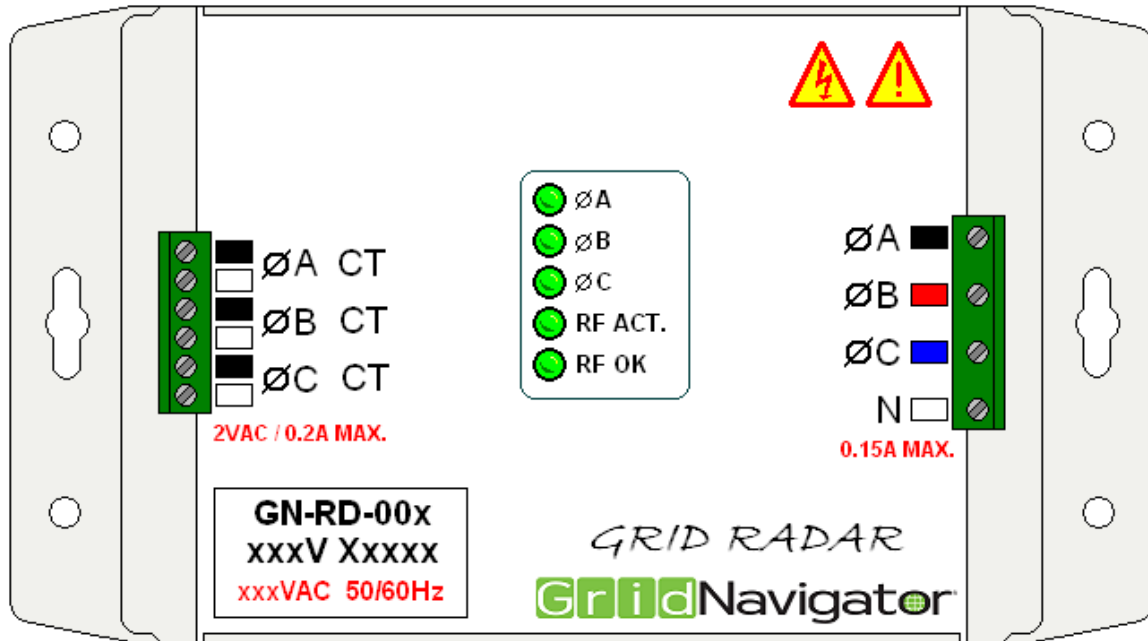


GridNavigator®

Grid Radar Installation Manual



MODELS

- GN-RD-001** 120V Single Phase / Wye, 240V Single Phase, with Neutral
- GN-RD-002** 277V 3-Phase Wye, with Neutral
- GN-RD-003** 480V 3-Phase Delta, no Neutral
- GN-RD-004** 208V / 240V Single Phase, no Neutral

Grid Navigator
200 Varick St. Suite 508
New York, NY 10014
www.gridnavigator.com
support@gridnavigator.com
866 654 8007

SYMBOLS



Read, understand, and follow all instructions, including warnings and precautions before installing and using this product.



Potential Shock Hazard from Dangerous High Voltage.

PRECAUTIONS

- Only qualified personnel or licensed electricians should install the Grid Radar.
- Follow all applicable local and national electrical and safety codes.
- More than one disconnect switch may be required to de-energize the equipment before servicing.
- The terminal block screws are not insulated. Do not contact metal tools to the screw terminals if the circuit is energized.
- Verify that circuit voltages and currents are within the proper range for the Grid Radar model.
- Use only Grid Navigator supplied or recommended current transformers.
- Protect the line voltage conductors to the Grid Radar with fuses or circuit breakers (not needed for Neutral).
- Equipment must be disconnected from the hazardous live voltage before access.
- If the Grid Radar is not installed correctly, the safety protections may be impaired.

OVERVIEW

Grid Navigator's Grid Radar device is a wireless three-phase sub-meter that accurately reports the energy consumption of a three-phase, or single phase load. The wireless feature allows easy installation and integration with Grid Navigator's HVAC and lighting systems. The Grid Radar includes current transformers that are factory calibrated to measure active energy over a wide range of current fluctuation with less than 1% error.

The three-phase design allows system managers to measure the active, reactive, and apparent energy usage by monitoring each phase.

When integrated with Grid Navigator's intelligent wireless control system, the Grid Radar provides facility managers with the critical information necessary to provide occupants' comfort, to accurately program energy usage, and to ensure maximum energy savings.

