SPX AIDS TO NAVIGATION

# TECHNICAL BULLETIN

## MON-2697 Generator Communications Installation and Troubleshooting

Technical Support
1.800.821.5825 Option 9
aton.support.obstruction@spx.com

| | |
|---|---|
| Product: | MON-2697 |
| Brand(s): | International Tower Lighting (ITL) |
| Effective Date: | January 25, 2024 |
| Part Affected: | MON-2697-EXT and MON-2697-COM |
| Issued By: | Joshua Crowne, Manager, Systems and Solutions Engineering |

This bulletin is issued to provide a method of procedure for installing a MON-2697 to communicate with a generator. This includes the MON-2697-EXT standalone monitor and the MON-2697-000 integrated monitoring system.

| | |
|---|---|
| MON-2697-COM (Integrated Monitoring System)<br>• Used in LIT and LIT GEN Sites<br>• Can communicate with Generac H100 as well as Kohler MPAC generators |  |
| MON-2697-EXT (Standalone Monitoring System)<br>• Used in GEN Only Sites<br>• Can communicate with Generac H100 as well as Kohler MPAC generators |  |
| MOD-9721-WAP (Wireless Access Point)<br>• Comes with MON-2697-EXT<br>• Provides Wi-Fi access on site to connect to the monitoring system |  |
| MOD-RS485-CNV-107N (RS485 to RS232)<br>• Only needed for RS485 connection to Generac H100 generators<br>• Comes in KIT-9700-GEN-LR<br>• This could be an ATC-107N or an ATC-108N |  |
| POE-9700-GEN (Passive POE Injector)<br>• Installed in the generator.<br>• Only needed on LIT GEN sites<br>• Provides AUX power to the monitoring system. |  |

## TABLE OF CONTENTS

## PRE-INSTALL INSTRUCTIONS

When arriving on or off the site you must call the American Tower NOC. This must be done when arriving on site and leaving the site for the day. This is not optional; not completing this step may have the construction crew removed from the site permanently.

### TOWER LIGHTING SYSTEM PRE-INSTALL

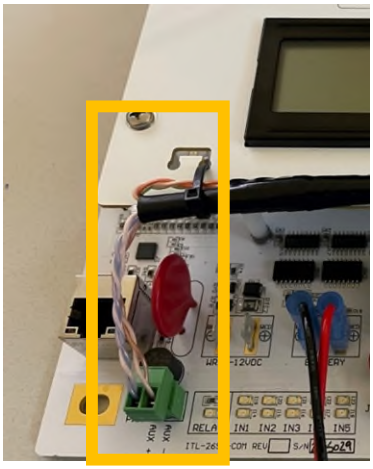
1. Upon arriving on site, prior to any construction or power down of any tower lighting equipment; confirm with the ATC NOC the condition of the tower lighting systems.
2. Upon powering down any tower lighting system, for any reason, contact the ATC NOC and request to have a NOTAM (Notice to Airmen) opened. Once open, the tower lighting system may be powered down.
3. After all work is completed or leaving the site for the day; if able, restore power to tower lighting system and test with the ATC NOC. The NOTAM can be closed if the tower light work is completed.
4. **Do not leave a tower light in a lights out condition without having a NOTAM opened with the ATC NOC.**

### GENERATOR AND ATS PRE-INSTALL

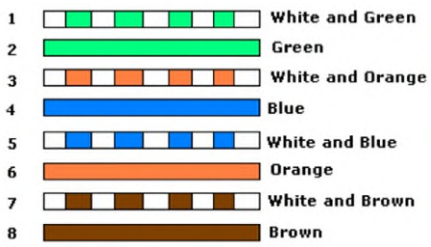
1. Upon arriving on site, prior to any construction or power down of any generator or ATS equipment; confirm with the ATC NOC the condition of the generator systems.
2. After all work is completed or leaving the site for the day; if able, restore power to the generator systems and test with the ATC NOC.
3. Do not leave a generator or ATS in a manual mode unless specifically directed to do by the ATC NOC.

## AUXILIARY POWER CONNECTION

1. Utilizing Ethernet cable (Installer Supplied) at the MON-2697
    a. Connect Blue and White/Blue to the AUX+ connection on J6.
    b. Connect Brown and White/Brown to the AUX- connection on J6.
2. Wrap all unused Ethernet wires around the cable and tape with electrical tape.
3. Secure the Ethernet cable to the MON-2697 with a zip tie as shown.

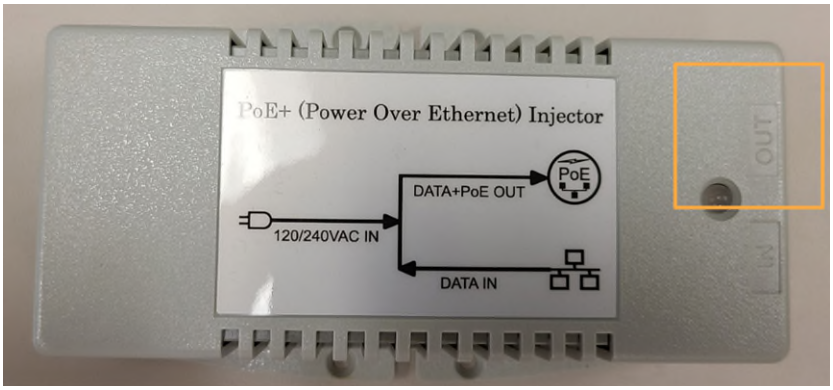


4. Utilizing Ethernet cable (Installer Supplied) at the Generator
    a. Verify that the wiring to the RJ45 connector is wired to the TIA/EIA 568A wiring standard.

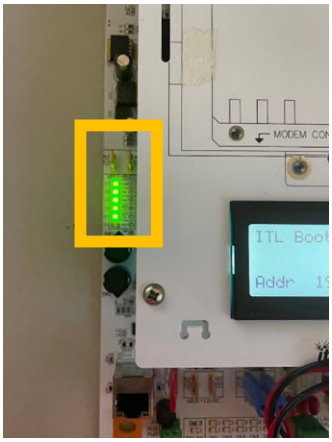




    b. Install the POE injector power cable to the generator AC outlet and connect the other end of the power cable to the POE injector.
    c. Connect the Ethernet cable to the POE injector 'OUT' port.
    d. Verify that the POE injector is powered by verifying that the green LED is lit.



5. Verify that the MON-2697-COM is powered by the POE injector.
    a. Remove the main power by unplugging J1 on the top right of the board.
    b. Remove the positive lead (RED) from the backup battery output.
    c. The board should stay on including the LCD and green status LEDs on the left side of the board.



## GENERAC RS232 COMMUNICATION CONNECTION

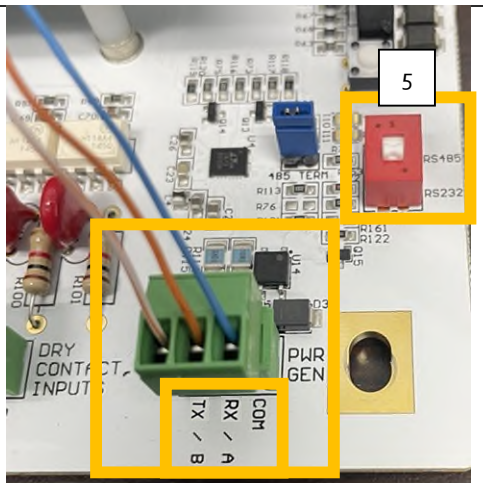
### ON-SITE INSTALLATION (GENERAC GENERATOR SIDE)

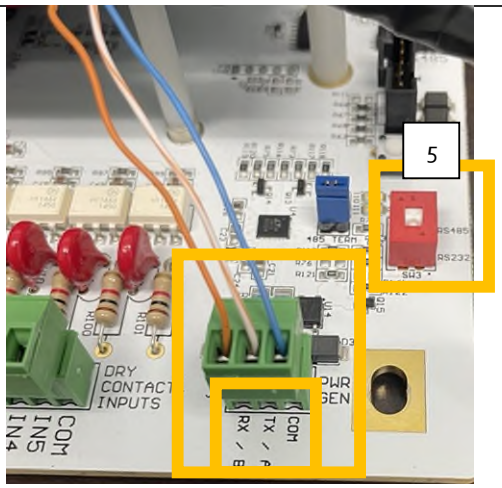
1. Install the RJ45 to DB9 Adaptor to the Generac H100 serial connection.
2. Connect the RJ45 of the Ethernet cable to the RJ45 to DB9 Adaptor.


