Matrix™ TOTAL FLUID MANAGEMENT SYSTEM

GRACO

Transceiver for Matrix Systems

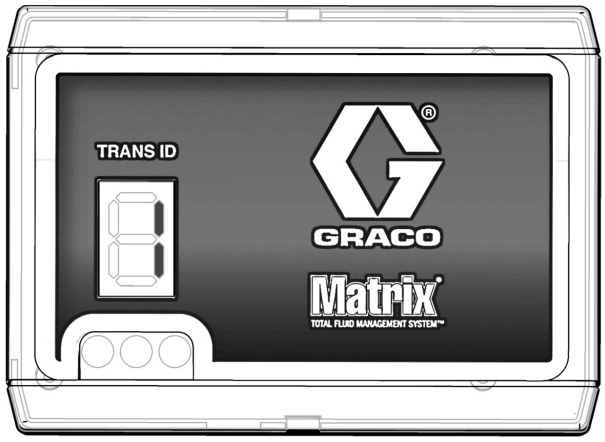
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EN

- For use with Matrix Total Fluid Management System Components -

Part: 257464

Important Safety Instructions
Read all warnings and instructions in this manual. Save these instructions.

Not for use in hazardous locations or in explosive atmospheres!



ti12127a

The Matrix Transceiver contains an RF device with the following approvals:

FCC ID: TFB-FREESTAR
IC: 5969A-FREESTAR

Industry Canada Statement
The term “IC” before the certification/registration number only signifies that the Industry Canada technical specifications

N14939 - FREESTAR
ZFMSM-101-1 (CEL) / FS24-100ST (LSR)

PROVEN QUALITY. LEADING TECHNOLOGY.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

⚠ WARNING



FIRE AND EXPLOSION HAZARD

When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources, such as cigarettes and portable electric lamps.
- Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Ground all equipment in the work area.
- Use only grounded hoses.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



ELECTRIC SHOCK HAZARD

Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power cord before servicing equipment.
- Use only grounded electrical outlets.
- Use only 3-wire extension cords.
- Ensure ground prongs are intact on sprayer and extension cords.
- Do not expose to rain. Store indoors.

Transceiver Overview and Component ID

Transceivers use a radio frequency (RF) signal to facilitate communication between the Matrix PC and other hardware components in the Matrix System. The number of transceivers a Matrix System can support is determined by the type of system (Basic/Pro/Premier) you have. Basic systems can only have 1 transceiver; Pro systems can have 1 or 2 transceivers; and a Premier system can have up to 8 transceivers. Each transceiver can support up to 150 RF devices.