KEY FEATURES

FEATURE	BENEFIT
Wireless Communication	<ul style="list-style-type: none">• Easy installation for new buildings or for retrofits.• Wireless connection through Grid Navigator Bridge.• Allows remote reporting and alerting.• No wires to pull through walls or conduit.
Digital Calibration	<ul style="list-style-type: none">• Accurate reporting with less than 1% error in active energy measurement over a wide current dynamic range.
Calibrated clamp-on current transformers	<ul style="list-style-type: none">• Radar package includes all parts required for a complete installation.• Pre-testing ensures accuracy of the entire system.
120VAC to 480VAC, Wye or Delta configurable	<ul style="list-style-type: none">• Suitable to a wide variety of HVAC, Lighting, or other installations.
Three phase system	<ul style="list-style-type: none">• Supplies critical information by monitoring phase voltage from each phase to neutral:<ul style="list-style-type: none">- Active energy- Reactive energy- Apparent energy
Simultaneous RMS calculation on six analog inputs: <ul style="list-style-type: none">- 3 AC inputs- 3 current sensors	<ul style="list-style-type: none">• Reports detailed system performance for:<ul style="list-style-type: none">- Peak voltage and current detection- SAG line voltage detection- Reverse power detection (active and reactive)- Line period or frequency
LED Indicators	<ul style="list-style-type: none">• Displays status of the 3 voltage phases plus RF connection and RF activity.

ELECTRICAL SERVICE TYPES AND RADAR MODEL NUMBERS

Electrical Service Type	Line to Neutral (VAC)	Line to Line (VAC)	Radar Power Source	Radar Model Number
1 Phase 2 Wire 120V with Neutral	108 - 132	n/a	ØA and N	GN-RD-001
1 Phase 3 Wire 120 / 240V with Neutral	108 - 132	216 - 264	ØA and N	GN-RD-001
1 Phase 2 Wire 208V no Neutral	n/a	187 - 229	ØA and ØB	GN-RD-004
1 Phase 2 Wire 240V no Neutral	n/a	216 - 264	ØA and ØB	GN-RD-004
3 Phase 4 Wire Wye 120V with Neutral	108 - 132	187 - 229	ØA and N	GN-RD-001
3 Phase 3 Wire Delta 208V no Neutral	n/a	187 - 229	ØA and ØB	GN-RD-004
3 Phase 4 Wire Wye 277V with Neutral	249 - 305	432 - 528	ØA and N	GN-RD-002
3 Phase 3 Wire Delta 480V no Neutral	n/a	432 - 528	ØA and ØB	GN-RD-003

SPECIFICATIONS

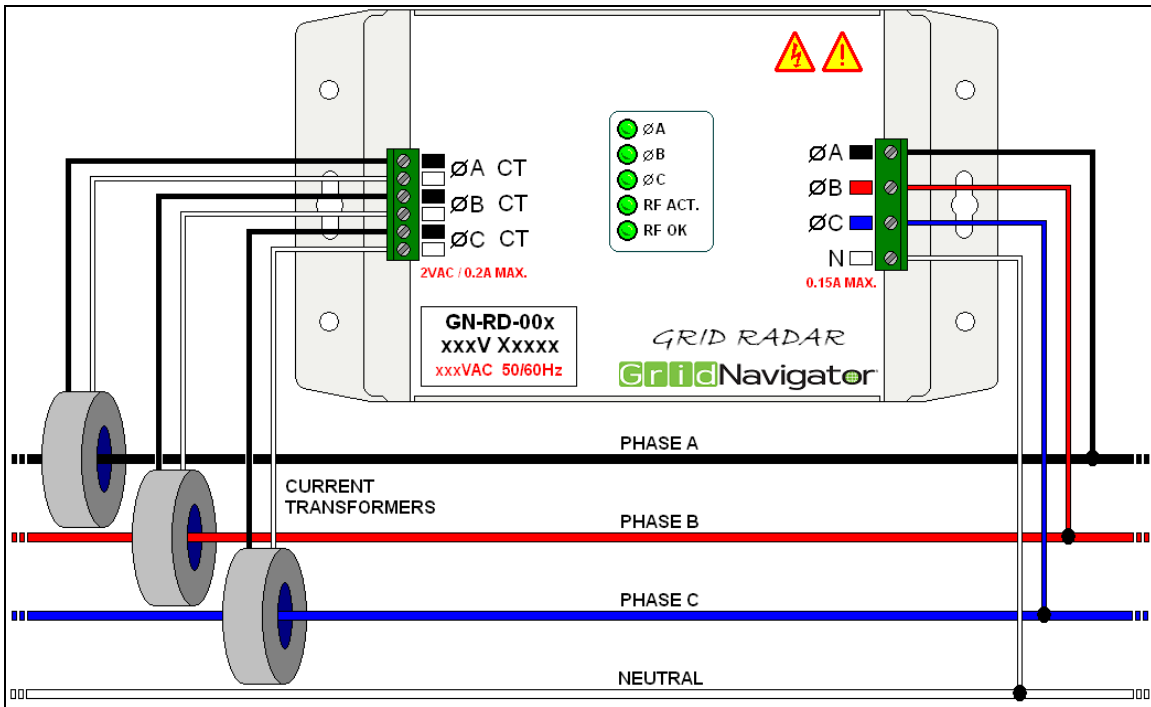
POWER	Powered from Internal Power Supply connected to sensed line voltage. +/- 10% of nominal. 150mA max.
OPERATING CONDITIONS	-40 to +65 C 0% to 90% RH
STORAGE CONDITIONS	-40 TO +90 C
RF INTERFACE	2.4GHz 802.15.4 +19dBm
RF RANGE	Up to 1000 ft. depending on architecture
HOUSING	Polycarbonate UL94-V0 UL508 Approved
5 LED INDICATORS	3-Phase Voltage Status, RF connection, RF activity
DIMENSIONS	8.692" x 4.755" x 2.461
WEIGHT	tbd