### ON-SITE INSTALLATION (MON-2697 SIDE)

1. Strip approximately 2" of the outer jacket from the Ethernet cable and un-twist the pairs
2. Connect the Ethernet cable wires to the MON-2697 phoenix connector on J5. There are two versions of this connection. Please see the chart below for instructions and color coding.

****To determine the board revision you must use the silkscreen below ****




| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| WHT/ORG | ORG | BLU | ORG | WHT/ORG | BLU |

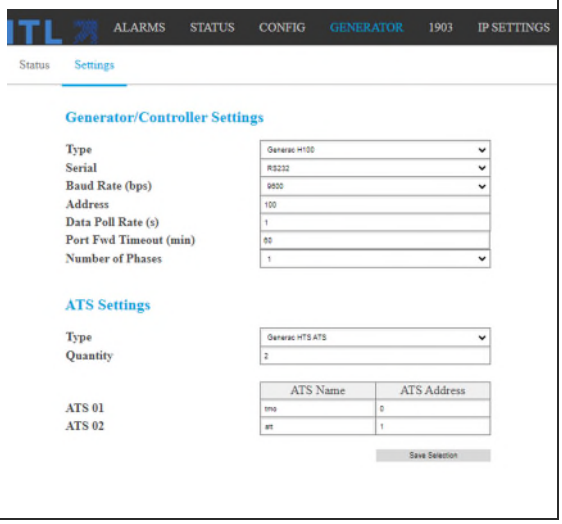
3. Plug the phoenix connector back into J5.
4. Wrap all unused Ethernet wires around the cable and tape with electrical tape.
5. Make sure the red switch SW3 is set to RS232 (Down Position).
   Secure Ethernet cable to the MON-2697-COM board with a zip tie to alleviate stress on the phoenix connectors.

## NOC CONFIGURATION

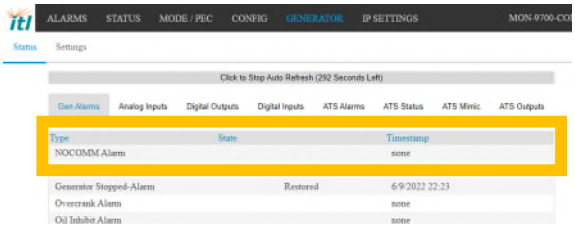
1. Navigate to the *Status > Monitoring Panel* webpage.
    a. Verify that the firmware version is **3.50 or higher.**
    b. If it is not, you will have to update the firmware to at least 3.50 utilizing the MON Finder utility.
    c. Instructions for this are on a separate document.


2. Navigate to the *Generator > Settings* webpage.
3. Set the 'Generator/Controller Settings' and the 'ATS Settings' as below.

| **Generator/Controller Settings** | |
|---|---|
| **Type** | Generac H100 |
| **Comm Type** | RS232 |
| **Baud Rate** | 9600 |
| **Address** | 100 |
| **Data Poll Rate** | 1 |
| **Port Fwd Timeout** | 10 |
| **ATS Settings** | |
| **Type** | Generac HTS ATS |
| **Quantity** | ***NUMBER_OF_ATS_ON_SITE*** |
| | |
| **Name** | ***NAME_OF_ATS*** |
| **Address** | ***ZERO_INDEX_ADDRESS*** |



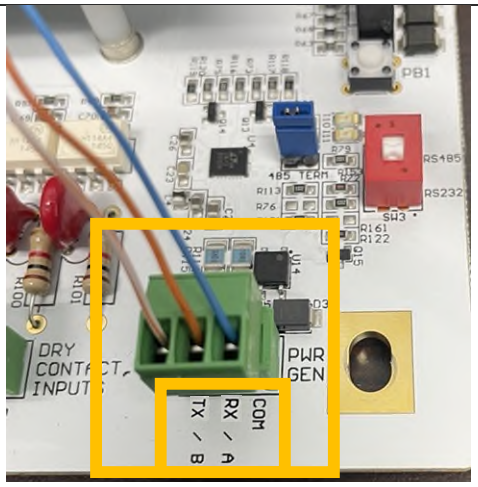

4. Navigate to the *Generator > Status* webpage.
    a. Is the NOCOMM alarm active and highlighted in **red**?
        i. Have the installer verify all wiring is correct and secure according to this guide.
        ii. If not successful have the installer troubleshoot using GENERAC RS232 COMMUNICATION TROUBLESHOOTING.
        iii. If not successful, please call SPX tech support for assistance.
    b. Is the NOCOMM alarm **not** active and **not** highlighted in **red**?
        i. The system is communicating **successfully,** and you can proceed with any further generator testing needed.

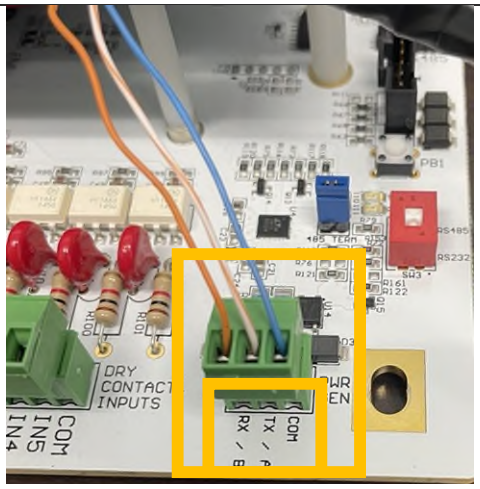


## GENERAC RS232 COMMUNICATION TROUBLESHOOTING

1. Verify that the generator settings are correct by following the instructions here: Generac RS232 Communication Connection > NOC Configuration
    a. If there is still a generator No Comm alarm Continue
2. Remove J5 (PWR GEN) from the MON-2697 board.
3. Does I10 (TXD) flash once per second?
    a. Yes – Continue
    b. No – Replace or Repair the MON-2697
4. Place a jumper between the first and second positions and plug it into J5.
5. Do I10 (TXD) and I11 (RXD) flash once per second?
    a. Yes – Continue
    b. No – Replace or Repair the MON-2697
6. Remove the jumper from the previous steps.
7. Connect the Ethernet cable wires to the MON-2697 phoenix connector on J5. There are two versions of this connection. Please see the chart below for instructions and color coding.

