



No. 817439300

Revision D3

WGT Outdoor Unit - Manual

INSTALLATION

SAFETY CONSIDERATIONS

Read all warning notes and instructions carefully. They are included to help you installing the Product safely in the highly flammable environment of the fuel station. Disregarding these warning notes and instructions could result in serious injury or property damage. It is the installer responsibility to install, operate and maintain the equipment according to the instructions given in this manual, and to conform to all applicable codes, regulations and safety measures. Failure to do so could void all warranties associated with this equipment.

Remember that the fuel station environment is highly flammable and combustible. Therefore, make sure that actual installation is performed by experienced personnel, licensed to perform work in fuel station and at a flammable environment, according to the local regulations and relevant standards.

WARNING - EXPLOSION HAZARD

Install the Product only in the non-hazardous area of the fuel station.

Use standard test equipment only in the non-hazardous area of the fuel station, and approved test equipment for the hazardous areas.

In the installation and maintenance of the Product, comply with all applicable requirements of the National Fire Protection Association NFPA-30 “Flammable and Combustible Liquids Code”, NFPA-30A “Automotive and Marine Service Station Code”, NFPA-70 “National Electric Code”, federal, state and local codes and any other applicable safety codes and regulations.

Do not perform metal work in a hazardous area. Sparks generated by drilling, tapping and other metal work operations could ignite fuel vapors and flammable liquids, resulting in death, serious personal injury, property loss and damage to you and other persons.

CAUTION - SHOCK HAZARD

Dangerous AC voltages that could cause death or serious personal injury are used to power the Product.

Always disconnect power before starting any work. The Product has more than one power supply connection port. Disconnect all power before servicing.

WARNING – PASSING VEHICLES

When working in any open area of fuel station, beware of passing vehicles that could hit you. Block off the work area to protect yourself and other persons. Use safety cones or other signaling devices.

CAUTION

Do not attempt to make any repair on the printed circuit boards residing in the Product, as this will void all warranties related to this equipment.

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DISCLAIMER

This document is provided for reference only. Although every effort has been made to ensure correctness, ORPAK SYSTEMS does not guarantee that there are no errors or omissions in this document.

FCC COMPLIANCE STATEMENT IN USER'S MANUAL

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.

Sample user information for a Class A digital device:

THE FCC WANTS YOU TO KNOW:

This equipment has been tested and found to comply with the limits or 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.

his equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, ay 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.

FCC Warning

Modifications not expressly approved by the manufacturer responsible could void the user's authority to operate the equipment under FCC rules.

Sample user information for a Class B digital device

THE FCC WANTS YOU TO KNOW:

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 area.

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 not 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 the receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician

FCC Warning

Modifications not expressly approved by the manufacturer responsible could void the user's authority to operate the equipment under FCC rules.

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SECTION 1 GENERAL DESCRIPTION

1-1. WGT – WIRELESS GATEWAY TERMINAL

The Wireless Gateway Terminal (WGT) is an electronic unit, part of Orpak Wireless Vehicle Identification Solution (FuelOmat Gold) for vehicle identification based fueling solution for gas stations. As part of the solution, one or several WGT units are installed in gas stations to form a wireless network communication data from the vehicle units to the station controller through short range RF communication (very low power) in the ISM 2.4 GHz band. The number of WGT units mainly depends on station size and number of dispensers covered. In each station one of the WGTs is a Master WGT (M-WGT) and it will be connected to the forecourt controller (FCC) via LAN. The rest of the WGTs in the station do not require LAN connection.

The WGT can be installed in:

On a pole or wall mounted configuration which requires using the WGT Outdoor box (refer to User Manual P/N 817439300).

1-2. WGT OUTDOOR BOX

The WGT Outdoor box is made of plastic to allow for uninterrupted passage of the RF signal. The WGT Outdoor box includes the WGT as shown in Figure 1-1.

There are two types of WGT boxes:

- With internal power supply
- Without internal power supply



Figure 1-1. WGT - General View

1-3. INSTALLATION OPTIONS

The preferred installation method depends on the layout and configuration of the gas station.

There are three installation options for the WGT Outdoor Box:

1. Unit mounted on a wall or a pole in the island
2. On a dedicated pole or pedestal
3. Under the station canopy (less recommended due to maintenance convenience).

Any of the above selected methods must comply with UL and EU requirements.

1-4. INSTALLATION REQUIREMENTS

Due to safety requirements, it is allowed to install a WGT box within a non-hazardous location only as shown in the control drawing (see Figure 1-4). The hazardous location is defined within the NFPA 70830A.