INSTALLATION

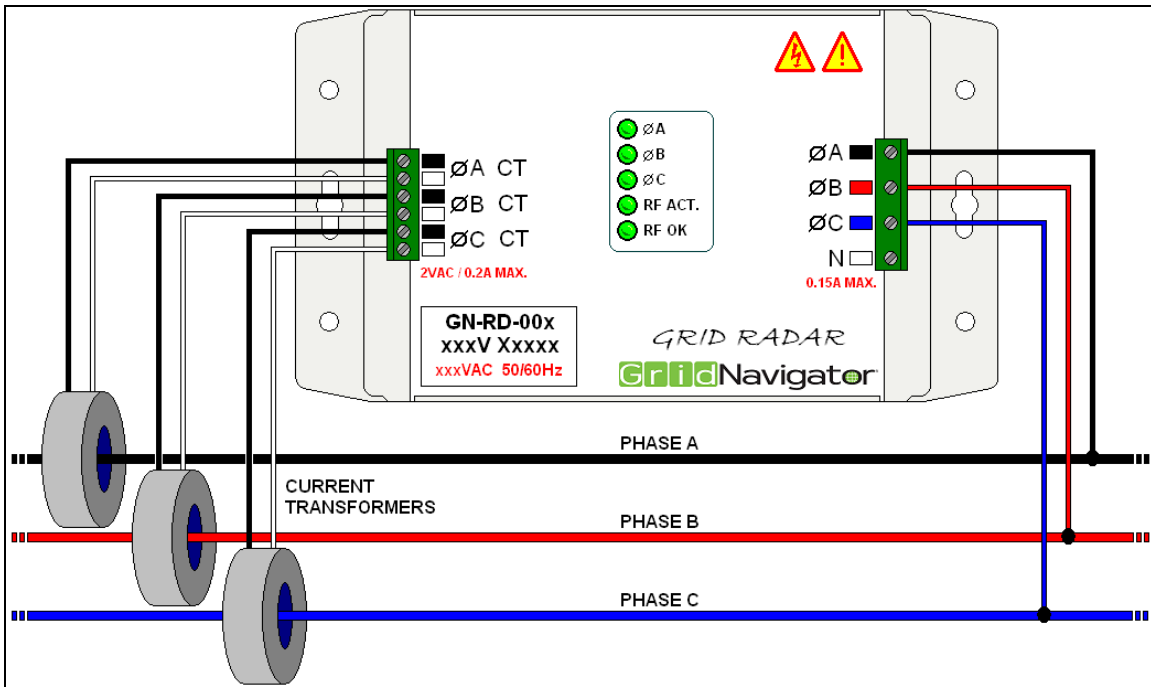
This device is to be installed by a qualified electrician, and must follow all applicable national and local regulations. This unit, and the associated current transformers, must be installed inside an electrical panel only, and will not be accessible during operation of the device. Use appropriate sheet metal screws, and mount the unit using the pre-drilled mounting flanges. Insure the device model number is appropriate for the intended installation with regard to the voltage and wye/delta configuration. Do not position the Grid Radar so as to make accessing the disconnect device difficult. The disconnecting device must be marked accordingly and easily reached.

