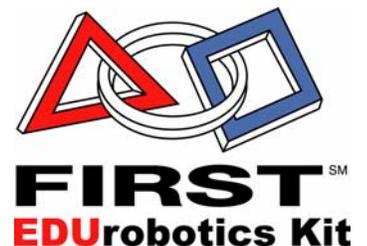
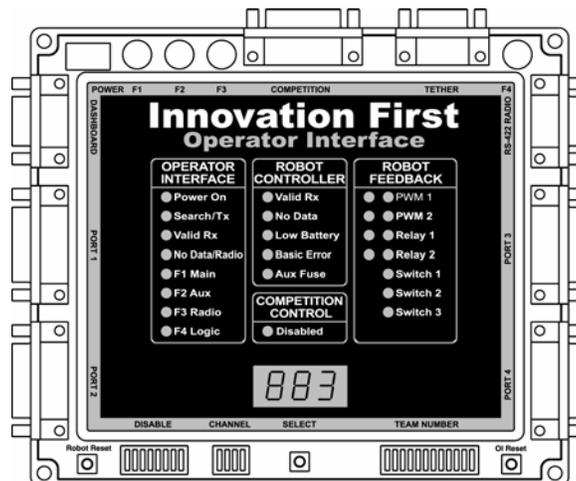
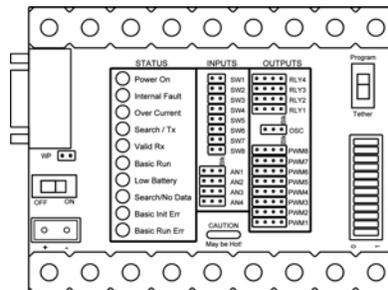


# Innovation First, Inc.

## EDU Control System Quick Start Guide



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## 1. System Overview

The heart of the Innovation First EDU Control System is an Operator Interface and an Isaac16 EDU Robot Controller with Motherboard. The Operator Interface takes inputs from the human operator(s) and passes it to the Robot Controller. The Robot Controller takes this information, gathers additional information from sensors on-board the robot, determines how the robot should function, and controls the robot to perform the functions. The Robot Controller also sends data back to the Operator Interface, giving the human operator(s) feedback of critical information.

The Operator Interface used with the Isaac16 EDU Robot Controller is the same as the Operator Interface used with the Full-Size Robot Controller.

The Innovation First control system uses a unique “Team Number” identification to ensure safe and reliable human to robot communication. Users enter their team number via dipswitches on both the Operator Interface and the EDU Robot Controller. Both units use this number as a unique identifier, ensuring that all communications received are actually “theirs”. Section 4 describes how to set the Team Number.

**2. Wireless System Setup Guide**

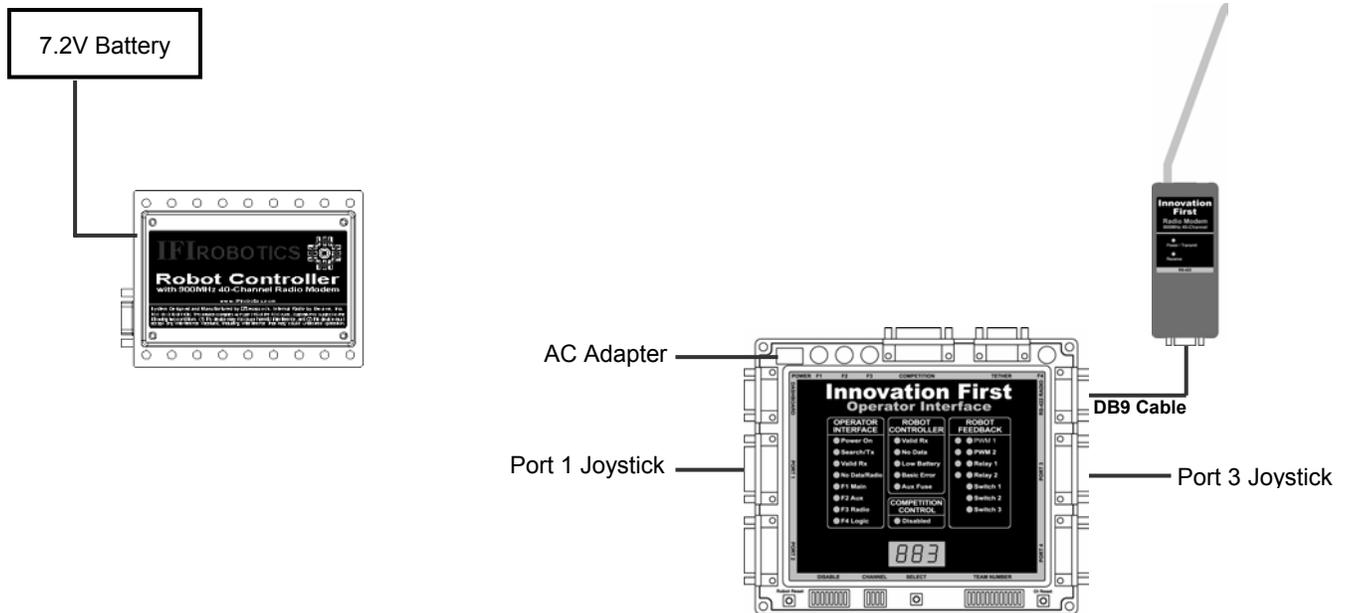
This guide shows a diagram of the basic cabling required to begin using the control system in a wireless configuration. Also, this guide consists of a list of components required for the Quick Setup based on using the default program.