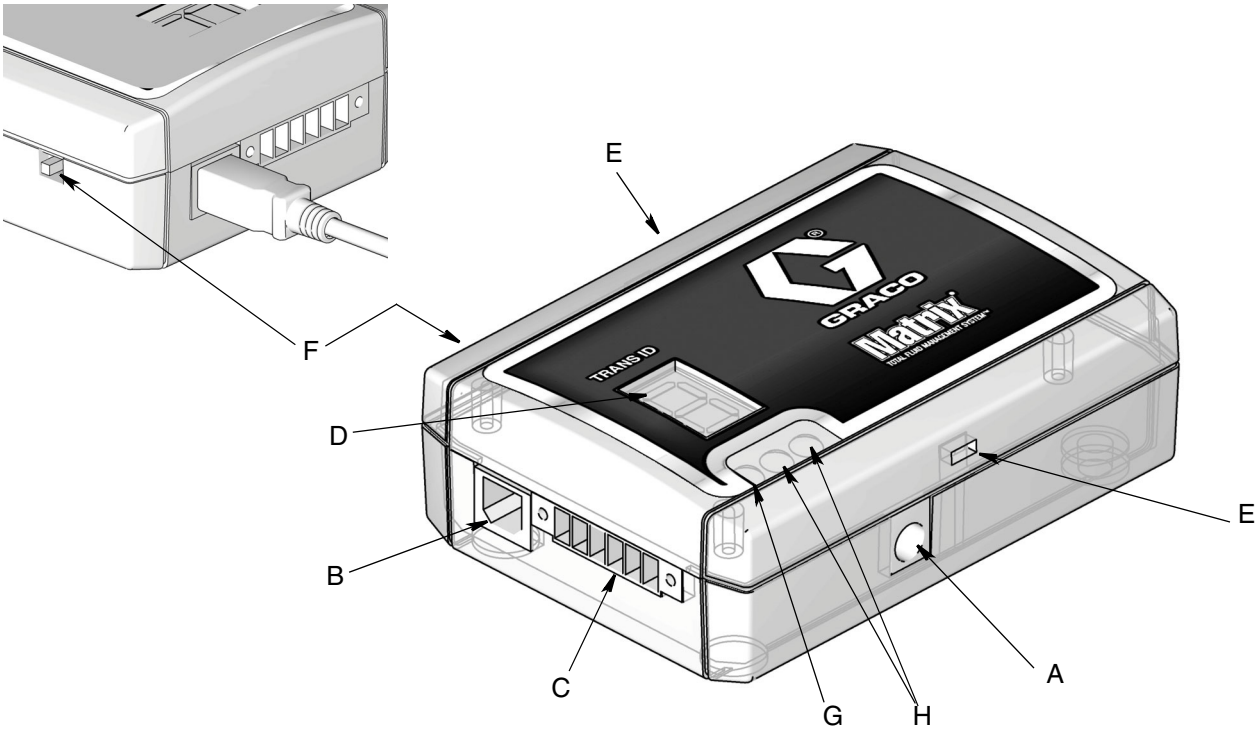


FIG. 1

Item	Name	Description
A	**Power Inlet Port**	Plug end of electric power transformer into power inlet A. Other end of cord is plugged into 120-240 VAC electrical outlet.
B	**USB Port**	USB cable connection port
C	**RS422 Port**	RS422 Converter connection port
D	**Display**	Shows Transceiver ID number assigned to the Transceiver at the Matrix PC
E	**Cover Clip**	Insert a flat screwdriver in the opening on each side of the cover to depress clips and remove cover
F	**Selection Switch**	Selects the connection port: USB or RS422. When using the USB connection switch should be moved to the right. For RS422 move switch to the left.
G	**Power Light**	Steady, green light. When lit, indicates the unit is receiving power.
H	**PC IN/OUT Lights**	Flashing red lights. When flashing, indicate there is transmission between the PC to the Transceiver and Transceiver to the PC.

Typical Transceiver Installations

Locate the transceiver in the main part of the shop, high on a wall or on the ceiling, in a location that provides an unobstructed line of site, near the meters and/or tank level monitors. If the transceiver is mounted outdoors, it must be placed into a protective, water proof, non-metallic, outside housing. Be sure to comply with all applicable local, state and national fire, electrical and safety regulations.

