

Chapter 1

General Information

1.1 Introduction.

This manual is designed to step through the installation of a SmartFill GEN 3 system, in the order of events that take place during a normal installation. Please contact the manufacturer should you have suggestions, or error corrections.

There are icons used in this manual, which are designed to draw your attention to a particular area of importance. There are only 2 used, and their meanings are as follows.

WARNING



WARNING. This icon indicates that the relevant information is warning you of a potential hazard, or mishap event that may occur if you do not read and follow the advice given. It is extremely important that you read and fully understand information following a Warning Icon.



TIP. This icon indicates that the information is a Tip to assist you, a suggestion or a shortcut to a better method.

1.2 Overview

SmartFill GEN 3 is a state of the art fuel management system specifically designed to work in the most demanding of environments. It is housed in a rugged Automotive Grade Nylon Resin enclosure that is built to survive harsh environments and its modular design ensures ease of installation, upgrade and repair.

Users access fuel by using either keys or entering identification information via the keypad. Transactions always include the vehicle identification, the time and date, the quantity of fuel dispensed, the pump from which the fuel was taken and if enabled, the driver, the odometer/ hours of the vehicle or plant.

All data is stored in the unit and, if connected to the Internet, automatically sent to a secure website: www.fmtdata.com. The unit can be connected to the website using an Ethernet connection that has a connection to the Internet, a Wi-Fi connection or a 3G/4G connection.

The unit can be configured locally using the keypad and on-screen menus or via the website.

1.3 Terminology

Term	Meaning
Key	iButton or NFC card/Fob used to identify a driver or vehicle
Module	A plug in module that is used in the unit e.g pump module
AC	Alternating Current - normally 110VAC/Mains power
DC	Direct Current - either 12V or 24V DC

1.4 Safety Warnings

WARNING



- **HIGH VOLTAGE WARNING** - Some SmartFill GEN 3 systems involve / require hazardous electrical voltages to be present. Electrical installation, testing, maintenance or repairs **MUST** be carried out by a suitably licensed electrician.
- To help prevent electrical shock, connect the SmartFill GEN 3 into properly grounded sources.
- To help prevent possible damage to the SmartFill GEN 3 and or other interfacing equipment, wait 5 seconds after turning off all interfacing equipment before disconnecting interconnecting cables.
- To help protect your SmartFill GEN 3 from sudden, transient electrical increases, your SmartFill GEN 3 is equipped with surge protection. All equipment interfacing your SmartFill GEN 3 needs to use a surge suppressor, line conditioner, or un-interruptable power supply (UPS).
- Be sure nothing rests on your SmartFill GEN 3 cables and that the cables are not located where they can be stepped on or tripped over.
- Do not push objects into the openings of your SmartFill GEN 3. Doing so can cause fire or electrical shock by shorting-out internal components.
- In addition, take note of these safety guidelines when appropriate:
 - When you disconnect a cable, pull on its connector or its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. To disconnect this type of cable, press in the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to prevent bending connector pins. Also, before you connect a cable, make sure the two connectors are correctly oriented and aligned.
 - Hold components by their edges or by their metal mounting brackets.
- Safety concerns about the system should be immediately reported to your SmartFill GEN 3 supplier and the manufacturer.
- The system must be put out of order, suitably danger or out of service tagged, and must not be used if you have safety concerns.
- The SmartFill GEN 3 manufacturer's bear no responsibility / liability for work carried out by unqualified service personnel.
- All wiring **MUST** be in accordance with the relevant local / state / national regulations as required.
- Special precautions must be taken to ensure that the wiring and location of SmartFill GEN 3 systems is in accordance with the relevant regulations and authorities for that particular location.
- Special attention must be paid to locating equipment in possibly hazardous areas.
- The manufacturer can not provide advice or specification for correct wiring or hazardous area regulations, and in no way implies its suitability for use in a given area, this information **MUST** be sought by the installer, from the relevant authorities.
- SmartFill GEN 3 enclosures are not rated for use in hazardous areas, and as such the SmartFill GEN 3 must only be operated in a non-hazardous area.
- References: The following references, as a minimum, and as they apply to the installation, must be familiar to the technician performing the SmartFill GEN 3 installation:
 - NFPA Handbook 30, Flammable and Combustible Liquids Code, provides requirements for the safe storage and handling of flammable and combustible liquids.
 - NFPA Handbook 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, provides safeguards for dispensing liquid and gaseous motor fuels into the fuel tanks of automotive vehicles and marine craft.
 - NFPA Handbook 70, National Electrical Code (NEC), contains guidelines for the installation and operation of electrical equipment. Chapter 5 specifically addresses the installation of electrical equipment in hazardous locations.
 - NFPA Handbook 407, Standard for Aircraft Fuel Servicing, provides minimum fire safety requirements for procedures, equipment and installations during ground fuel servicing of aircraft using liquid petroleum fuels. Knowledge of this reference is necessary when performing an installation in support of aircraft fuel servicing.