**Robot Control System pieces:**

- (1) Isaac16 EDU RC with Motherboard
- (1) 7.2V Battery

**Operator Control System pieces:**

- (1) Operator Interface
- (1) AC Adapter
- (1) RS-422 Radio (OI)
- (1) DB9 M-F Cable
- (2) Joysticks



**3. Tethered System Setup Guide**

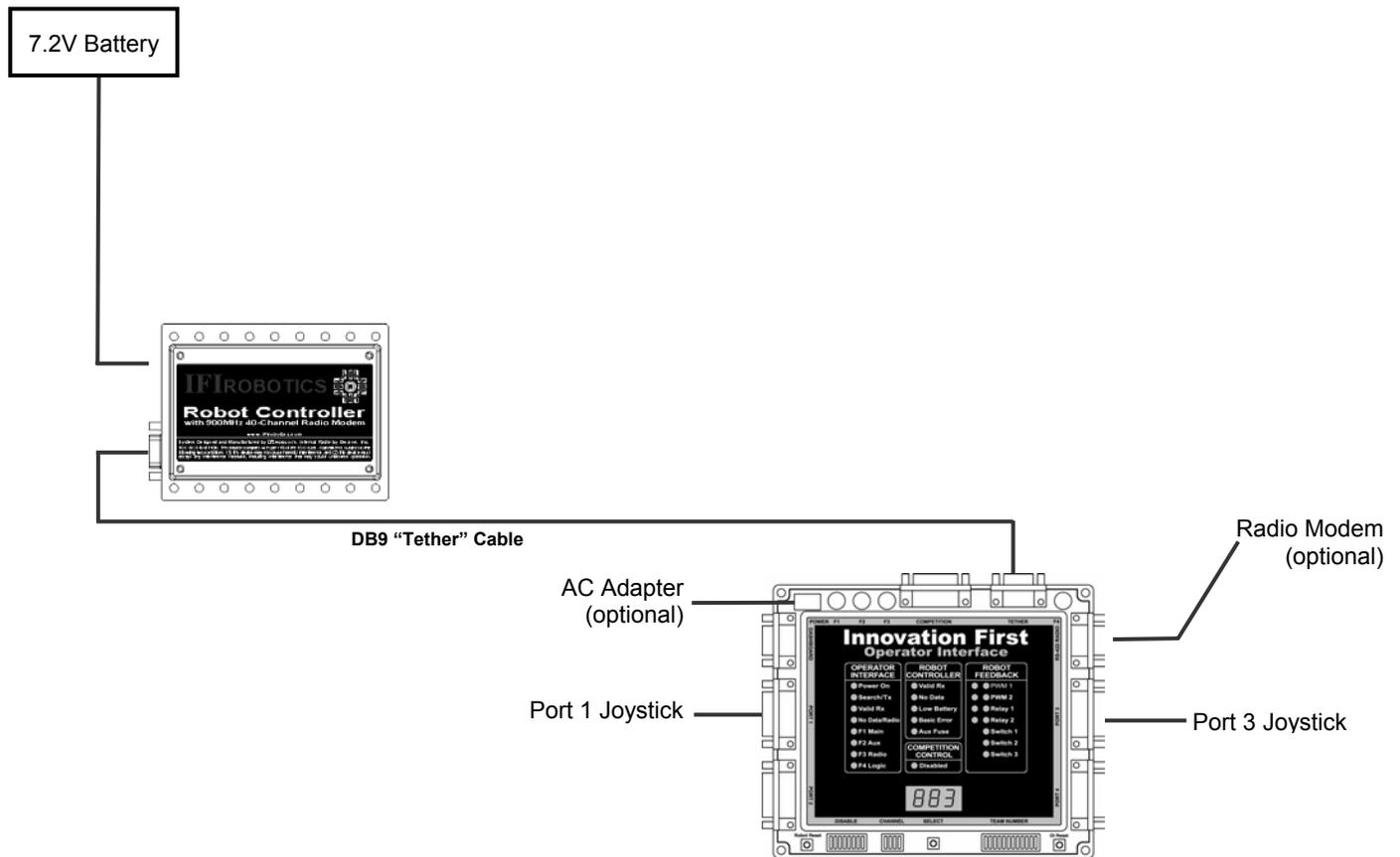
This guide shows a diagram of the basic cabling required to begin using the control system in a tethered configuration. Also, this guide consists of a list of components required for the Quick Setup based on using the default program.