One -Transceiver Facility Layout

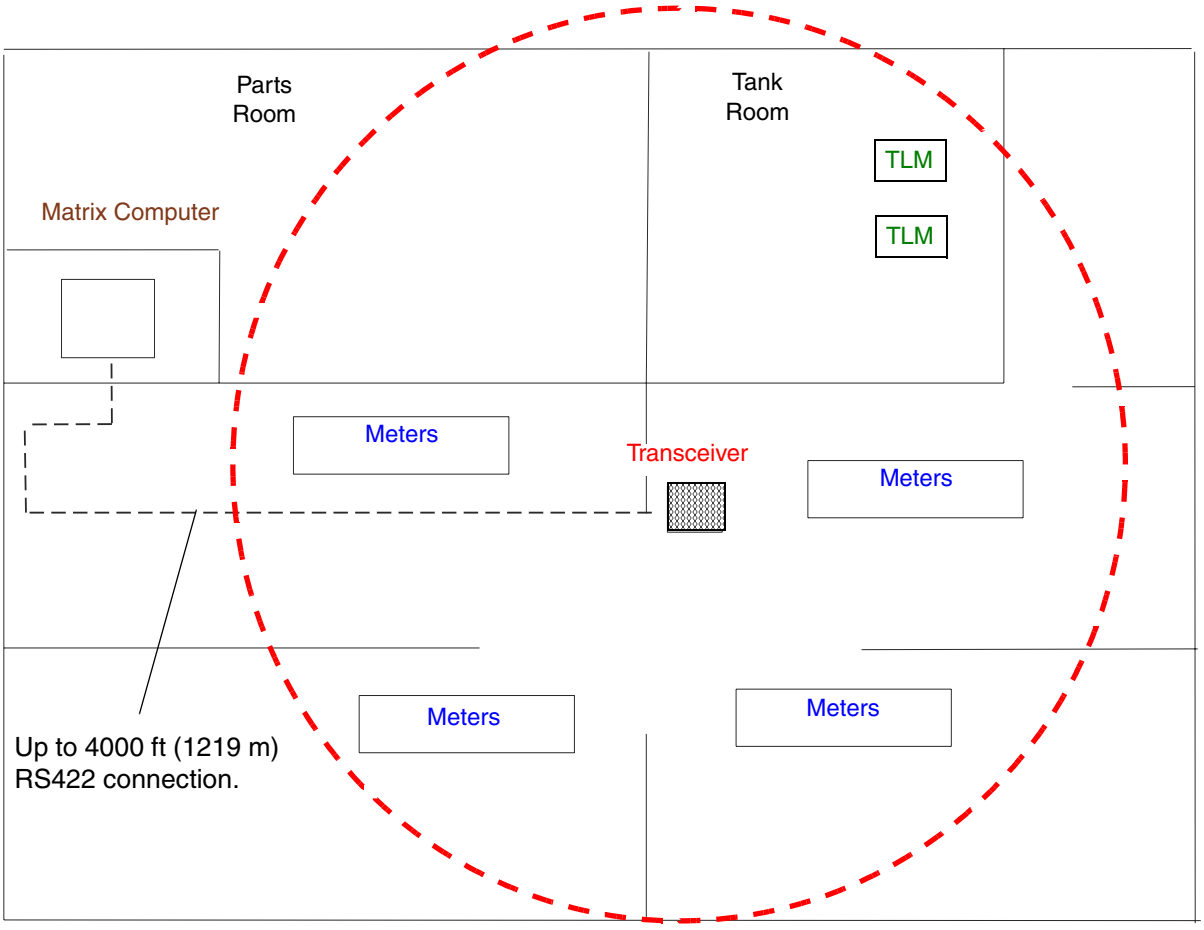


FIG. 2

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Two -Transceiver Facility Layout

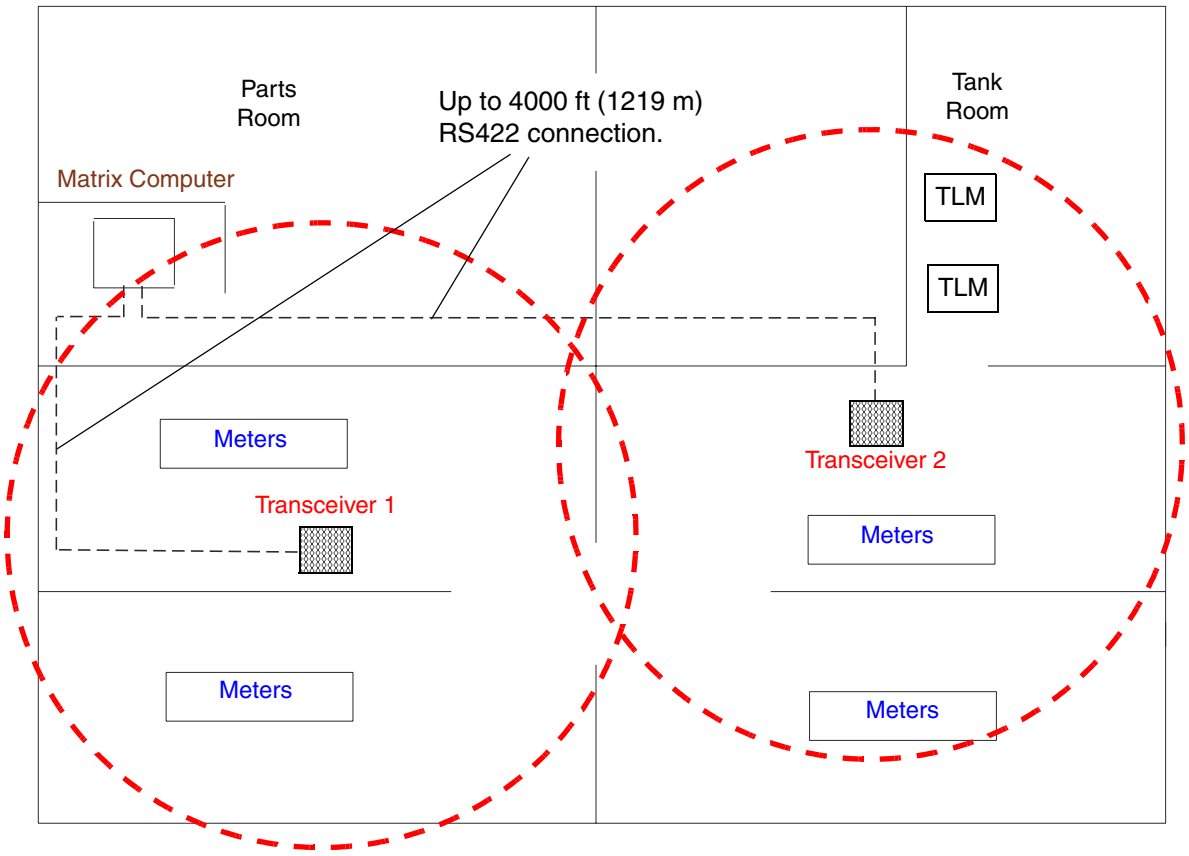
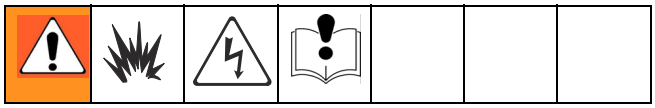


FIG. 3

Connecting Transceiver to Matrix PC



NOTICE

Cable connections and wiring should always be done prior to powering the transceiver.

