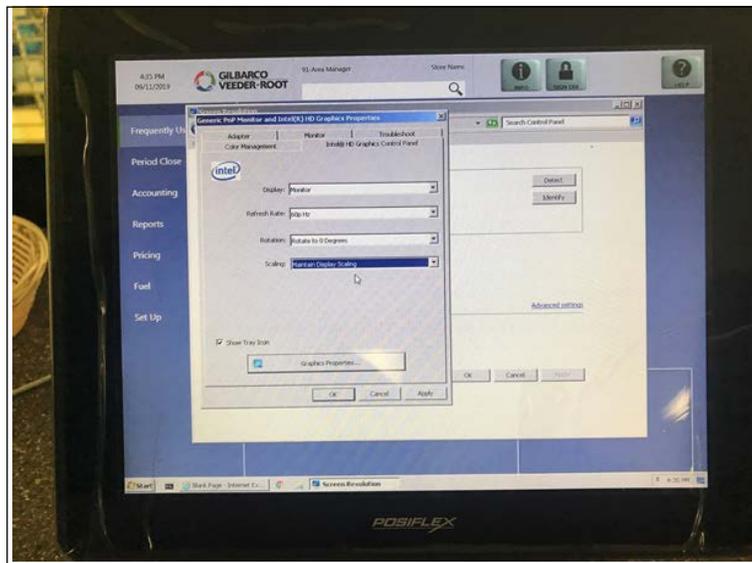
- 3 Select **Advanced Settings**. On clicking, the Generic PnP Monitor and Intel (R) HD Graphics Properties window opens.

Figure 8-3: Advanced settings Window



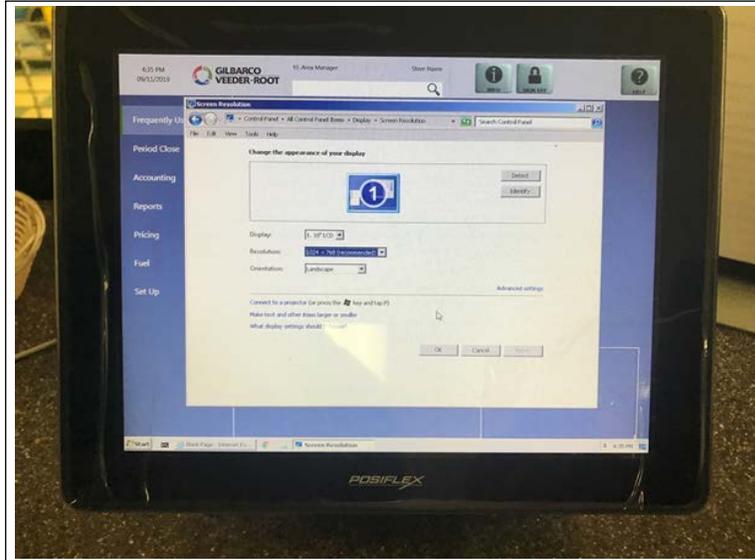
- 4 Navigate to **Intel® HD Graphics Control Panel** tab.
- 5 Select the **Maintain Display Scaling** option from the Scaling drop-down list and click **Apply**.

Figure 8-4: Scaling



The following screen is displayed after applying the settings.

Figure 8-5: Resolution Setting Screen



- 6 Click **OK**.

The resolution setting procedure is now complete. You can now resume Passport routine work.