1-5. INTERNAL POWER SUPPLY

An optional internal power supply can be used to operate the WGT using regular mains voltage. This option eliminates the need for an external power supply or DC power source.

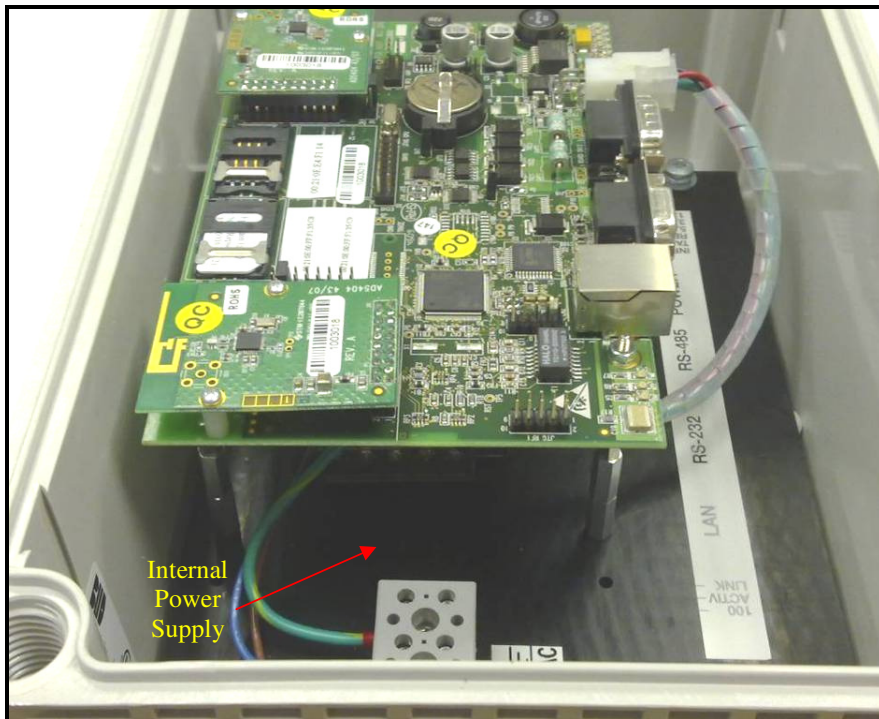


Figure 1-2. WGT – with Internal Power Supply

1-6. EXTERNAL POWER SUPPLY

If an external PS is used to operate the WGT, a unit with no PS is available. The power supply should provide 12V to 28V DC output and should be approved according to the local regulation. In North America use only AC to DC NEC Class 2 power supply, low voltage and low current maximum 100 VA even under fault conditions. The power supply can be installed in the office, in a separate box object to requirements in NFPA 70 830A and approval of authority having jurisdiction (AHJ) DC cable will be connected to the DC input in the WGT box.



Figure 1-3. WGT – with External Power Supply

Note: If the power supply is not installed next to the WGT box, make sure that the WGT receives a correct voltage (at least 12V) due to power fail on the lines. It is recommended that the distance between the power supply and the WGT box will not exceed 15m (50 feet).

1-7. INSTALLATION LOCATION

The WGT box must be installed at non hazardous area / non classified area, which means:

1. Above 18” (0.5 meter) from the island floor
2. At least 18” (0.5 meter) away from the dispenser

Figure 1-4 presents various possible WGT Box installation locations.

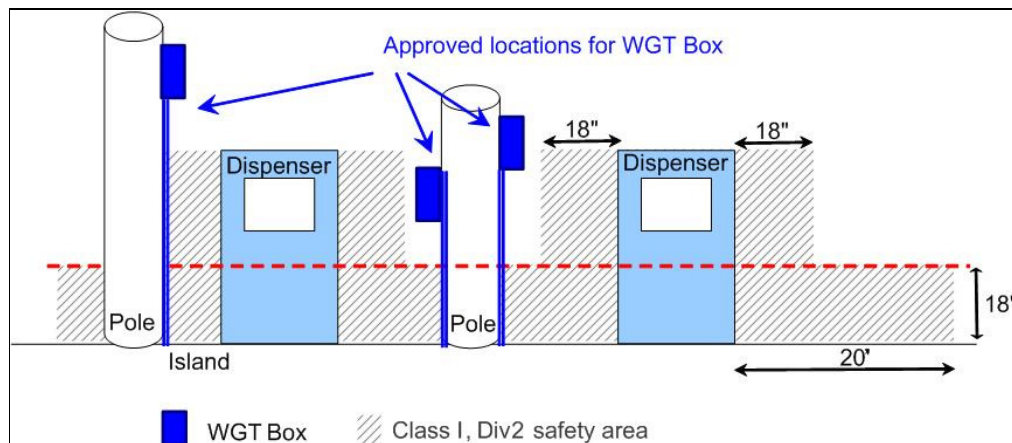


Figure 1-4. WGT, Outdoor Installation Control Drawing

1-8. INSTALLATION INSTRUCTIONS

The following paragraph provides step by step instructions for installation of the Outdoor WGT.