****To determine the board revision you must use the silkscreen below ****




| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| WHT/ORG | ORG | BLU | ORG | WHT/ORG | BLU |

8. If there is still a No Comm generator alarm the most likely issue is with the Generac generator control board.

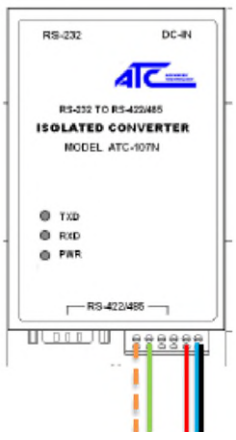
## GENERAC RS485 COMMUNICATION CONNECTION

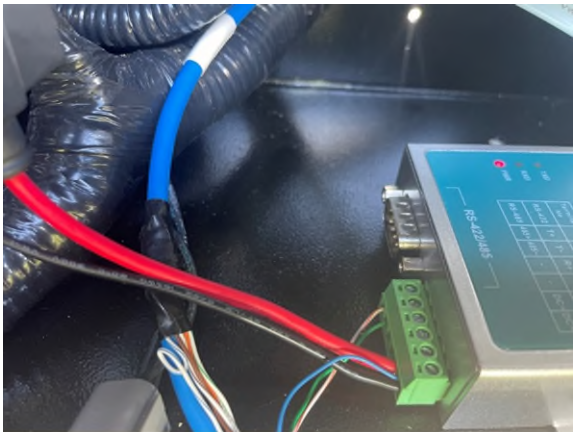
### ON-SITE INSTALLATION (GENERAC GENERATOR SIDE)

1. Install the DB9 of the blue serial cable to the Generac H100 serial connection.

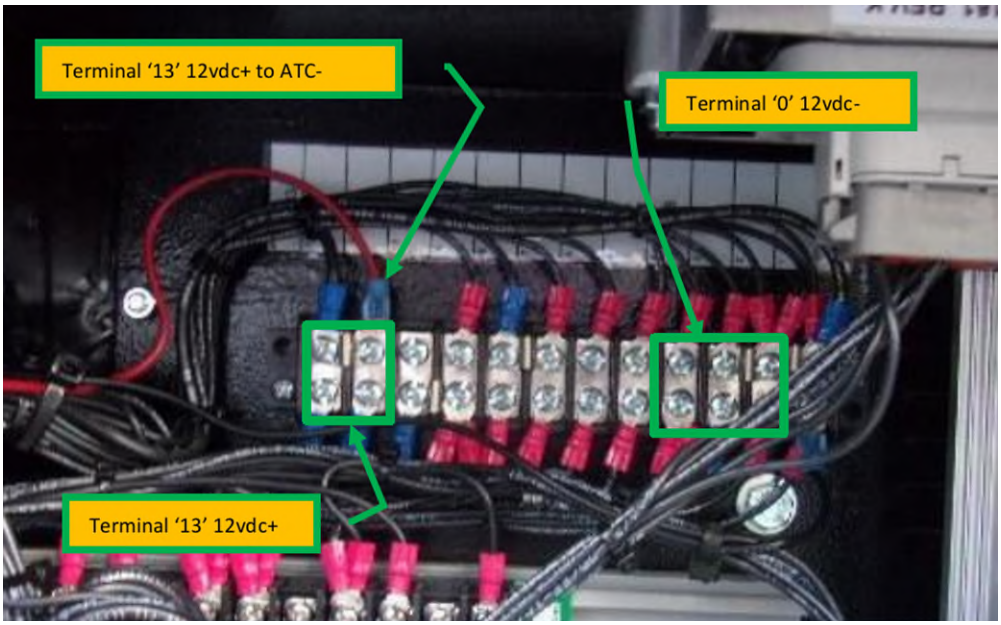

2. Route the blue serial cable as well as Ethernet cable (Installer Supplied) to the back of the generator panel.

3. Connect the RJ45 of the blue serial cable to the back of the ATC-107N or ATC-108N adaptor.
4. Strip approximately 2" of the outer jacket from the Ethernet cable and un-twist the pairs.
5. Connect the Ethernet cable wires to the ATC-107N or ATC-108N phoenix connector.
    a. White/Orange to position 1 (RS485+)
    b. Green to position 2 (RS485-)
    c. Blue to position 6 (DC-)
6. Wrap all unused Ethernet wires around the cable and tape with electrical tape.

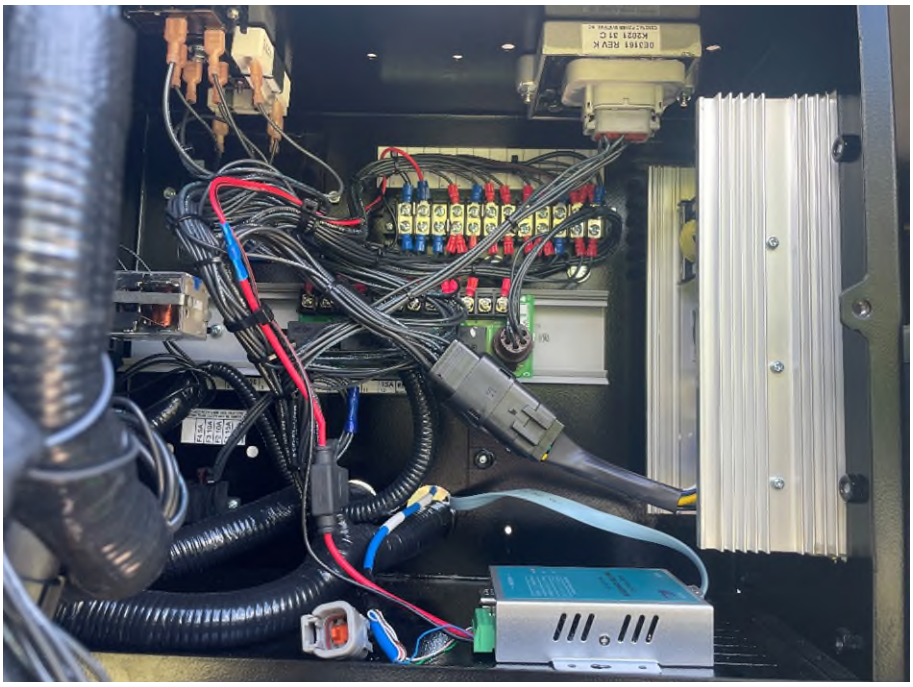


7. Connect the black power wire (DC-) to the generator terminal block TB3 on Position '0'.
8. Connect the red power wire (DC+) to the generator terminal block TB3 on Position.
    a. On 12V systems, 'DC+' will be labeled '13'or '15'.
    b. On 24V systems, 'DC+' will be labeled '218'or '220'.



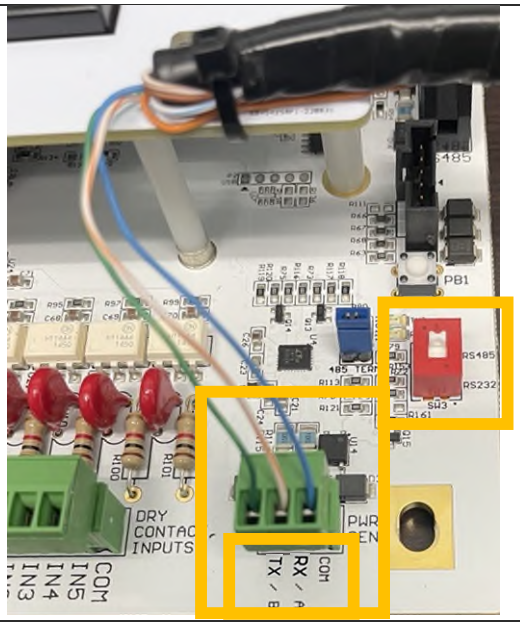

9. Verify that the ATC-107N power LED is lit red.
10. Mount the ATC-107N at the bottom of the cabinet and clean up wiring harness utilizing zip ties.