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Index

A

AC Ground 4-2
 AC power 1-4, 3-1, 3-3, 4-3
 AC wiring 3-5
 AC Wiring Tests 4-5

C

Call Center 1-4
 CAT-5 3-8
 circuit breaker box 6-1
 circuit breaker boxes 3-5
 Circuit breakers 3-5
 circuit breakers 3-5
 clamp-on 4-4
 Client 5-1
 Components 5-1
 Compressors 3-5
 Conduit 3-6
 Conduits 3-5
 conduits 3-5

D

Data Line Wiring Requirements 3-9
 D-Box 3-1, 3-5, 3-6, 6-1
 Dedicated Ground 3-4
 Duplex 3-7

E

Earth Ground System Components 4-1
 Earth Ground Systems 4-1
 EDH 3-1, 6-1
 Electrical System 4-2
 Electrode 4-2
 EMC 3-8
 Emergency
 Personnel (contacting) 2-2
 Emergency Cutoff Switches 3-6
 emergency cutoff switches 3-6

F

Factors Affecting Earth 4-2
 Fluorescent 3-5, 3-6

G

Grounding 4-1

H

Hubbell 3-7

I

IEEE Green Book 4-1
 IG5262 3-7
 Impedance Test 4-6
 Importance of Grounding 4-1
 In walls 3-5
 iSC250 7-1
 Isolated Ground Receptacles 3-4
 Isolated ground receptacles 3-7

J

J-box 3-7

L

Lighting 3-8
 Literature Department 1-4
 local codes 3-5

M

M01700B103 6-2
 M01700B104B 5-2, 6-2
 M18906 7-2
 Measurements 4-4
 Measuring Current 4-5
 Modem 7-1
 Motor devices 3-5

N

NEC 3-3, 3-7
 NFPA 30A 1-4
 NFPA 70 1-4, 3-1, 3-3

O

Overhead 3-5

P

PA01570074 6-1
 PA01570080 5-1
 PA0258XXXXXXXX 6-2
 PA02710303 5-2, 7-2
 PA02710403 5-2, 7-1

PA02960009 7-1
 PA03060020 5-1, 6-1
 PA0324PB60 6-2
 PA0324PB6X 5-2
 PA0324PC60 6-1
 PA0324PC6X 5-1
 PA0324PS6X 5-2
 PA0324PX68 6-1
 PA03270203A 6-1
 PA03310003 6-2
 PA03380000 5-1
 PA03380001 5-1
 PA0338XXXX 6-1
 PA03400003 7-1
 PA03400017 5-2
 PA034000X4 7-1
 PA034000X5 7-1
 PA034000X7 7-1
 PA03440104 7-1
 PA040300XXX 6-1
 PA040300XXXXXXXX 5-1
 PA04060013 5-1
 PA040600X3 7-1
 PA0411000XXXX 5-1
 PA0412000XXX 7-1
 PA0412000XXXX 5-1
 PA04360000VXXXX 5-1, 6-2
 PA04640000XXXX 7-2
 PA04650000XXXX 7-2
 Passport 3-4, 5-1
 Peripherals 5-1
 Personnel
 Emergency (informing) 2-2
 Point of Sale 1-1
 POS 1-4, 3-1, 3-2, 3-9, 4-3
 Power and Grounding Verification 4-3
 PVC 3-10
 PX52 minitowers 6-1
 PX60 systems 3-10

Q

Q13181-05X 6-2
 Q13482-XX 3-10
 Q13708-01 6-2
 Q13708-08B 6-2
 Q13724-02 6-2
 Q13850-06 3-10

Quadplex 3-7

R

Raceways 3-6
Refrigeration units 3-5
Reliability 3-1
RS-232 3-8

S

Safety 3-1
Safety Information
 Emergency personnel 2-2
 Open flames 2-2
 Smoking 2-2
 Sparks 2-2
 Working alone 2-2
Scanner 5-2
Server 5-2
shielded wiring 3-6
Simplex 3-7
Single Point Grounding 4-1
Sub-panels 3-8
System Testing 4-3

T

Technical assistance 1-4
Technical Support 1-4
Test Equipment 4-3
Testing 4-4
Testing Electrode Impedance 4-2
Time 1-4
Training 1-4

U

Underground 3-5
UPS 5-2
Utility receptacles 3-5

V

Verifying Earth Grounding
 Electrodes 4-4

W

Wiring Guidelines 3-8
Wiring troughs 3-6