- a. Install the WGT in a non hazardous area according to Figure 1-4.
- b. Install the Master WGT and other WGTs in each station according to station topology.
 - The Master WGT, as opposed to the other WGTs, is connected to the FCC controller using shielded S-CAT5E LAN cable. Install the master WGT as close as possible to the FCC controller.
 - Install the WGT in a line of sight with the Master WGT or other WGT/s, within a distance not exceeding 15 meters (approximately 50 feet).
 - For ease of maintenance, it is recommended not to install the WGT higher than two meters from the ground. However, the higher the unit will be, the better will be the RF cover.
 - The installation procedures must meet all safety regulations according to local state regulations.
 - For UL listed WGT, All wiring to device must be in UL Listed rigid metal conduit or other methods permitted in NFPA 70 or NFPA 30A determined acceptable by the authority having jurisdiction
 - For non-UL WGT, glands are provided for the power and data holes

1-8.1. INSTALLATION (WITH INTERNAL POWER SUPPLY)

- Remove the WGT cover and install the unit on a smooth surface using four screws via holes located at the four corners of the unit.
- Refer to Figure 1-13 for the location of the four holes.
- Install the WGT vertically where the two cable holes are located at the bottom section of the unit (see Figure 1-5). Failure to install in required orientation may result in water leakage into enclosure
- The WGT has an internal power supply that requires 220VAC/115VAC input.
- The input to the internal power supply passes through a terminal block that has three input connections as specified below:

Yellow – GND

Blue – Neutral

Brown – 220/115VAC

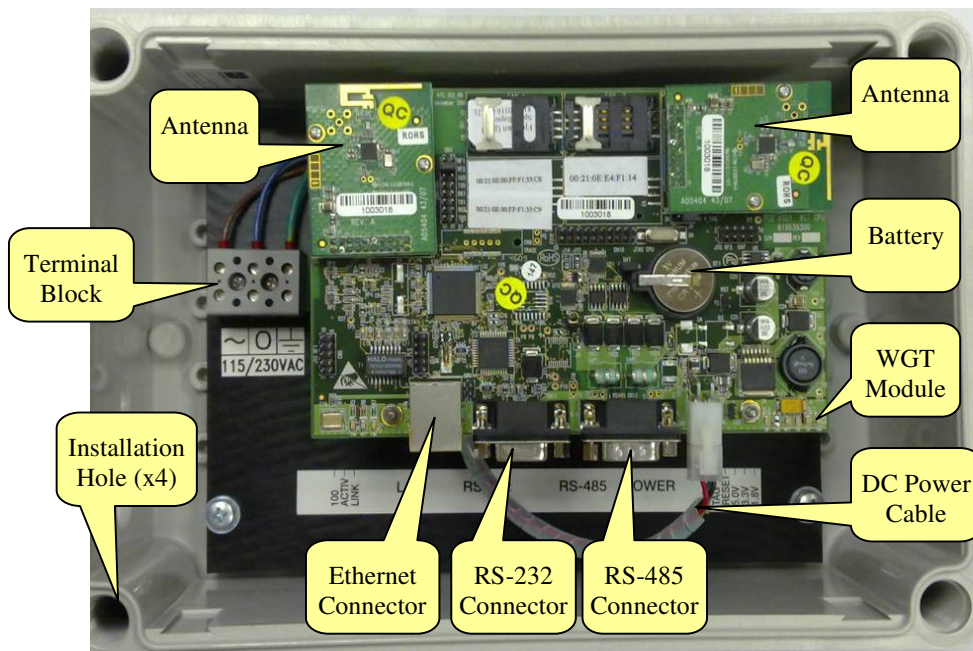


Figure 1-5. WGT Outdoor Box, Inside View

- Connect the AC cables through the power terminal.