1.4.1 Installing Company / Personnel Requirements.

- The quality of installation has a lasting effect on the performance of the equipment, and the value the SmartFill GEN 3 end user receives from the system. We cannot stress enough the importance of safe and high standard installation and commissioning practice's. Thorough initial basic training of the client is also crucial to the client getting best value from the equipment. Obviously, sufficient initial training also reduces the number of support calls that the installer receives.
- The installing company is responsible for ensuring that installation staff are competent, they are suitably qualified, and that work is performed in a safe manner, to a high standard.

1.4.2 Power Conditioners/Voltage Regulators

In locales where power sources fluctuate significantly and over voltages or brownouts occur, power conditioners or voltage regulators may be installed between the SmartFill GEN 3 and its power source for protection against high or low power inputs. These devices condition or regulate power to a constant or maximum output. Power conditioners maintain a constant power input when voltage may otherwise fluctuate between highs and lows which are not suitable for SmartFill GEN 3. Voltage regulators protect SmartFill GEN 3 from high voltage inputs similar to what may occur when an unregulated generator is initially turned on. Power conditioners are more complex and substantially more expensive to purchase.

1.4.3 Backup Generators

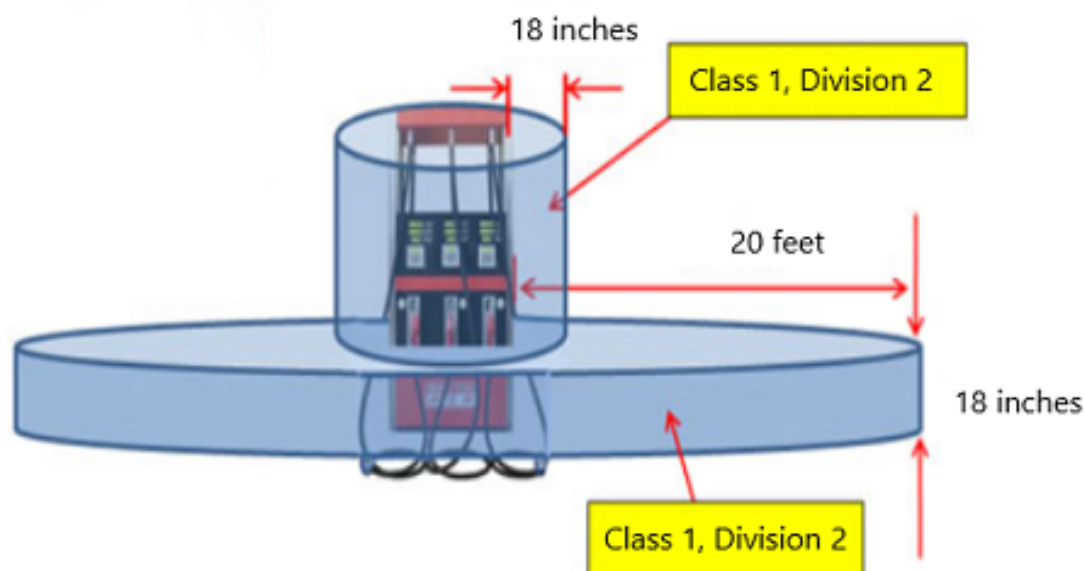
Some facilities are equipped with backup generators to supply AC power when the regular power supply goes down. During start-up of the backup generator the initial power surge may be extremely high until all connected equipment is restored to operation. This power surge has the same potential for damage to the SmartFill GEN 3 equipment as a lightning strike. Ensure the installed equipment is protected (regulated) from current surges during start-up of the backup power source. If possible, turn off the SmartFill GEN 3 power until non-regulated generator power stabilizes.

1.5 Ratings

	AC	DC
Operating Voltage	90 - 250 VAC	10 - 36 VDC
Operating Current	0.38A - 0.15A	2A - 0.6A
Pulser	15V @ 2.5mA	15V @ 2.5mA
Nozzle Switch	3.3V @ 0.2mA	3.3V @ 0.2mA
Fuse Rating	1A	2A
Maximum Switching	250VAC @ 10A	24VDC @ 5A
Delay Power Switch	N/A	36V @ 2A

1.6 Certifications/Approvals

Figure 1 illustrates the boundaries of a hazardous location which dispenses flammable liquids such as gasoline and E85.