The transceiver is powered by an electric power transformer that is plugged into the power connector port (FIG. 4, (A) and a grounded electrical outlet.

There are two options available for connecting the Transceiver(s) to the Matrix PC.

- Plug and play interconnection using a **USB Cable** (Universal Serial Bus) is recommended for wiring distances up to 16.4 feet (5 meters) between the Transceiver and Matrix PC. See FIG. 5, (B).
- For longer distances up to 4000 feet (1219 meters) between the Transceiver and Matrix PC an **RS422** adapter is required. See FIG. 10, page 7.
- A transceiver can be plugged into any Matrix PC as long as that PC is on a network with other Matrix PC's.
- The transceiver is always on when the Matrix system is used.
- Also see the Matrix 3.0 Software Instruction manual for information on Transceiver operation.

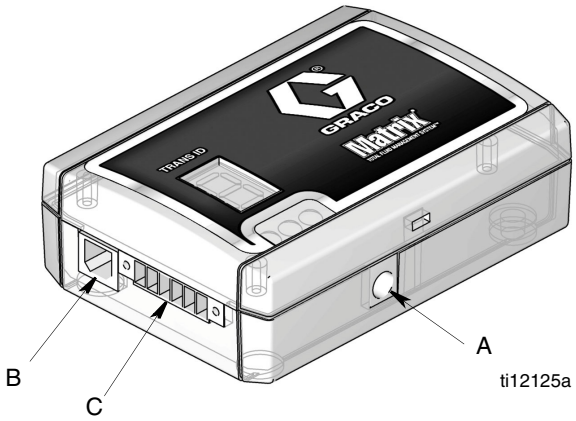


FIG. 4

Plug and Play USB Cable- (FIG. 5)

For distances between Transceiver and Matrix PC of 16.4 ft. (5 m) or less.

1. Connect USB connector (1) to computer USB port (2). Connect USB connector (3) to the Transceiver USB port (B). Coil and place the excess cable in an out of way location.

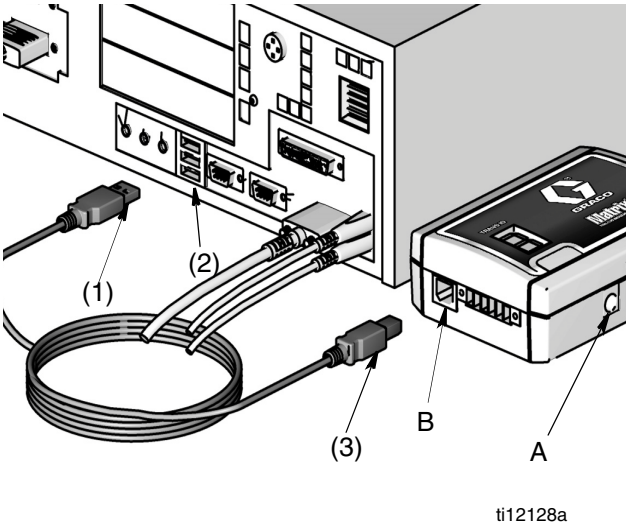


FIG. 5

2. Plug round end of electric power transformer into Transceiver power inlet (A) (FIG. 5) first and then plug transformer plug into a grounded 120 - 240 VAC power source.
3. Be sure the Selection Switch (F) is set to the correct position for the USB connection. Refer to FIG. 6 for the switch settings.