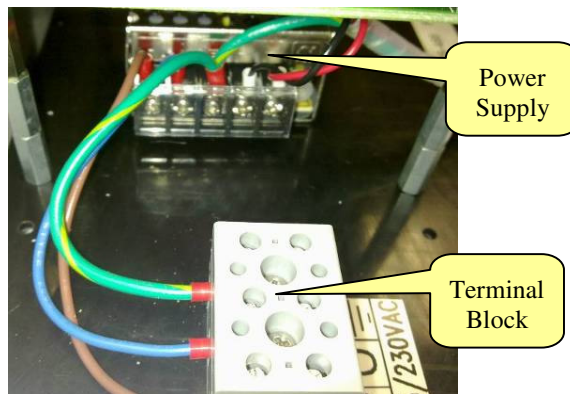


Figure 1-6. Terminal Block – Internal View

- For the Master WGT, connect a shielded S-CAT5E cable using RJ-45 connector.
- For UL listed units, all wiring to device must be in UL Listed rigid metal conduit or other methods permitted in NFPA 70 or NFPA 30A determined acceptable by the authority having jurisdiction.

The large hole can host conduits up to 23mm (0.9”) in diameter between and the small hole can host conduits up to 12mm (0.47”). Upon final installation, both holes of enclosure bottom must be connected to conduit.

For non-UL units, use the provided couplers (glands). The large hole can host a coupler for cables in diameter between 0.23” to 0.53” (5.8 to 13.9mm) while the smaller coupler for cables in diameter between 0.114” to 0.25” (2.9 to 6.4mm).

-

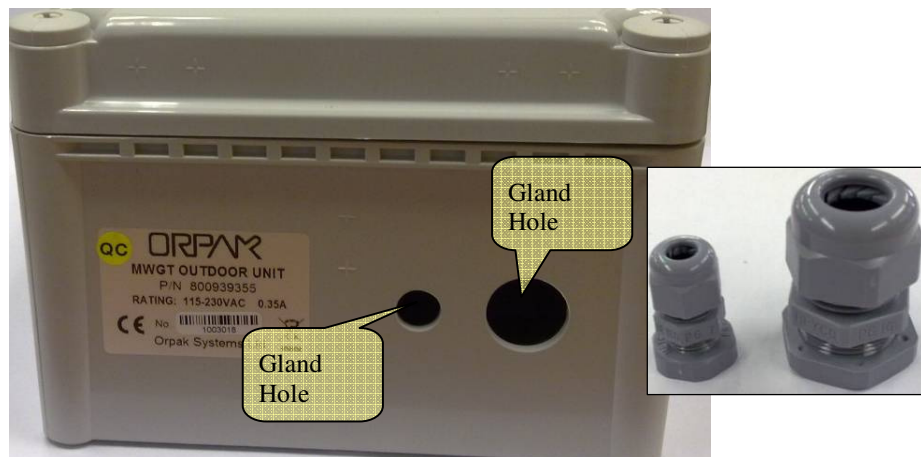


Figure 1-7. Gland Holes - General View

- Tighten the glands in order to prevent leak of water or gasses through conduits, cables and conductors.
 - In cases where you are not using one of the two enclosure cables entry be sure to seal it properly.
 - When installing cables into the WGT box, do not damage unit sealing (IP67 protection).
 - Assemble the unit cover using the four coarse pitch screws and than install the four screw clip-on knobs.
- Perform WGT initial setup prior to installation according to instructions provided in the FuelOmat Gold station installation and setup guide.

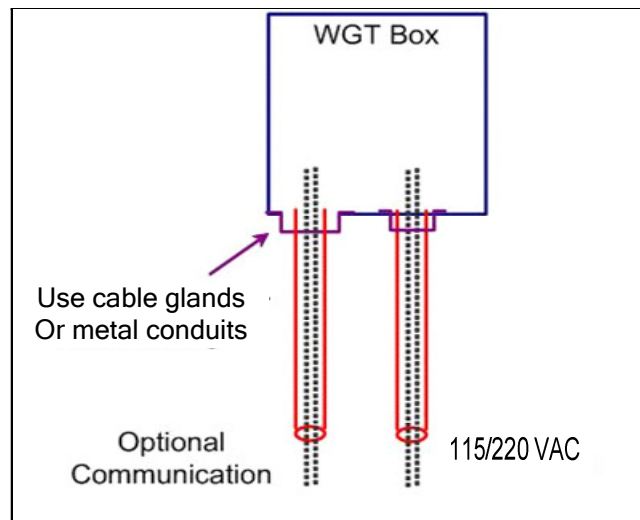


Figure 1-8. WGT Box Cable Installation

1-8.2. INSTALLATION (EXTERNAL POWER SUPPLY)

- Remove the WGT cover (see Figure 1-9) and install the unit on a smooth surface using four 0.2" screws via holes located at the four corners of the unit.
- Refer to Figure 1-13 for the location of the four holes.
- Install the WGT vertically where the two cable holes are located at the bottom section of the unit (see Figure 1-5).