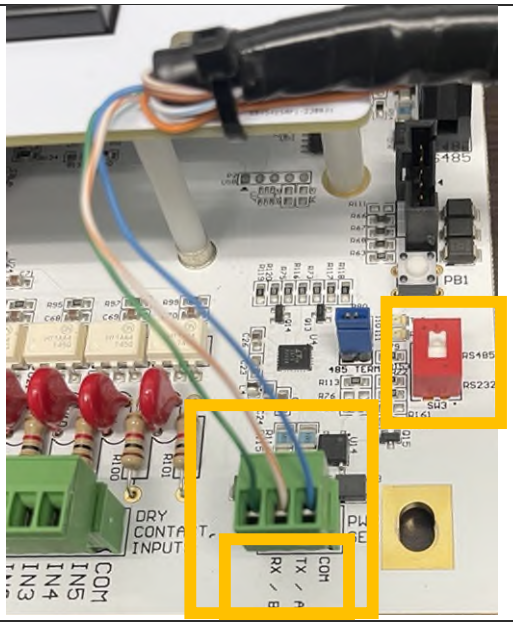


## ON-SITE INSTALLATION (MON-2697 SIDE)

1. Strip approximately 2" of the outer jacket from the Ethernet cable and un-twist the pairs.
2. Connect the Ethernet cable wires to the MON-2697 phoenix connector on J5. There are two versions of this connection. Please note the color code is the same for both revisions but the labeling is different.

****To determine the board revision you must use the silkscreen below ****

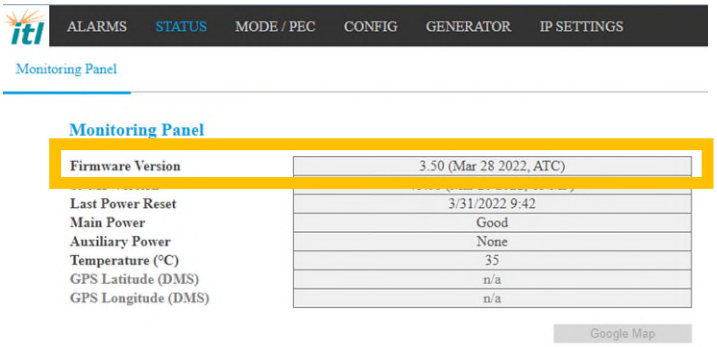



| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| GRN | WHT/ORG | BLU | GRN | WHT/ORG | BLU |

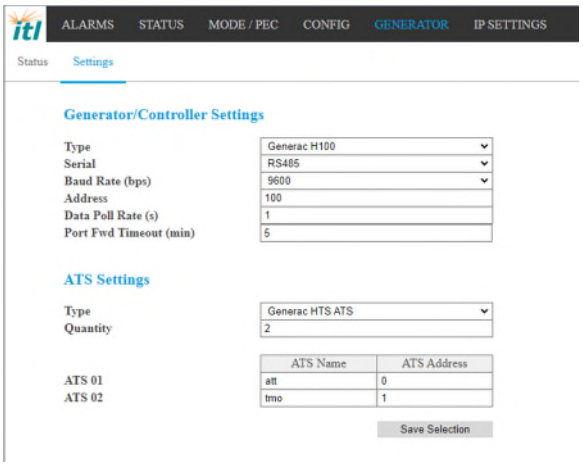
## NOC CONFIGURATION

1. Navigate to the *Status > Monitoring Panel* webpage.
   a. Verify that the firmware version is **3.50 or higher.**
   b. If it is not, you will have to update the firmware to at least 3.50 utilizing the MON Finder utility.
   c. Instructions for this are on a separate document.

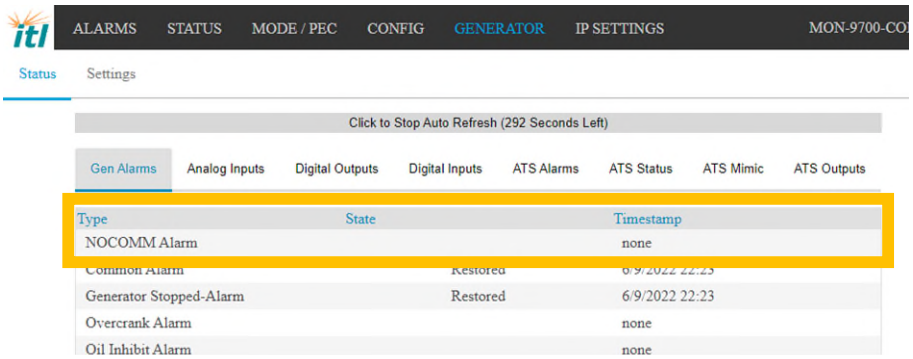


2. Navigate to the *Generator > Settings* webpage.
3. Set the 'Generator/Controller Settings' and the 'ATS Settings' as below.

| **Generator/Controller Settings** | |
|---|---|
| **Type** | Generac H100 |
| **Comm Type** | RS485 |
| **Baud Rate** | 9600 |
| **Address** | 100 |
| **Data Poll Rate** | 1 |
| **Port Fwd Timeout** | 10 |
| **ATS Settings** | |
| **Type** | Generac HTS ATS |
| **Quantity** | ***NUMBER_OF_ATS_ON_SITE*** |
| | |
| **Name** | ***NAME_OF_ATS*** |
| **Address** | ***ZERO_INDEX_ADDRESS*** |




4. Navigate to the *Generator > Status* webpage.
    a. Is the NOCOMM alarm active and highlighted in **red**?
        i. Have the installer verify all wiring is correct and secure according to this guide.
        ii. If not successful have the installer troubleshoot using GENERAC RS485 COMMUNICATION TROUBLESHOOTING.
        iii. If not successful, please call SPX tech support for assistance.
    b. Is the NOCOMM alarm **not** active and **not** highlighted in **red**?
        i. The system is communicating **successfully,** and you can proceed with any further generator testing needed.



## GENERAC RS485 COMMUNICATION TROUBLESHOOTING

1. Verify that the generator settings are correct by following the instructions here: [Generac RS485 Communication Connection > NOC Configuration]
    1. If there is still a generator No Comm alarm Continue
2. Remove J5 (PWR GEN) from the MON-2697 board.
3. Does I10 (TXD) flash once per second?
    1. Yes – Continue
    2. No – Replace or Repair the MON-2697
4. Reconnect J5 (PWR GEN) to the MON-2697 board.
5. Install Loopback Tester or wire jumper between position 2 and 3 on the DB9 end of the blue cable that is connected to the generator.

Loopback Tester NOTE 1

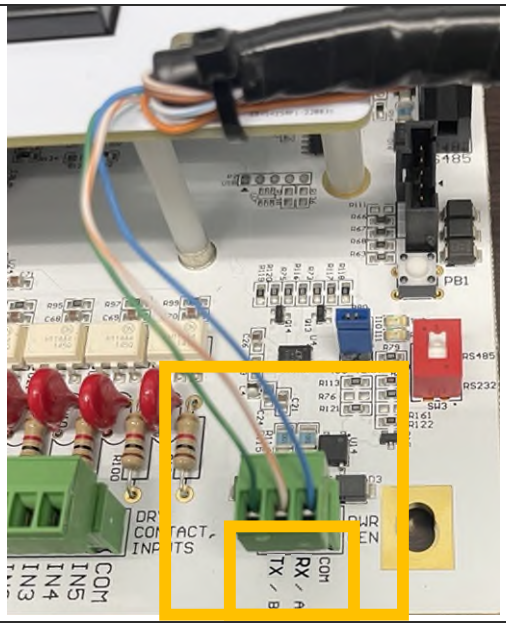
Wire Jumper from position 2 to 3

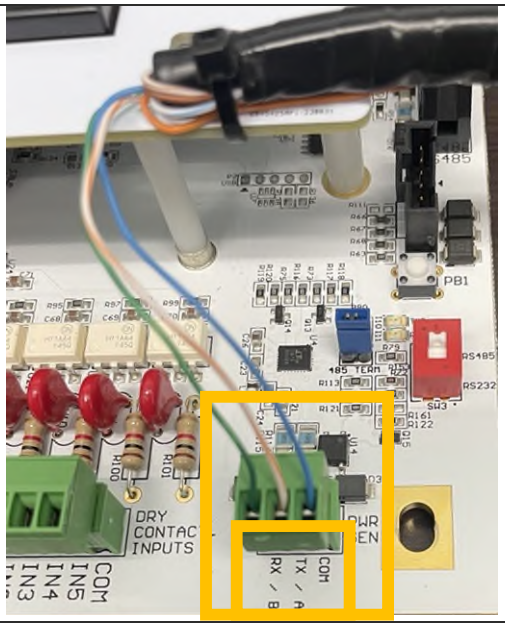
**NOTE 1:** Please see below for links to purchase and setup this loopback tester.