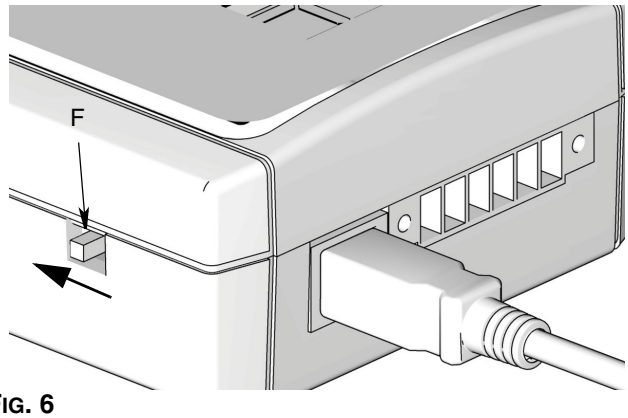


FIG. 6

4. The green power light (G) will illuminate indicating the Transceiver is on. See FIG. 7.

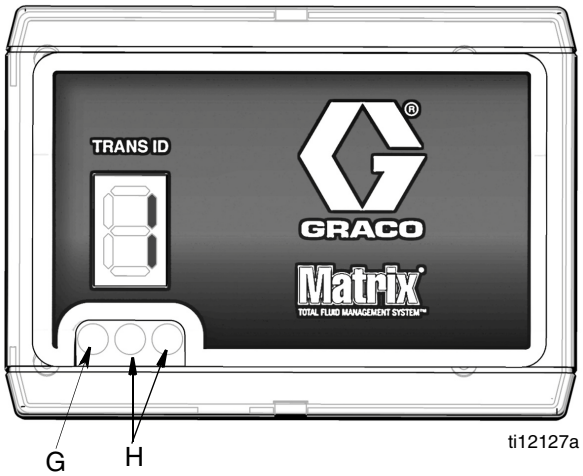


FIG. 7

RS422 Converter (c) (FIG. 8) - for wiring distances up to 4000 ft (1219 m).

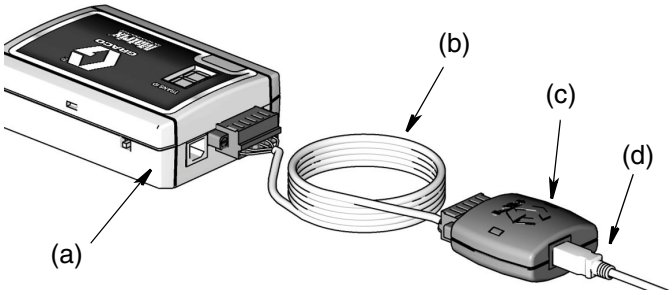


FIG. 8

Wiring Diagram

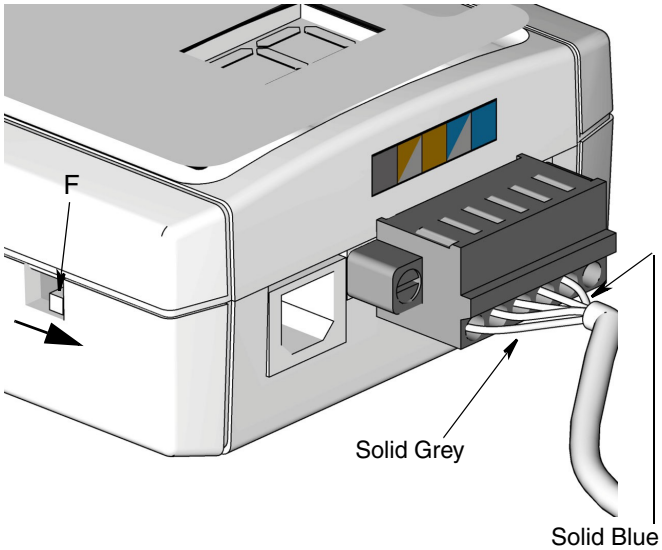


FIG. 9

RS422 Cable Wire Orientation

NOTE: *The Solid Grey and Solid Blue wires identified in FIG. 9 are identified as a reference to ensure correct orientation of components when connecting Transceiver to RS422 Cable*

1. Connect components: Transceiver (a), RS422 Cable (b), RS422 Converter (c) and USB Cable (d) as shown in FIG. 8.

   Note location and color of wires in Wiring Diagram (FIG. 9) to correctly connect RS422 cable to transceiver.

   Excess cable can be coiled and placed in an out of way location.

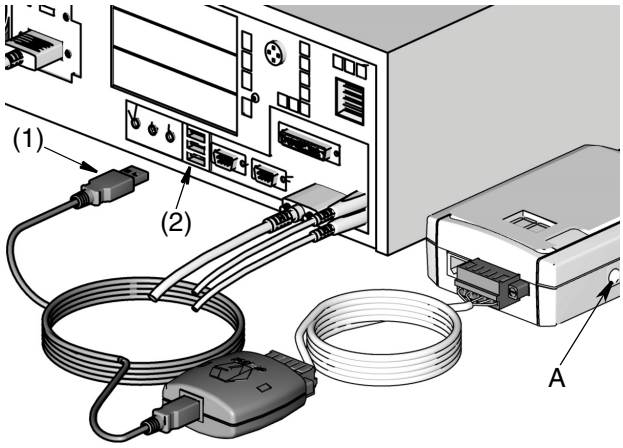


FIG. 10

2. Connect USB connector (1) to computer USB port (2). Plug end of power cord into Transceiver power inlet (A) first and then into a grounded 120 - 240 VAC power source.