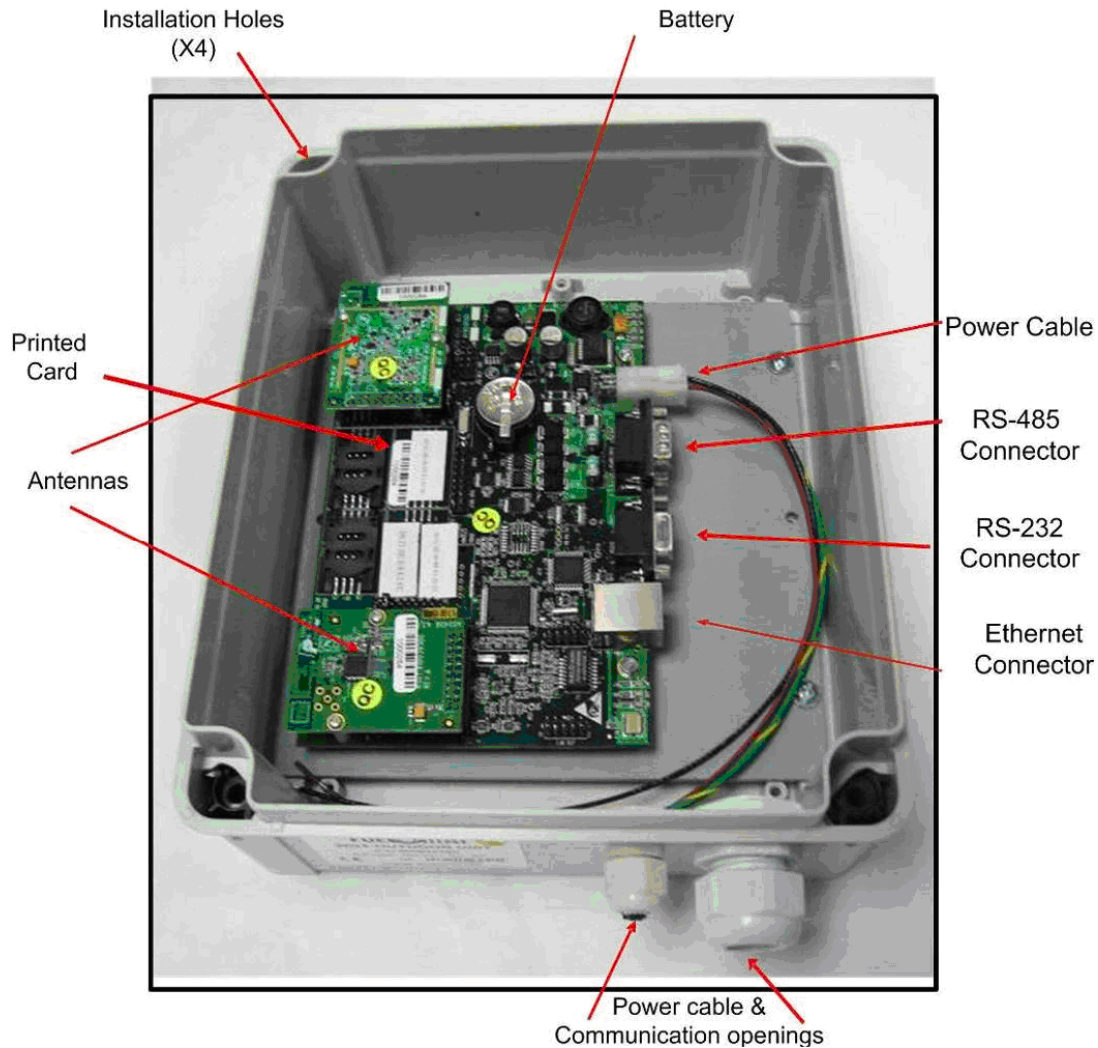


Figure 1-9. WGT - Cover Removed

- Connect leads from an external power supply for the Master WGT and WGTs to the flying leads inside the enclosure as specified in Table 1-1):
- For the master WGT, connect a shielded S-CAT5E cable using RJ-45 connector, as shown in Figure 1-10.