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Figure 1.1: Boundaries for Hazardous Locations

The boundary area around a compressed natural gas (CNG) dispenser is different. It extends 5 feet from, and above, the dispenser. An electrical device installed within these boundaries must be intrinsically safe or must be enclosed within an explosion-proof enclosure. Intrinsically safe devices are generally limited to very low voltage and low current devices, such as that portion of a pulser before the barrier. Examples of explosion-proof enclosures are rigid metal conduit, and junction boxes and conduit fittings approved for use in hazardous locations. If the electrical device is not intrinsically safe, or is not explosion-proof, then it must be installed outside the hazardous area.

1.6.1 Regulatory Compliance and RF Exposure Information (U.S. Only)

1.6.1.1 FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1.6.1.2 RF Exposure Statement (FCC KDB 784748 Section A.8)

To satisfy FCC RF exposure requirements, this device and its 4G/LTE antenna must be installed and operated with a minimum separation distance of 20 cm (approximately 8 inches) between the antenna and all persons during normal operation.

Note: While the device includes an NFC reader designed for close-range interaction (e.g., under 1 cm), the 4G/LTE antenna is physically located more than 20 cm away from the user interaction area. This ensures compliance with RF exposure limits.

1.6.1.3 Detachable Antenna Notice

This device is designed to operate only with the manufacturer-provided detachable antenna. Use of any other antenna is strictly prohibited and may result in non-compliance with FCC regulations.

1.6.1.4 Approved Antenna Information

Antenna Type	Connector Type	Max Gain (dBi)	Impedance (Ω)
4G/LTE External Fiberglass Antenna	SMA Male	1.66	50

1.7 Warranty Information

1.7.1 Warranty

1. FMT shall provide to the Customer a warranty for all Goods against defects in materials and workmanship for a two year period (the Warranty Period) commencing on the sale date to the Customer (the Warranty Commencement Date) of the relevant Goods.
2. The Product Warranty only applies to the Customer who originally purchased the Goods. It is personal and may not be assigned or transferred without the prior written consent of FMT.
3. Subject to Clause 1.7.2, FMT (at its option) will replace or repair for the Customer, free of charge, part or parts, found upon examination by FMT, to be eligible for this Product Warranty. If any Goods or part is replaced or repaired under this Product Warranty, that Goods or part will carry the remainder of the Product Warranty from the Warranty Commencement Date.
4. The Product Warranty is in addition to any consumer guarantees existing available to the Customer at law and the Product Warranty does not exclude such consumer guarantees.
5. All enquiries regarding the Product Warranty may be directed to FMT on 1 800 569 8704.
6. All warranty requests will need to be submitted via email to support.us@fmtweb.com which will generate a unique RMA number, an RMA form will need to be completed with the details of the request.

1.7.2 Warranty Claim Procedure

1. In order to make a claim under the Product Warranty, the Customer must notify FMT in writing of any defect in the Goods discovered during the Warranty Period as soon as the Customer becomes aware of the alleged defect specifying in reasonable detail the nature of the defect. Such notice may be made by any one or more of the following methods:
 - By Post addressed to: Fluid Management Technology LLC, 25235 Dequindre Road, Madison Heights MI, 48071
 - By email to: support.us@fmtweb.com
2. A RMA number will need to be generated and an RMA form needs to be completed with the details of the request, contacting us by email at support.us@fmtweb.com automates this process.
3. Upon FMT verifying the validity and currency of the Product Warranty in respect of the Customer's claim, the Customer must upon request by FMT send the Goods to FMT or FMT's authorized representative .
4. The customer must ensure that the Goods are properly packaged so as to ensure that no damage occurs to the Goods during transit. The Customer is responsible for all posting, shipping, freight and insurance charges in respect of the Goods returned to FMT. Whilst in transit, the Goods remain at the Customer's risk.
5. FMT may, in its absolute discretion reimburse the Customer for the Customer's cost to undertake such repairs to the Goods, provided that the Customer has first provided to FMT a written quote as to the estimated costs of the Customer undertaking such repair, and FMT has approved (in writing) the Customer to proceed with such repairs up to that agreed estimated cost.
6. Upon receiving the Customer's written quote, the Customer acknowledges that FMT shall have sole discretion as to whether FMT engages its own contractors to undertake the required repairs, or if the Customer may undertake such repairs.
7. The customer agrees that FMT shall have no obligation or liability to reimburse the Customer for the costs of any repairs undertaken by the Customer that have not been agreed in writing with FMT beforehand.
8. FMT reserves the right at its sole discretion to determine whether to replace or repair, free of charge, any part or parts, or the entire Goods.
9. The customer is responsible for all packaging, posting, shipping, freight and insurance charges in respect of any Goods returned by FMT to the Customer. The Customer agrees to pay such charges upon the same payment terms as apply to FMT's sales of Goods current at the time of the Product Warranty claim. Whilst in transit, the Goods remain at the Customer's risk.