3. Be sure the Selection Switch (F) is set to the correct position for the RS422 connection. Refer to FIG. 9 for the switch settings.

4. The green power light (G) will illuminate indicating the Transceiver is on. See FIG. 7.

NOTE:

- As soon as the RS422 converter is connected to the PC, the PC recognizes it as a new transceiver. However, it will not be able to relay messages to the hardware components such as the Tank Level Monitor (TLM) or Meter, until it is also connected to the Transceiver which contains the RF components.

- If your PC does not have enough USB ports for the Matrix Transceiver(s) connections, a USB hub must be used. These hubs are not supplied by Graco.

Installing Transceiver

During system installation, double-faced tape or screws can be used to allow relocation of the Transceivers to optimize RF communication.

Once RF communications are confirmed, the Transceiver can be permanently mounted on wall or ceiling.

- If the Transceiver is mounted outdoors, it must be placed in a protective water proof, non-metallic outside housing meeting IP65 Standards for outdoor use.
- Be sure to comply with all applicable local, state, and national fire, electrical, and safety regulations.

1. Remove the top cover from the Transceiver box by using a flat screw driver to depress the clip (E) on each side of the cover as shown in FIG. 11.

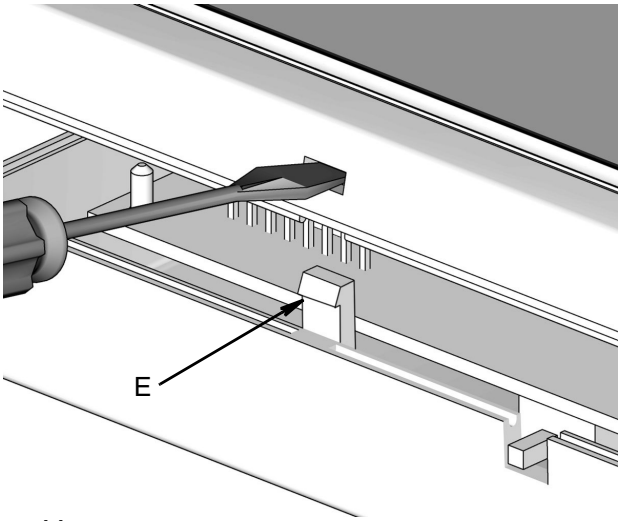


FIG. 11

2. Use the back plate as a template for hole placement. Mark holes on mounting surface.
3. Pre-drill holes.
4. Attach back plate to the wall or ceiling using screws.

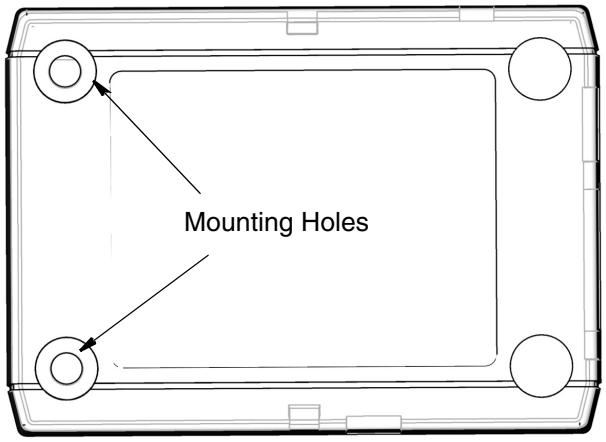


FIG. 12

5. Reattach transceiver box cover.

Transceiver Registration with Matrix PC Software

Transceiver registration is completed at the Matrix PC. The software is used to:

- Set the system's Network ID.
- Set the individual transceiver's Transceiver ID.
- Assign a Primary Client to each Transceiver.

Complete instructions for registering a transceiver with the Matrix PC software are provided in the Matrix PC Software instruction manual.

Operation

Once the Matrix system is installed, you can verify that the Transceiver is functioning correctly by observing each component's indicator light. Lights (H) will flash whenever there is communication between the Transceiver and Matrix PC software.