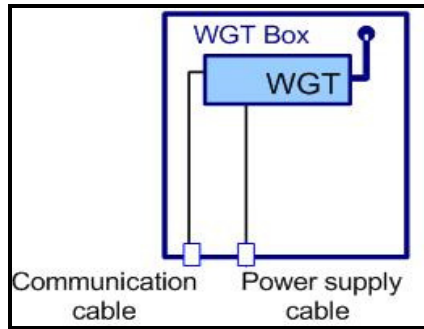


Figure 1-10. WGT External Connections

- For UL listed units, all wiring to device must be in UL Listed rigid metal conduit, or other methods permitted in NFPA 70 or NFPA 30A determined acceptable by the authority having jurisdiction.
The large hole can host conduits up to 23mm (0.9”) in diameter between and the small hole can host conduits up to 12mm (0.47”).
- For non-UL units, use the provided couplers (glands). The large hole (see Figure 1-11) can host a coupler for cables in diameter between 0.23” to 0.53” (5.8 to 13.9mm) while the smaller coupler for cables in diameter between 0.114” to 0.25” (2.9 to 6.4mm).

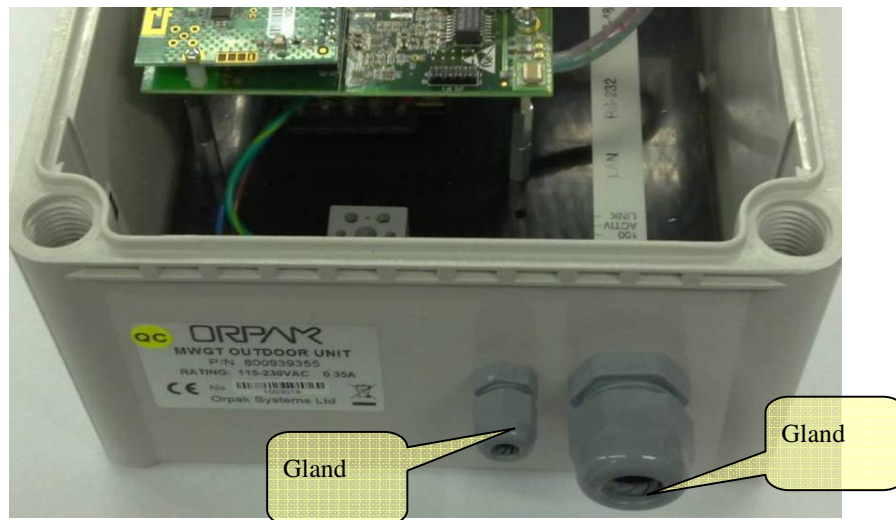


Figure 1-11. WGT Glands

- Tighten the glands to prevent leak of water / gasses through conduits, cables and conductors.
- In cases where you are not using one of the two wiring holes be sure to seal it properly.
- When installing cables into the WGT box, do not damage unit sealing (IP67 protection).
- Assemble the unit cover using the four coarse pitch screws and than install the four screw clip-on knobs.

- Perform WGT setup prior to installation according to instructions provided in the FuelOmat Gold Station installation and setup guide.

1-8.3. WIRING and LEDS DESCRIPTION

The WGT Box has power input and optional data (LAN or other) input/output. The LAN cable will be connected to the station network LAN only in cases where the WGT is a Master WGT.

In cases where a station does not have LAN connection, the RS485 can be used to interface the station controller instead of the LAN. The other I/O plugs (RS-232 and RS-485) will be connected only by certified technician for maintenance use only.

The cables must be placed in dedicated tubes which comply with UL/EU regulations and any other local regulations. The cables enter the WGT box from the sealing adapters which used to ensure the box sealing as shown in Figure 1-8.

Table 1-1. WGT Board Input Power Pin Assignment

<i>Pin No.</i>	<i>Assignment</i>	<i>Wire color</i>	<i>Remarks</i>
4	DC INPUT +V	Red	
2	DC INPUT -V	Black	
1	Ground	Yellow/Green	Ground connection to be connected to nearest ground.
3	PF		Not used

Table 1-2. RS485 Communication CN12 Pin Assignment

<i>Pin No.</i>	<i>Assignment</i>
	Channel 1
1	+485
2	-485
6	G485
	Channel 2
3	+485
4	-485
8	G485
7, 9, case	Ground
5	N.C.

Table 1-3. CN2 Pin Number Assignment, LAN Communication

<i>Pin No.</i>	<i>Assignment</i>	<i>Wire color</i>	<i>Remarks</i>
Standard cable S-CAT5E			For master WGT application only

Table 1-4. CN11 Pin Assignment - RS232 Communication

<i>Pin No.</i>	<i>Assignment</i>	<i>Remarks</i>
2	TXD_232	
3	RXD_232	
4	MONITOR	
5	Ground_232	
7	CAN_H	
8	CAN_L	(MONITOR in old HW version)
9	CAN Ground	
1, 6	N.C.	

Table 1-5. Jumpers (Factory default)

Only authorized technicians are allowed to modify the jumpers!