1.7.3 General Exclusions and Limitations of the Warranty

1. The Product Warranty is limited to replacement or repair of defective parts or defects in workmanship and does not include any labor costs (whether such labor costs are supplied by FMT or the Customer).
2. In the event that no identical parts are available to repair the defective Goods, FMT has the right to replace the Goods with similar Goods of equal age and condition as the defective Goods, or offer the Customer the choice to upgrade the defective Goods. These may incur additional costs to the Customer and the Customer in those circumstances agrees to pay those additional costs upon the same payment terms as apply to FMT's sales of Goods current at the time of the Product Warranty claim.
3. Replacement Goods or parts may include re-manufactured or refurbished parts or components. Repaired or replaced Goods will continue be warranted for the remainder of the Product Warranty from the Warranty Commencement Date.
4. The Product Warranty does not cover consumables, including but not limited to batteries and surge protectors.
5. The Warranty will not apply, and FMT will be under no obligation or liability whatsoever if, in the opinion of FMT, the Goods have been:
 - (i) installed and maintained other than in compliance with FMT's product specifications, instructions and directions;
 - (ii) installed or used other than in a manner approved by FMT as suitable for the Goods;
 - (iii) handled in a manner which contravenes any direction, instruction or warning issued by FMT from time to time;
 - (iv) misused, abused, changed or damaged in any way;
 - (v) tampered with, including if any factory applied serial number has been changed or removed from the Goods;
 - (vi) damaged through normal wear and tear including exposure to the elements (on exposed and unexposed surfaces), exposure to unusually corrosive conditions, rust, or entry by any insect, vermin or foreign object in the Goods;
 - (vii) damaged as a result of connection to irregular voltage sources, voltage supply problems, power surges and dips, thunderstorm activity, result of a natural disaster, or acts of God (including fire, flood, lightning).

1.8 Recommended Tools for Installers

The following tools are required for SmartFill GEN 3 service and installation:

- Digital Multimeter, preferably with a DC voltage resolution of 3 digits. **We use and recommend the Fluke Model 117 True RMS Multimeter.**
- **A good quality small electrical flat blade screwdriver.** Poor quality screwdrivers do damage to terminals and prevent sufficient tightening of electrical terminals etc.
- A general set of flat and Philips VDE screwdrivers.
- Metric and Imperial VDE Hex (Allen) keys. Long ball head types are recommended.
- A cordless drill, with backup batteries.
- Metal Holesaws, sizes 16mm, 20mm, and 32mm.
- Flat and round files (for deburring metal holes).
- Pointed, and Side cutting pliers.
- Multi-Grip type pliers.
- Metric tape measure.



- The following tools are highly recommended, they make working with SmartFill GEN 3 easier:
 - Deep 10mm and 13mm VDE sockets, 1/4" or 3/8" drive with long extensions.
 - 1/4" drive VDE screwdriver handle with 7mm and 7/32" deep sockets fitted. The ends of the sockets should be machined or careful ground down to reduce diameter at the end of the sockets.
 - 3/8" x 7/16" Open End VDE Spanner.
 - 13mm Open End / Ring VDE Spanner.

1.9 Pre-Installation Checks

Check the condition of the SmartFill GEN 3 and its associated parts when opening. Tell your SmartFill GEN 3 supplier immediately if items are damaged or missing. Its obviously best to carry out this check prior to traveling to the job.

- Check for the following items:
 - The SmartFill GEN 3 Control Box.
 - 20 vehicle NFC Fobs with keytags.
 - USB.
 - Mounting kit.
 - SmartFill GEN 3 installation manual.
 - SmartFill GEN 3 envelope with security code inside for website setup.

1.10 Safety Related Inspections and Preventative Maintenance

SmartFill GEN 3 units require no preventative maintenance to retain its user safety features. Whenever a SmartFill GEN 3 is updated or repaired, a safety inspection should be performed including wiring integrity (power and grounds), board retention and safety covers. We suggest regularly cleaning the unit to prevent build ups of dust or debris that can cause a hazard.

1.11 Cleaning Instructions

The SmartFill GEN 3 chassis, keypad & LCD glass should be washed with a mild detergent diluted with water. A soft sponge or cloth is recommended. Rinse and dry with a soft dry cloth. The SmartFill GEN 3 works well and presents no safety problems when dirty. Frequency of cleaning is left to the user's discretion.

1.12 Support

Fluid Management Technology may be contacted at support.us@fluidmt.com.