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
1.0	6/28/18	Draft Document - Initial Release	CFD

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1. Overview

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. For additional assistance please contact us at 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

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

A brief outline of electrical and RF connections of the devices under test are listed in the sub-sections 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

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

Symptom	Possible Cause	Solution
BDA will not turn on when voltage is applied	Connector Wiring	Ensure proper connections are made to wiring harness. **Consult wiring diagram on product's spec sheet**
	Supply Voltage Range Exceeded	Ensure power supply output is set to acceptable voltage range. **Consult spec sheet for operating voltage range**
	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