<i>Jumper No.</i>	<i>Name</i>	<i>Description</i>
J2		Watch Dog
J3		Reset
J4/ Pins1-2	3.3V	SAM power is 3.3V
J4/ Pins2-3	5V	SAM power is 5V
J6		Switches the battery (BT1) to circuit

Table 1-6. Indication LEDs on the Left side of PCB (left to right)

<i>LED No.</i>	<i>Name</i>	<i>Description</i>
DL2	100	Indicates communication rate: Light on: 100 BPS Light off: 10 BPS
DL3	ACT	Blinks during active communication
DL4	LNK	Illuminates constantly when Ethernet communication is connected

Table 1-7. Indication LEDs on the Right side of PCB (left to right)

<i>LED No.</i>	<i>Name</i>	<i>Description</i>
DL9	GP	Illuminates constantly. Blinks during data transfer via external communication (Ethernet, RS-232 or RS-485)
DL(not shown)	TAG	Not used
DL(not shown)	RST	Reset LED. Illuminates during reset.
DL(not shown)	5V	Indicates +5V active
DL7	3V	Indicates +3.3V active
DL8	1V8	Indicates +1.8V active

1-8.4. BATTERY REPLACEMENT

The WGT has a Lithium battery (BT1) for RTC (Real Time Clock) backup. (Orpak P/N 812502030).

To remove battery for disposal:

- The WGT battery is designed for easy removal and replacement by customers.
- Read and use any precautions published by battery manufacturer in datasheet/website concerning battery storage, use and disposal.
- Make sure the WGT is disconnected from power before removing battery.
- Remove WGT cover by loosening the screws.
- Remove the battery from the socket (see Figure 1-12) and replace it with a new one. Replacing the battery should be done with the same type of battery p/n & manufacturer due to operating temperature and abnormal charging current.
- Replace only with battery Part No. CR2032 made by RENATA.

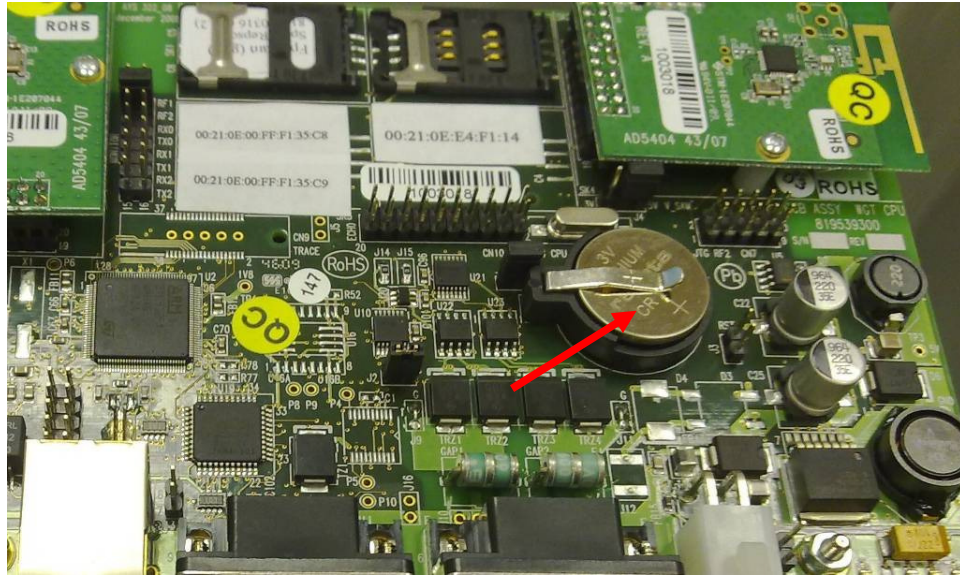


Figure 1-12. PCB Battery

- Discharged Lithium and Lithium Ion batteries are currently designated to be disposed off in normal trash.
- Battery Disposal must be done in accordance to the manufacturer instructions of the battery!.
- After battery replacement, return the WGT cover, close it and tighten the screws.