- This DB9 breakout can be purchased from many sites. Some links are below. If these links do not work, you can do a web search for 'male db9 breakout' and find many options.
    - GridConnect RS232 Male Breakout DB9 to Terminal Block
    - Amazon RS232 Male Breakout DB9 to Terminal Block
- To assemble one of these as a loopback tester you will have to connect positions 2(RX) & 3(TX) using a wire jumper.

6. Verify that the CAT5e cable between the MON-2697 and ATC-107N or ATC-108N converter is not damaged and is securely connected. **Use a known good cable if this cannot be verified**.
7. Are the TXD and RXD lights flashing on the ATC-107N or ATC-108N?
    1. Yes – Continue
    2. No – Replace the ATC-107N or ATC-108N converter.
8. Are the green I10(TXD) and I11(RXD) on the MON-2697 flashing once per second? (Pay close attention as these can be hard to see in direct sunlight)
    1. Yes – Continue
    2. No - Replace or Repair the MON-2697
9. Connect the Ethernet cable wires to the MON-2697 phoenix connector on J5. Please see the chart below for instructions and color coding.

****To determine the board revision you must use the silkscreen below ****




| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| GREEN | WHT/ORG | BLU | GREEN | WHT/ORG | BLU |

10. If there is still a No Comm generator alarm the most likely issue is with the Generac generator control board.

## KOHLER RS485 COMMUNICATION CONNECTION

### ON-SITE INSTALLATION (KOHLER GENERATOR SIDE)

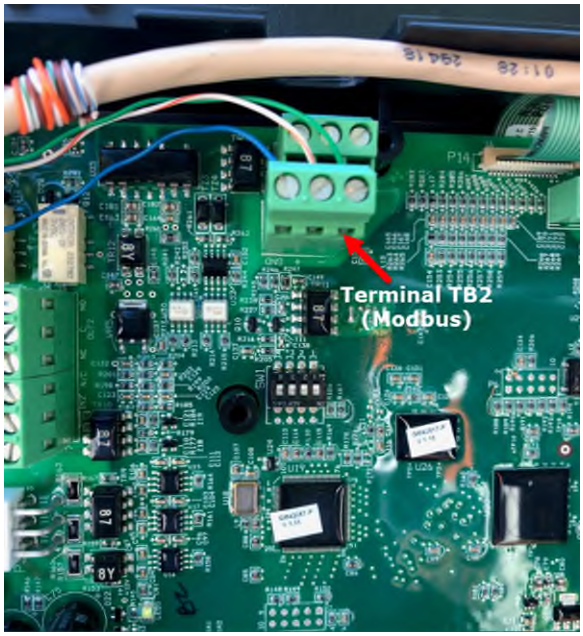
1. Remove the four screws from the Kohler generator panel to access the controller board and verify the wiring on P21 (6-Pin Connector) on the controller board corresponds with the diagram and picture below.

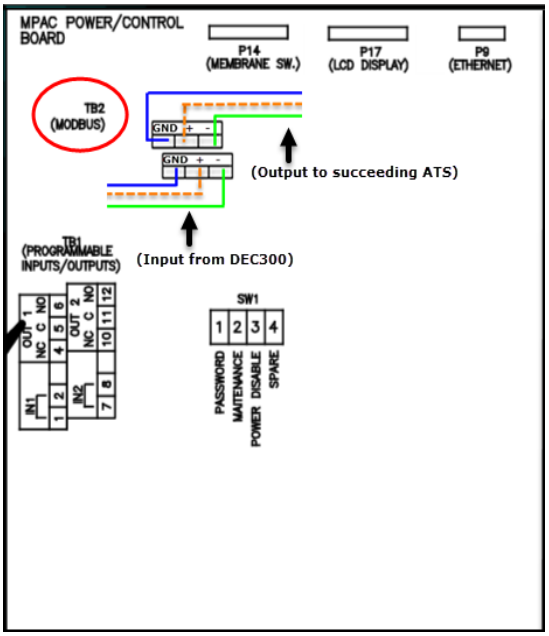
**Four screws hold the controller cover on. The RS485 Connections are behind the controller display.**


**Unlike Generac, Kohler utilizes MODBUS RS485 connections not only from the KBox to the Generator Controller, but also from the Generator Controller to the ATS(s)**


| P21 6-Pin Connector | | | |
|---|---|---|---|
| RS-485 (RSA II) | | | |
| **Terminal** | **Description** | **Connection** | **Input/Output** |
| P21-1 | GND | Blue | Input from KBox |
| P21-2 | (+) | Orange/White | Input from KBox |
| P21-3 | (-) | Green | Input from KBox |
| P21-4 | GND | Blue | Output to ATS |
| P21-5 | (+) | Orange/White | Output to ATS |
| P21-6 | (-) | Green | Output to ATS |

2. Open the Kohler transfer switch to gain access to the control panel board and verify the wiring on TB2 (2x3-Pin Connector) on the controller board corresponds with the diagram and picture below.

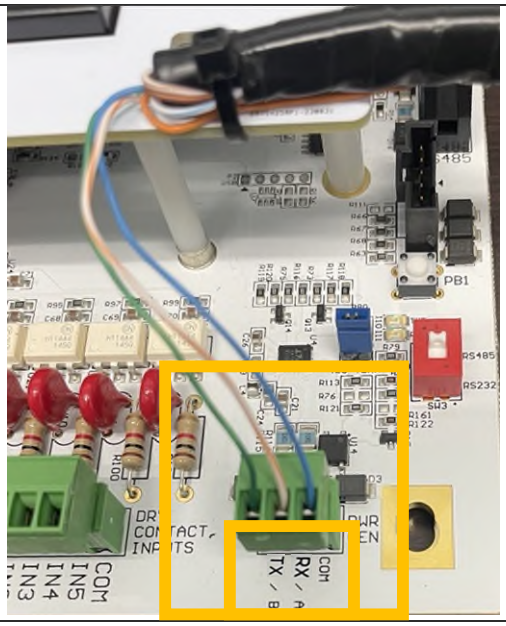


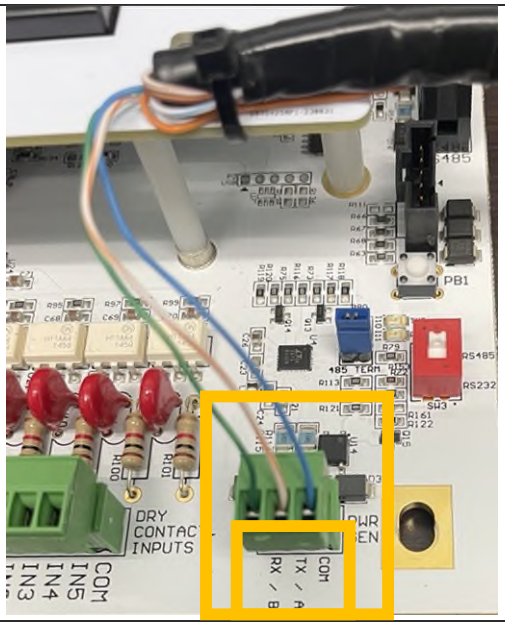



## ON-SITE INSTALLATION (MON-2697 SIDE)

1. Strip approximately 2" of the outer jacket from the Ethernet cable and un-twist the pairs.
2. Connect the Ethernet cable wires to the MON-2697 phoenix connector on J5. There are two versions of this connection. Please note the color code is the same for both revisions but the labeling is different.