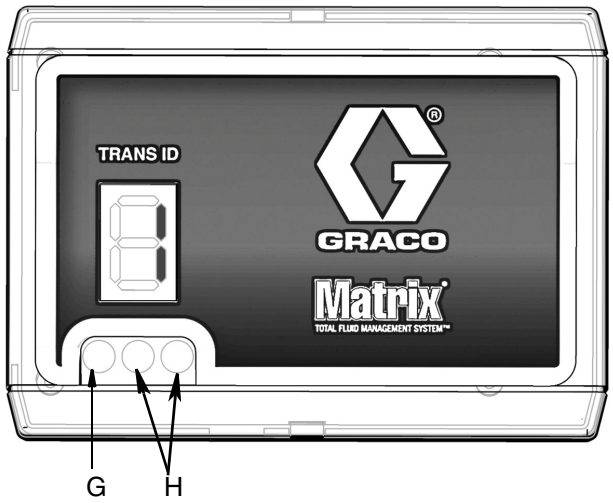


FIG. 13

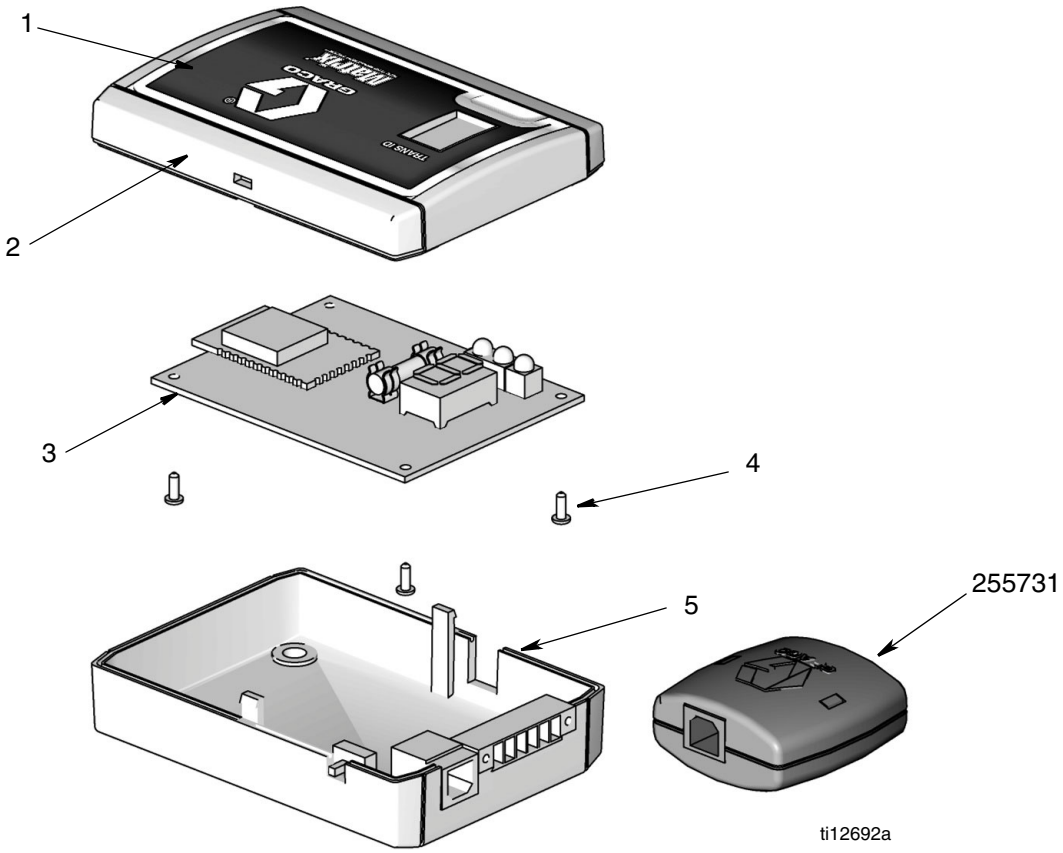
Transceiver See FIG. 13

Function	Description
Power - Green light (G)	When lit, indicates the unit is receiving AC power.
PC IN/PC OUT - Red flashing lights (H)	Flashing lights indicate transmission from the PC to the Transceiver and Transceiver to PC..

Transceiver Diagnostics

Indicator	Diagnostic Definition
No green power light (G)	Indicates that AC power is not connected. Verify that the power cord is securely plugged into the component and the AC power outlet.
	Verify that the AC power outlet is "live".
Red communication lights do not flash (H)	Indicates that the PC is not communicating with the Transceiver. Verify that the USB cable is securely plugged into the Transceiver and the communications port of the PC.
	Indicates that the Transceiver is not communicating to the PC when receiving information from other Matrix components. Verify USB cable is securely plugged into the Transceiver and the communications port of the PC. If so, replace Transceiver.