1-9. WGT OUTDOOR BOX SPECIFICATIONS (WITH POWER SUPPLY)

	PARAMETER	VALUE
Physical	Height –	241 mm
	Width –	194 mm
	Depth –	87 mm
	Weight – (with / without P/S)	1.6Kg
Power Supply data	DC output voltage	12V to 28V DC
	Rated current	0.35A
	Current range	0~0.625A
	Rated power	15W
	Voltage tolerance	1.0%
	Line regulation	0.5%
	Load regulation	0.5%
Power Supply input	Input voltage range	85~264VAC
	Frequency range	47~63Hz
	AC current (typ.)	0.35A/115VAC 0.25A/230VAC
Environment	Working Temperature	-40°C to +55 ⁰ C
	Humidity	20~90% non-condensing
Communication	TCP/IP over Ethernet	
	EIA 802.15.4	
	2.4GHz ISM band RF Network Communication with AES128 encryption	

1-10. WGT OUTDOOR BOX SPECIFICATIONS (NO POWER SUPPLY)

	PARAMETER	VALUE
Physical	Height –	241 mm
	Width –	194 mm
	Depth –	87 mm
	Weight –	0.8 Kg
Power	Operating voltage	12 - 28 V DC
	Operating current	0.5 A
Environment	Working temperature	-40°C to +55°C)
	Storage temperature	-40°C to +55°C)
	Humidity	95% RH
Communication	TCP/IP over Ethernet	
	EIA 802.15.4	
	2.4GHz ISM band RF Network Communication with AES128 encryption	

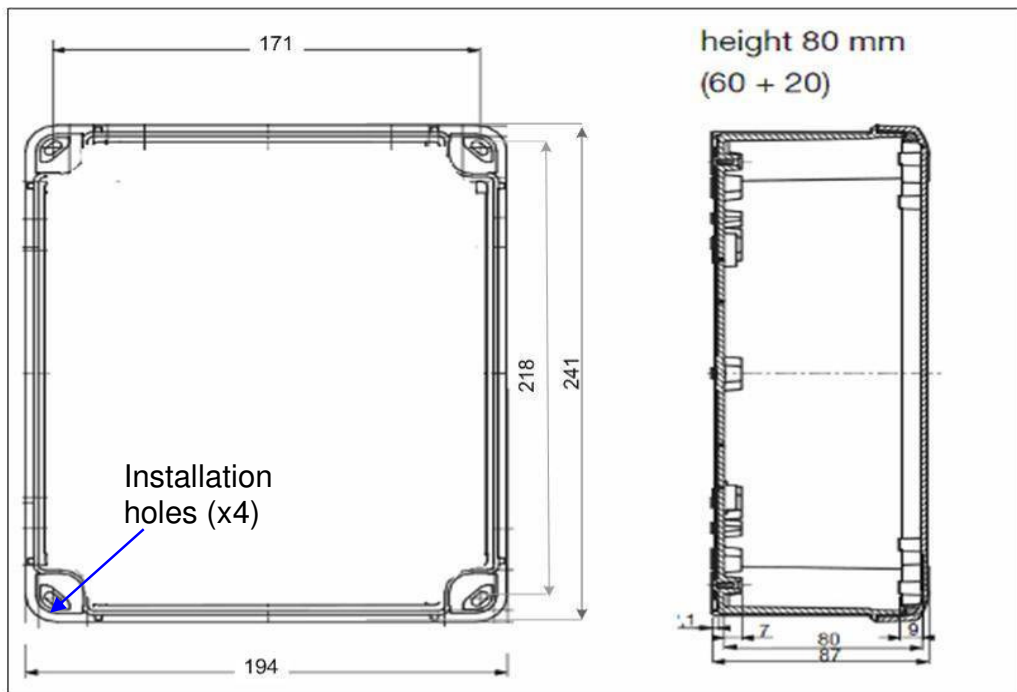


Figure 1-13. WGT Outdoor Box Dimensions

1-11. TROUBLESHOOTING

Table 1-1 lists the recommended procedures for troubleshooting the WGT.

Note that this Troubleshooting guide refers to installation issues only! For the full Troubleshooting guide refer to Orpak's "Station Installation and Setup Manual for New Deployments" User Guide, Cat. No. 817439320.

Table 1-1. WGT, Troubleshooting Procedures

No.	Symptom	Troubleshooting Procedure	Recommended Action
1	LEDs inactive	Check DC Voltage power supply output	Replace DC Voltage power supply
		Check AC and DC output	Replace power supply
		Check the proper connection between the Power Supply and the WGT	Wire the units anew
		Check fuse	Replace fuse (equal to or less than 3.2A)
2	No communication between the Master WGT and the FCC	Check CAT-5E cable connection between the Master WGT and the FCC	Replace one unit, then other units if necessary
		Check 'ping' between FCC and WGT	Set the WGT IP address
		Check WGT communication settings	Perform settings anew
3	No RF communication	Check Wireless Nozzle Reader setup	Replace Wireless Nozzle Reader
		Check WGT setup	Set WGT anew
4	No data received from vehicles	Verify that vehicle units are active (via the Wireless Programmer)	Replace vehicle unit if necessary
		Check SAM cards are well sited	Replace SAM cards if necessary
		Check WGT settings	