****To determine the board revision you must use the silkscreen below ****

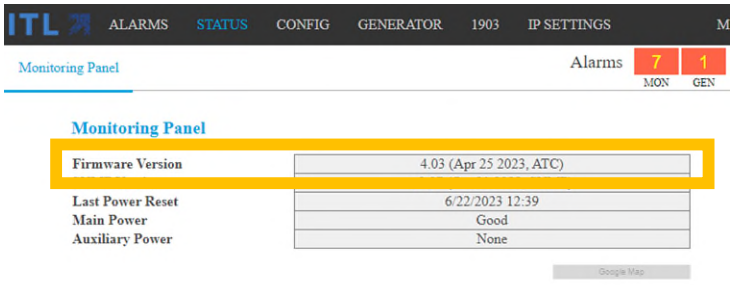



| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| GREEN | WHT/ORG | BLU | GREEN | WHT/ORG | BLU |

## NOC CONFIGURATION

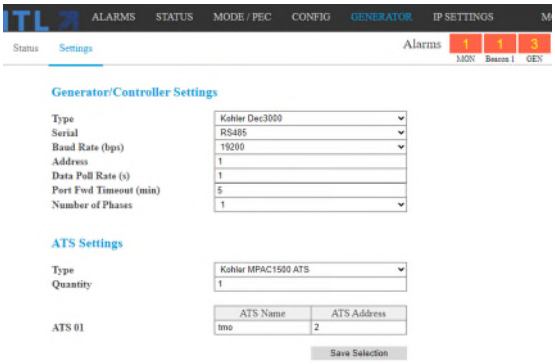
1. Navigate to the *Status > Monitoring Panel* webpage.
   a. Verify that the firmware version is **4.02 or higher.**
   b. If it is not, you will have to update the firmware to at least 3.50 utilizing the MON Finder utility.
   c. Instructions for this are on a separate document.



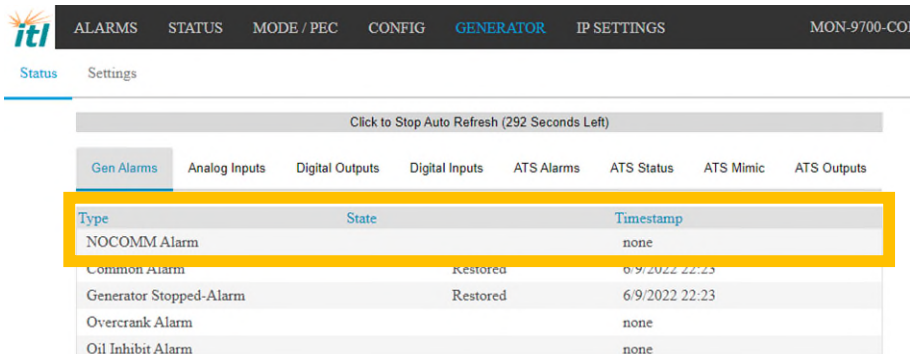

2. Navigate to the *Generator > Settings* webpage.

3. Set the 'Generator/Controller Settings' and the 'ATS Settings' as below.

| Generator/Controller Settings | |
|---|---|
| **Type** | Kohler DEC3000 |
| **Comm Type** | RS485 |
| **Baud Rate** | 19200 |
| **Address** | 1 |
| **Data Poll Rate** | 1 |
| **Port Fwd Timeout** | 10 |
| **ATS Settings** | |
| **Type** | Kohler MPAC1500 ATS |
| **Quantity** | ***NUMBER_OF_ATS_ON_SITE*** |
| | |
| **Name** | ***NAME_OF_ATS*** |
| **Address** | ***INDEX_STARTING_AT_2*** |

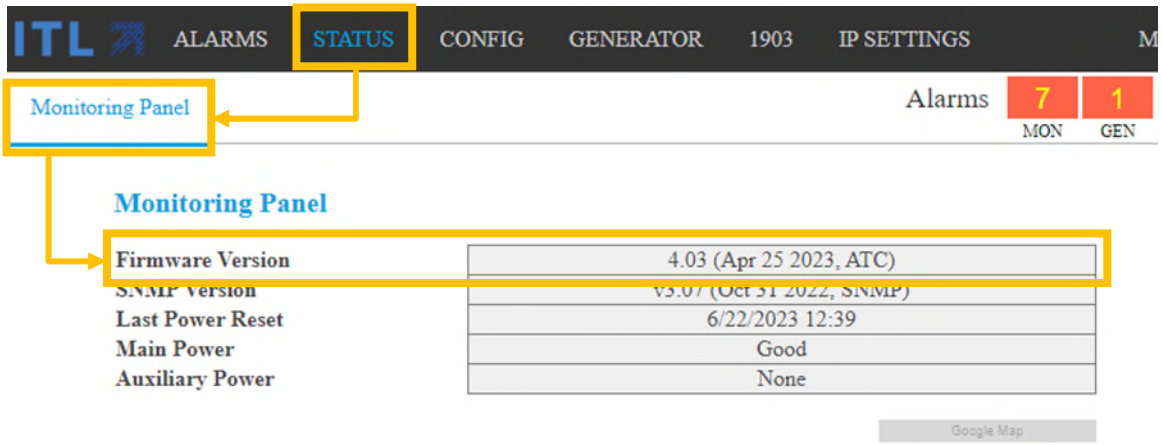



4. Navigate to the *Generator > Status* webpage.
   a. Is the NOCOMM alarm active and highlighted in **red**?
      i. Have the installer verify all wiring is correct and secure according to this guide.
      ii. If not successful have the installer troubleshoot using KOHLER RS485 COMMUNICATION TROUBLESHOOTING.
      iii. If not successful, please call SPX tech support for assistance.
   b. Is the NOCOMM alarm **not** active and **not** highlighted in **red**?
      i. The system is communicating **successfully,** and you can proceed with any further generator testing needed.