CONNECTION

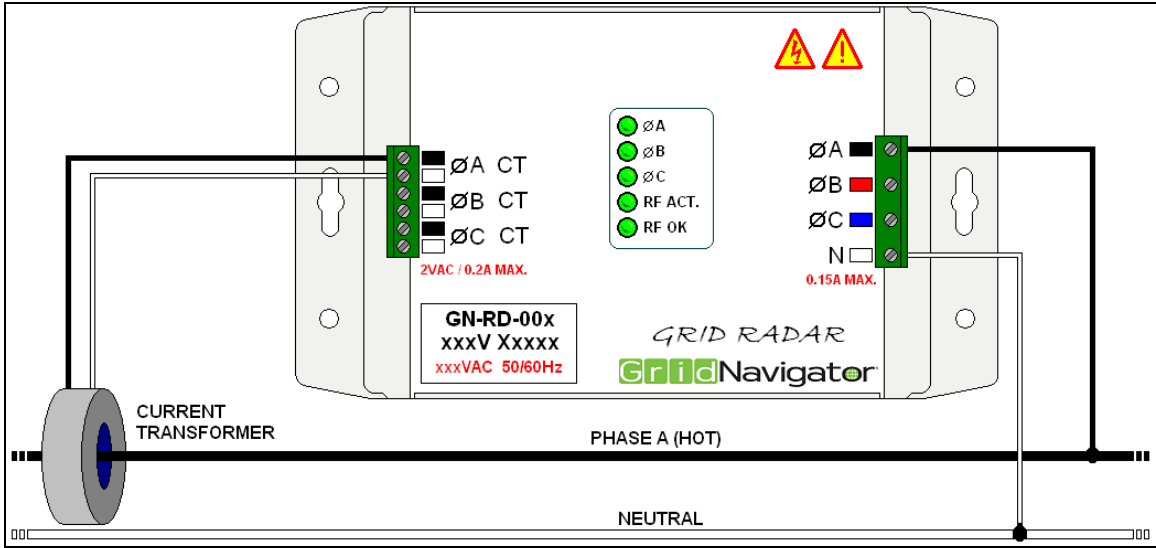
Refer to the following diagrams for connecting the Grid Radar.



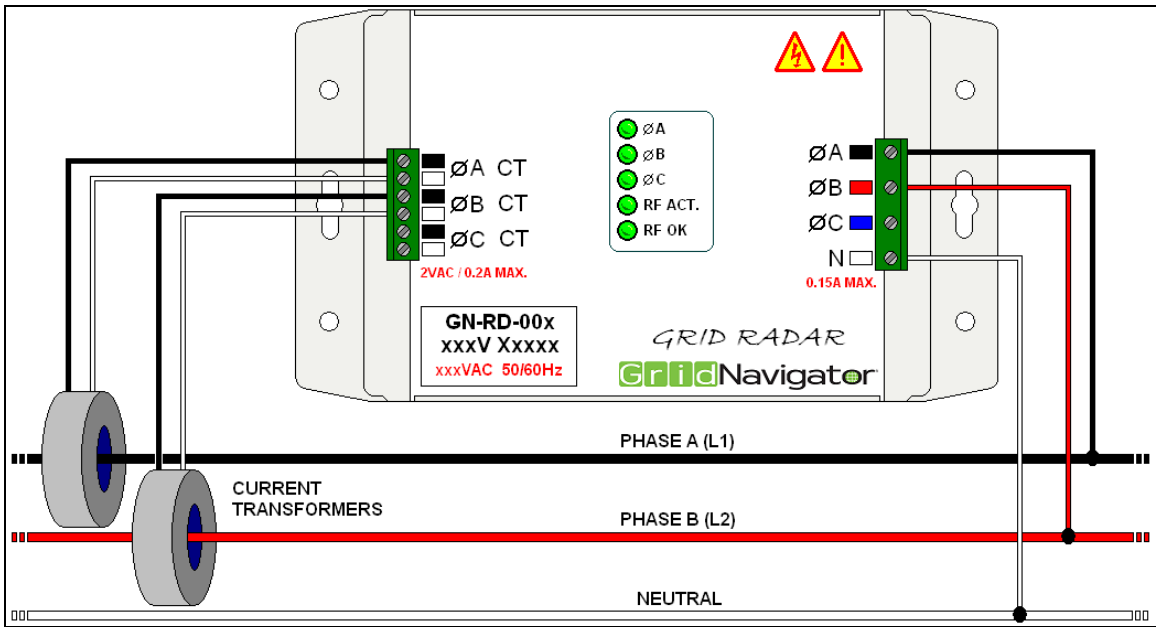
3-PHASE 4-WIRE WYE CONNECTION WITH NEUTRAL



3-PHASE 3-WIRE DELTA CONNECTION NO NEUTRAL



SINGLE PHASE 2-WIRE CONNECTION WITH NEUTRAL



SINGLE PHASE 3-WIRE CONNECTION WITH NEUTRAL

INTERNAL CONNECTORS

J2, J3, and J4 are for Grid Navigator in-house testing purposes only, and are not to be used by the end user. Never attempt to connect anything to these connectors when the unit is powered.