Transceiver Parts



Ref. No.	Part No.	Description	Qty
1	15K769	LABEL, ID, Matrix transceiver	1
2	15K747	COVER, transceiver	1
3	255174	BOARD, circuit assembly	1
4	120174	SCREW, panhead #2	4
5	15K756	BASE, transceiver, cover	1
6	15K770	LABEL, transceiver (not shown)	1

Accessories

Part No.	Description
255731	CONVERTER, USB to RS422
119572	CABLE, RS422, 1000 ft (305 m)
15T999	CABLE, USB, 16.4 ft (5 m)
15T998	CABLE, USB, 3.28 ft (1 m)

Troubleshooting

Problem	Cause	Solution
Transceiver will not communicate to meters and TLMs	Incorrect Transceiver ID selected	Ensure correct Transceiver ID is selected.
	USB cable is not connected between the transceiver and PC.	Verify that USB cable connects transceiver to PC correctly. See page 6.
	Transceiver is not powered up.	Verify transceiver is powered up.
	Transceiver is out of RF range of meters or TLMs.	Ensure transceiver is located within RF range of meters and TLMs.
Transceiver communicates intermittently to some meters and TLMs.	Transceiver is out of RF range of meters or TLMs.	Ensure transceiver is located within RF range of meters and TLMs.

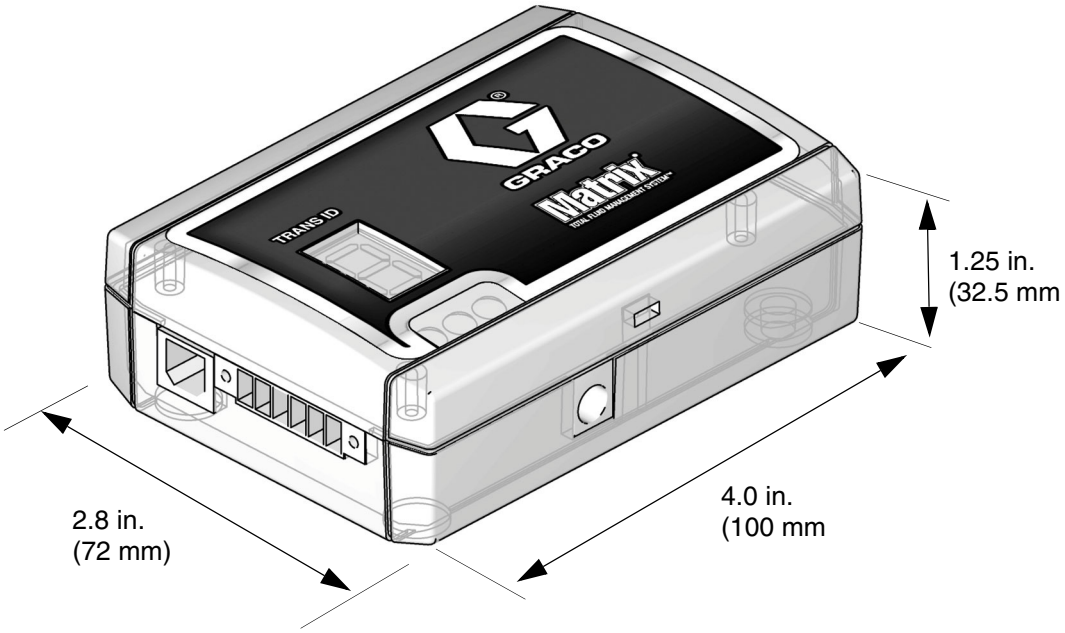
Technical Data

Transceiver

Weight	1.0 lbs. (454 g)
RF Communication	2.40 GHz
Unobstructed RF Range (based on building construction and RF environment)	300 to 500 ft (91.4 to 152.4 m)
Obstructed RF Range (based on building construction and RF environment)	250 to 300 ft (76.2 to 91.0 m)
RF Operating Temperature Range	-40°F to 185°F (-40°C to 85°C)
Power Supply	+9VDC
FCC ID	FCC (TFB-FREESTAR), IC - Industry Canada (5969A-FREESTAR), N.A.
C-Tick Compliance	ACMA NI4939-FREESTAR, Australia

These devices comply 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.

Dimensions



Notes

Graco Transceiver Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twenty-four months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

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For the latest information about Graco products, visit www.graco.com.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.
Phone: 612-623-6928 **or Toll Free:** 1-800-533-9655, **Fax:** 612-378-3590

All written and visual data contained in this document reflects the latest product information available at the time of publication.
Graco reserves the right to make changes at any time without notice.

For patent information, see www.graco.com/patents.

Original instructions. This manual contains English. MM 213008

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