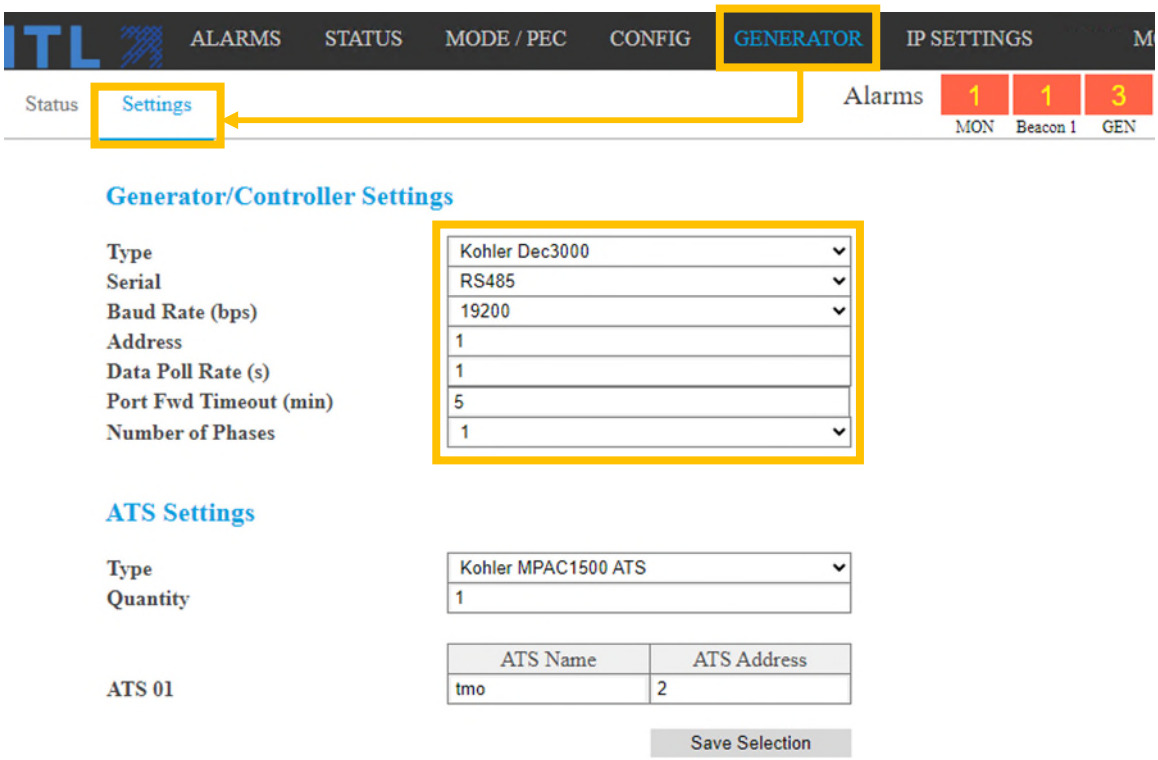


## KOHLER RS485 COMMUNICATION TROUBLESHOOTING

1. Contact the ATC NOC to verify that the MON-2697 is programmed to version ***4.02*** or higher by looking at the Web GUI under ***STATUS=>Monitoring Panel=>Firmware Version***.

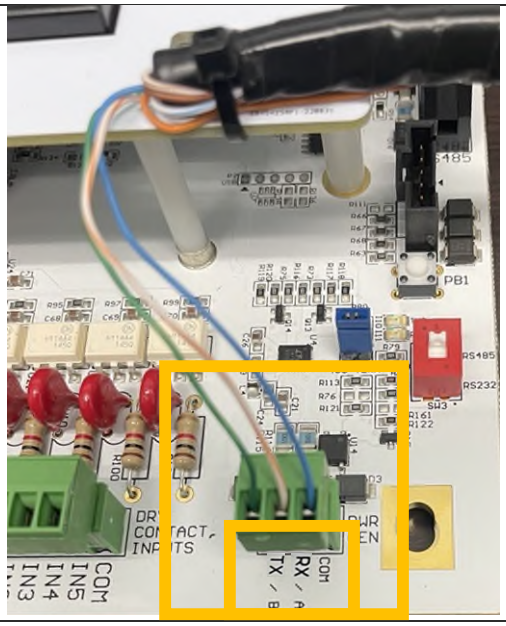


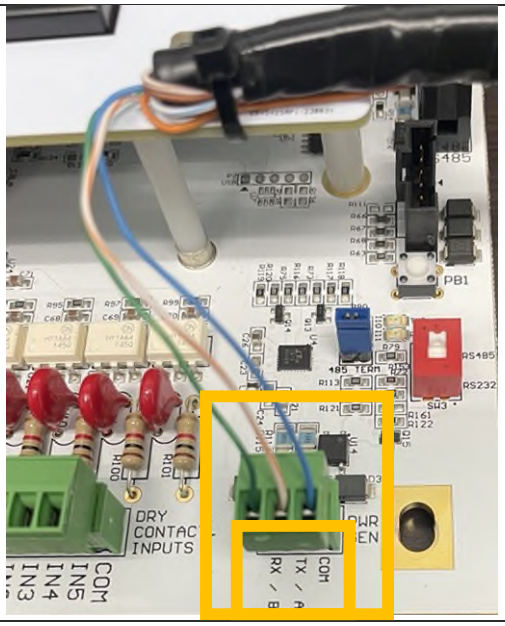

2. Contact the ATC NOC to verify the settings on the Web GUI under ***GENERATOR=>Settings*** are setup according to the picture below. The only exception would be the number of transfer switches which should be setup for the number of transfer switches installed at the site.



3. Verify J5 is wired correctly per the table below.

****To determine the board revision you must use the silkscreen below ****




| Board Rev4 and Below | | | Board Rev5 and Above | | |
|---|---|---|---|---|---|
| **TX / B** | **RX / A** | **COM** | **RX / B** | **TX / A** | **COM** |
| GREEN | WHT/ORG | BLU | GREEN | WHT/ORG | BLU |

4. Remove J5 (PWR GEN) from the MON-2697 board and switch SW3 to RS485.

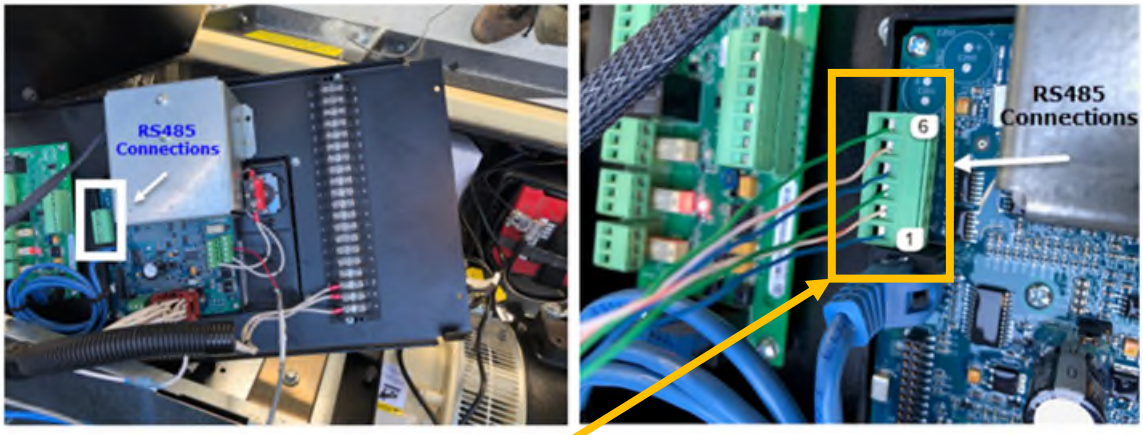
5. Does I10 (TXD) is flash once per second?
   - Yes – Continue
   - No – Replace or Repair the MON-2697

6. Reconnect J5 (PWR GEN) on the MON-2697 board.

7. Remove the four screws from the Kohler generator panel to access the controller board and verify the wiring on P21 (6-Pin Connector) on the controller board corresponds with the diagram and picture below.