CURRENT TRANSFORMERS

Only the supplied current transformers, or those recommended by Grid Navigator may be used. The current transformer must be rated for the desired measurement voltage, and the ratio must be such that no more than 0.2A is supplied to the Grid Radar input when measuring the maximum current.

Supplied transformer(s):

LEM TT 100-SD

Maximum current: 100A

Output current at 100A: 0.033A

Isolation: 300V (Note: Insulated wire must be used above this voltage)

For more detailed information on the supplied current transformer(s), please refer to the included factory data sheet.

LED INDICATORS

LED	CONDITION	DEFINITION
ØA	OFF	No Voltage present on Phase A
	ON	Voltage present on Phase A and within specs
	BLINKING	Voltage present on Phase A but not within specs
ØB	OFF	No Voltage present on Phase B
	ON	Voltage present on Phase B and within specs
	BLINKING	Voltage present on Phase B but not within specs
ØC	OFF	No Voltage present on Phase C
	ON	Voltage present on Phase C and within specs
	BLINKING	Voltage present on Phase C but not within specs
RF ACT.	OFF	No RF activity
	BLINKING	RF activity
RF OK	OFF	No RF signal detected from Bridge
	ON	RF signal detected from Bridge

MAINTENANCE AND REPAIR

The Grid Radar requires no maintenance or field calibration. It is not user serviceable and there are no replacement parts except the pluggable screw terminals. There are no diagnostic tests that can be performed by the user. In the event of any failure, the unit must be returned to Grid Navigator for service. An RMA must be obtained from Grid Navigator before the unit is returned. The shipping information will be supplied by Grid Navigator with the RMA number.

Contact information: support@gridnavigator.com or 866 654 8007

Mailing Address:
Grid Navigator
200 Varick St. #508
New York, NY 10014

RISK ASSESSMENT

Risk Analysis	Risk Mitigation	Risk	Other factors to mitigate risk
Risk of electrical shock	The Grid Radar is only to be installed by a qualified electrician or installer. The Grid Radar product is not user serviceable.	Low	User manual is detailed and provides necessary safety warnings.
Risk of damage to the unit	If the unit is hooked up incorrectly it will not report the proper power data. The unit will not be harmed under this condition due to the product design.	Low	User Manual provides proper instructions for correct installation.
Risk of power fail event	If the power fails the unit is no longer functional. When power is restored the unit returns to normal operation.	Low	Robust product design ensures that the unit will return to normal operation when power has been restored to the unit.
Risk of Over-voltage Condition	The unit is protected by varistors and resettable fuses. A sustained overvoltage condition will require that the unit be returned to the factory for repair.	Low	Product is designed to handle temporary overvoltage conditions. Factory serviceable only.
Risk of unit failure	Return to factory for repair, unit is not user serviceable	Low	Factory serviceable only.

FCC ID: W70MRF24J40MDME

The enclosed 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.

WARRANTY

All products sold by GRID NAVIGATOR are guaranteed against defects in material and workmanship for a period of one year from the date of shipment. GRID NAVIGATOR responsibility is limited to repair, replacement, or refund, any of which may be selected by GRID NAVIGATOR at its sole discretion. GRID NAVIGATOR reserves the right to substitute functionally equivalent new or serviceable used parts.

This warranty covers only defects arising under normal use and does not include malfunctions or failures resulting from: misuse, neglect, improper application, improper installation, water damage, acts of nature, lightning, or repairs by anyone other than GRID NAVIGATOR.

Except as set forth herein, GRID NAVIGATOR makes no warranties, expressed or implied, and GRID NAVIGATOR disclaims and negates all other warranties, including without limitation, implied warranties of merchantability and fitness for a particular purpose. Some states or jurisdictions do not allow limitations on implied warranties, so these limitations may not apply to you.

Limitation of Liability:

In no event shall GRID NAVIGATOR be liable for any indirect, special, incidental, or consequential damages. Some states or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.