



## Microhard IPnDDL – Triad RF Systems BDA Integration Manual

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## Notice

Triad RF Systems reserves the right to make changes to its products or discontinue any of its products or offerings without notice.

Triad warrants the performance of its products to the specifications applicable at the time of sale in accordance with Triad's standard warranty.

## Revision History

| Version | Date    | Changes                          | Author |
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| 1.0     | 6/28/18 | Draft Document - Initial Release | CFD    |
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# 1. Overview

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This document details the integration and setup of a **MicroHard IPnDDL** data link radio with a compatible **Triad RF Systems Bi-Directional Amplifier**. This will include instructions for wiring connections as well as initial and ideal radio settings to maximize data link performance.

The MicroHard IPnDDL radio is used in a variety of military and commercial applications. Some of the applications in which these radios are used may present difficult RF or physical environment conditions.

Certain custom-designed products may have been supplied with a different set of operating manuals or interface control documents. In those cases, the recommendations of the documents supplied supersede the ones contained in this manual.

The instructions provided here will require a copy of the Triad RF Systems BDA specification sheet, which can be obtained from our website at [www.triadrf.com](http://www.triadrf.com). For additional assistance please contact us at [support@triadrf.com](mailto:support@triadrf.com)



**Notes that accompany the warning symbol denote instructions and guidelines that must be followed. Failure to follow these guidelines may result in damage to the amplifier that is not covered by Triad's product warranty.**

## 2. Initial Radio Configuration

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Below is an outline of recommended settings for the MicroHard IPnDDL, to be set **prior** to connecting to the Triad RF Systems BDA.

### 2.1 Radio Output Power

**Please be sure to terminate the RF ports on the radio before powering on the radio.**

It is recommended to initially set the radio output power to its **minimum value**. This will prevent any potential damage to the Triad BDA. The ideal radio power will depend on several factors such as: amplifier gain, data rate required, and amplifier output power. Consult the Triad BDA specification sheet for linear power output.

### 2.2 Frequency

Set the radio operating frequency within the range of the Triad BDA frequency range. Consult specification sheet for frequency details.

### 2.3 Data Link Distance

Set the data link distance to desired or expected operating distance.

 **Before powering on the radio, ensure that the RF ports are properly terminated, or connected to their antennae. Operating the unit with the RF ports open can cause damage to the radio.**

## 3. DC and RF Connections

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A brief outline of electrical and RF connections of the devices under test are listed in the subsections below. Be sure to inspect both wire harnesses and connectors for damage or debris before connecting.

### 3.1 Wiring Harness – MicroHard IPnDDL

**Note:** To ensure compatibility with the MicroHard IPnDDL, the compatible Triad RF Systems BDA has been configured with Automatic Tx/Rx switching. Therefore no electrical connection between the IPnDDL and Triad BDA will be necessary.

 **Please consult the Triad BDA specification sheet for wiring harness pinout.**

### 3.2 RF Connections

Below is a visual representation of the IPnDDL and Triad BDA RF Connections, as well as a table of the required connections between the IPnDDL, Triad BDA, and Antennae.



| MicroHard IPnDDL | Connect to | Triad BDA |
|------------------|------------|-----------|
| ANTENNA          | ➔          | RADIO     |



Visual representation only. Please consult specification sheet for RF connections

| Triad BDA | Connect to | Your Equipment |
|-----------|------------|----------------|
| ANTENNA   | ➔          | Antenna        |

**⚠ Triad RF products are unconditionally stable and can operate into an open circuit up to a certain power output level. Refer to the specification sheet for those limits. However, it is good practice to avoid operating the amplifier into an open circuit for an extended period of time.**

## 4. Troubleshooting

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The table below will outline common setup issues as well as suggested troubleshooting methods.

The instructions provided here will require a copy of the product's specification sheet, which can be obtained from our website at [www.triadrf.com](http://www.triadrf.com)

| Symptom   | Possible Cause   | Solution  |
|---|--|---|
| BDA will not turn on when voltage is applied                      | Connector Wiring   | Ensure proper connections are made to wiring harness.<br><b>Consult wiring diagram on product's spec sheet</b>  |
|   | Supply Voltage Range Exceeded  | Ensure power supply output is set to acceptable voltage range.<br><b>Consult spec sheet for operating voltage range</b>   |
|   | Power Supply Current Insufficient  | Ensure power supply is capable of supplying at least 1.5x the expected current draw of the amplifier. This is due to the inrush current of the unit as it powers on |
| BDA powers down after some time, then turns back on shortly after | Over-Temperature Protection being triggered. Amplifier exceeding recommended operating temperature | Ensure sufficient heatsinking has been applied to unit. Add or increase airflow to heatsink   |
| Intermittent or non-existent data link                            | Improper wiring harness connections  | Refer to section 3.1 and verify that the proper connections have been made between the SC4200 and Triad BDA wiring harnesses  |
|   | Improper RF connections  | Refer to section 3.2 and verify that the proper RF connections have been made between the SC4200 and Triad BDA  |
| Data rate slower than desired.                                    | Excess radio output power - EVM too high   | Reduce radio output power in 0.5 dB steps until data rate improves.   |

For continuing issues, or to request any clarifications or additions to this document, please contact [support@triadrf.com](mailto:support@triadrf.com)