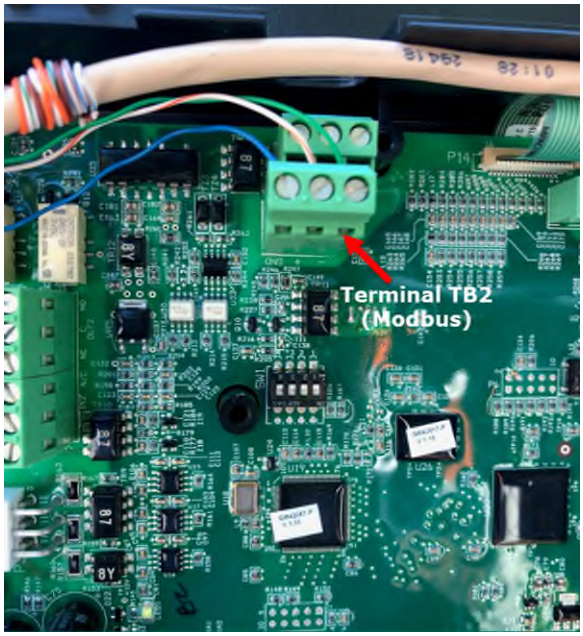
**Four screws hold the controller cover on. The RS485 Connections are behind the controller display.**

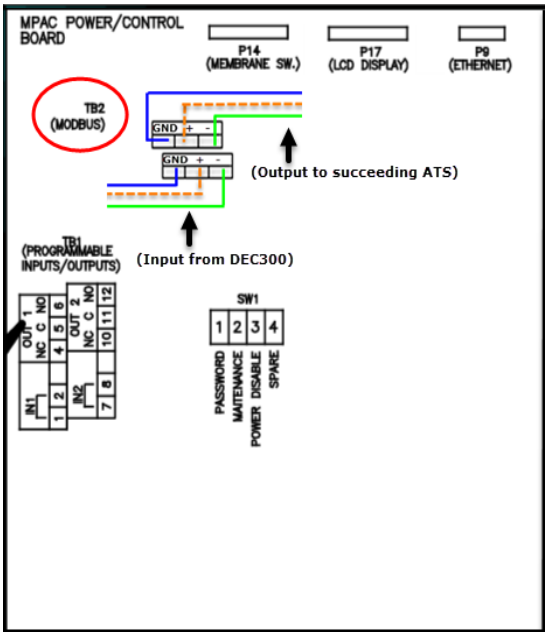

**Unlike Generac, Kohler utilizes MODBUS RS485 connections not only from the KBox to the Generator Controller, but also from the Generator Controller to the ATS(s)**




| P21 6-Pin Connector | | | |
|---|---|---|---|
| RS-485 (RSA II) | | | |
| **Terminal** | **Description** | **Connection** | **Input/Output** |
| P21-1 | GND | Blue | Input from KBox |
| P21-2 | (+) | Orange/White | Input from KBox |
| P21-3 | (-) | Green | Input from KBox |
| P21-4 | GND | Blue | Output to ATS |
| P21-5 | (+) | Orange/White | Output to ATS |
| P21-6 | (-) | Green | Output to ATS |

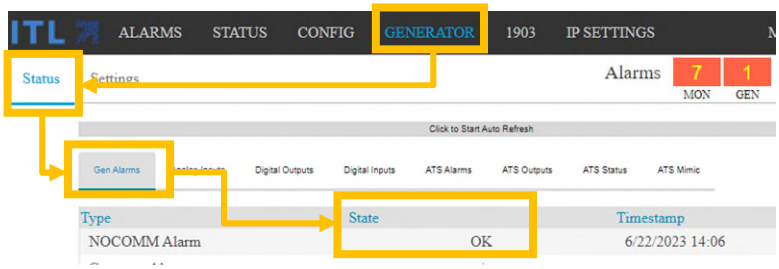
8. Open the Kohler transfer switch to gain access to the control panel board and verify the wiring on TB2 (2x3-Pin Connector) on the controller board corresponds with the diagram and picture below.




9. Are the green I10(TXD) and I11(RXD) on the MON-2697 flashing once per second? (**Pay close attention as these can be hard to see in direct sunlight**)
    - Yes – Continue
    - No
        1. Verify that the CAT5e cable between the MON-2697 and Kohler generator panel is not damaged and is securely connected. **Use a known good cable if this cannot be verified.**
        2. Are the green I10(TXD) and I11(RXD) on the MON-2697 flashing once per second?
            - Yes – Continue
            - No – Replace or Repair the MON-2697

10. Has the NOCOMM Alarm cleared on the Web GUI under ***GENERATOR=>Status=>Gen Alarms***
    - Yes (State is not in Alarm) – Communication is up, and generator is now connected correctly.
    - No – Replace or Repair the Kohler generator panel control board and/or Kohler transfer switch panel control board.

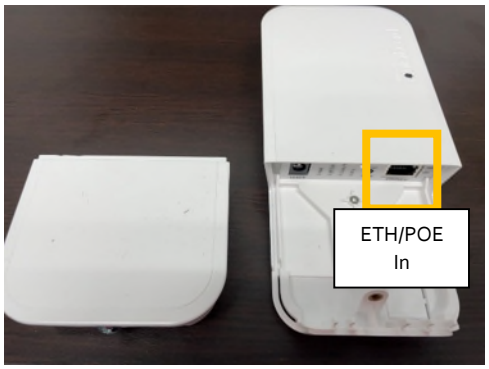


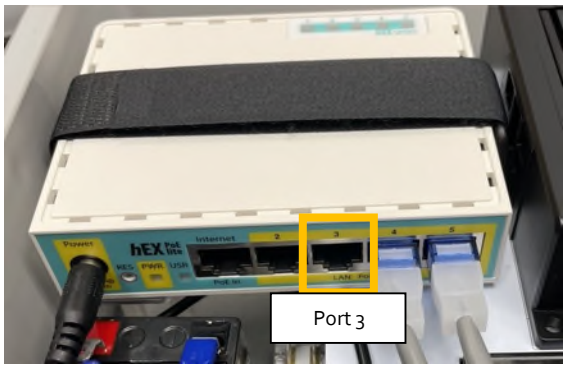
## WAP MOUNTING INSTRUCTIONS

1. This WAP comes with needed hardware to mount onto a wall, ceiling or pole.
2. This item **must** be mounted **upright** like shown in the diagram below. It also **cannot** be mounted to the MON-2697 enclosure. ****Any holes created in the enclosure will void the manufacturer's warranty****

3. The provided template shown below gives details on each of these methods can be completed. On tower sites or generator sites you will most likely use the instructions for Mast/Pole mounting.


4. Take care to make sure your mounting location will fit the length of the included Ethernet cable, otherwise you will have to provide a long enough outdoor rated Ethernet cable to connect the MON-2697-EXT and the WAP.
5. Once the WAP has been mounted connect the Ethernet cable to the WAP ETH/POE In and to the router of the MON-2697-EXT on Port 3.

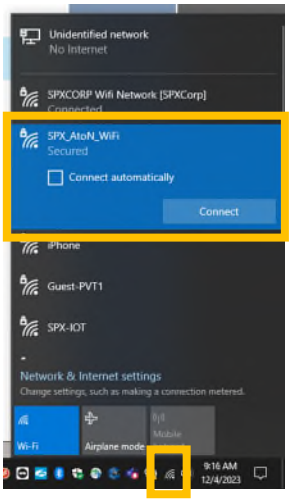



6. Secure the WAP enclosure cap to the WAP unit using the included Tork key.

## CONNECTING YOUR WINDOWS DEVICE TO THE WIFI NETWORK

7. Click on your wifi connection icon in the system tray.
8. Select the 'SPX_AtoN_WiFi' network.
9. Click 'Connect'
10. When it asks for a password enter 'ATCUSAs#1'




## LOGGING INTO THE MONITORING SYSTEM GUI

1. Open a web browser on your computer.
2. Navigate to http://192.168.1.195
3. Enter your 'admin' and 'ATCUSA' as the login and password.
4. This will take you to the alarms tab and verifies that you can access the monitoring system.

**Please contact our Technical Support team if you have any issues.**

**They are available Monday – Friday, 8 am – 6 pm, US Central Time.**

**Call 800-821-5825, 3, 1 (Support/Obstruction)**