Innovation First, Inc.

RS-422 900 MHz
Robot Controller
User Manual

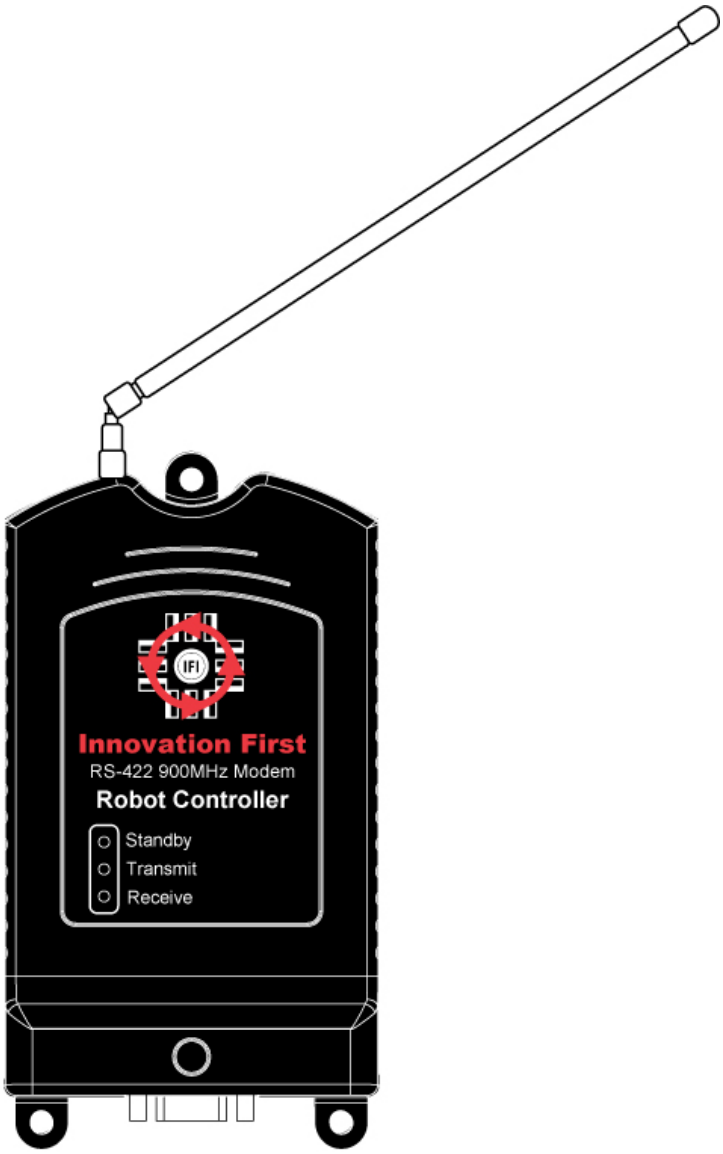

Table of Contents

1. Robot Controller Overview

The Robot Controller radio is part of the Innovation First Robotics Control System. The Robot Controller radio receives commands and data from the Robot Controller board (RC). It communicates via radio frequency with the Operator Interface Controller (OI) via the Operator Interface radio.

Reference Documents (available at www.InnovationFirst.com)
Size, weight, and mounting info
Frequently Asked Questions (FAQs)
FRC Control System Overview
FRC Control System Quick Start

2. Installation

The Robot Controller may be attached to the robot in any orientation. For best communication with the Operator Interface, it is suggested the radio and antenna be mounted in a vertical orientation away from metal. Size and mounting information is available at www.InnovationFirst.com.

3. Theory of Operation

The Robot Controller radio connects to the Robot Controller (RC) via a shielded DB9 cable. The RC supplies power, ground and control information to command the Robot Controller radio to transmit to and receive from the Operator Interface radio. Radio communications is over the 902 – 928 MHz ISM band.

The RC to Robot Controller radio communication is controlled by imbedded software in the RC and radio. No user software is required. To establish an OI to RC connection, refer to FRC Control System Overview and Quick Start documentation available at www.InnovationFirst.com.

4. FCC / Industry Canada Certification and Warnings

This equipment has been tested and found to comply with the limits for radio controlled devices, pursuant to applicable portions of FCC Part 15 and Industry Canada RSS-210 for license-exempt (i.e. unlicensed) low-power radiocommunication devices. These limits are designed to provide reasonable protection against harmful interference.

Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device."

Warning: Changes or modifications not expressly approved by the party responsible for compliance may cause interference and void the user's authority to operate the equipment. There are no user serviceable parts inside.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

5. Robot Controller Indicators

The Robot Controller has the following indicators, as labeled on the cover.

Table 5.1: Robot Controller Modem LED States

Indicator	State	Description
All	Solid Off	No power to radio, cable not connected, RC turned off.
Standby	Solid Off	Check the Transmit and Receive LEDs.
Standby	Solid On	Not a valid state.
Standby	Blink	Modem being configured by the RC or the receiver is searching for valid Operator Interface packets.
Transmit	Solid Off	Modem not transmitting. It will not transmit until valid receive packets have come in. Check the Standby and Receive LEDs.
Transmit	Solid On	Not a valid state.

Transmit	Blink	Transmitting packets.
Receive	Solid Off	Not receiving valid packets.
Receive	Solid On	Not a valid state.
Receive	Blink	Receiving valid packets. Valid packets are not qualified to team number by the Modem. The RC determines if the packet received came from the correct team's OI.

Appendix A: Document Version History

Date Code	Changes
2006-10-31	Initial document release.
2006-12-19	Added FCC warning.