**Robot Control System pieces:**

- (1) Isaac16 EDU RC with Motherboard
- (1) 7.2V Battery

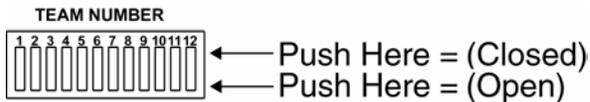
**Operator Control System pieces:**

- (1) Operator Interface
- (1) DB9 M-F Cable
- (2) Joysticks



#### 4. Setting Your Team Number

1. Without “Power” applied, connect the system together for a wireless configuration.
2. Power up the Operator Interface. Connect the AC Adaptor to 115V 60Hz power. Plug the AC Adaptor cable into the POWER connector on the Operator Interface (turning it ON).
3. Set Team Number:



- a. Set each of the twelve TEAM NUMBER switches to the Switch Closed position. The Operator Interface display should show “000” on a 3-digit display, and “0000” on a 4-digit display.

**CAUTION: You can not use a team number of zero. A team number of zero is reserved for Autonomous Mode. If the Robot Controller is set to a team number of zero, it will begin executing PBASIC code and could start moving if you have modified the default code.**

- b. Set switch 3 Open on a 3-digit display and switch 1 Open on a 4-digit display and look at the display.
  - If the number displayed is greater than your team number, return the switch to Closed.
  - If the number displayed is less than your team number, leave the switch Open.
  - If the number displayed is your team number, go to step 4.
- c. Repeat step b. using the next switch (4, 5, 6 . . .)
4. Copy the “Team Number” switch settings from the Operator Interface to the Isaac16 EDU Robot Controller / Motherboard.
5. Power ON the Isaac16 EDU Robot Controller.
6. After a few seconds, the “Search/TX” and “Valid RX” lights should be flashing on both units, indicating each is transmitting and receiving valid data with the correct team number.
7. The display on the Operator Interface will change to the channel number (c # #).

## 5. Testing the System

### System Feature Overview

The system should be working correctly now. Try the following to see how it works. Be sure there are no jumpers on the EDU Motherboard on the Digital Inputs SW5 through SW8. Connect a Multi-Speed Motor to PWM1 and RLY1 on the EDU Motherboard.

1. You should center the Y axis on Port 1 using the trim tab on the Port 1 Joystick. With the joystick centered, move the trim tab until both “PWM1 Red” and “PWM1 Green” LEDs on the Operator interface are both ON. Both LEDs “ON” at once indicate that the joystick is centered. Repeat this process for the “Y” axis on Port 3 using the PWM2 lights.
2. Pressing the ROBOT RESET button on the Operator Interface should cause the “Basic Init Err” light on the Robot Controller to flash, indicating the PBASIC processor is resetting.
3. Moving the PORT 1 joystick forward and back should move the Multi-Speed Motor connected to PWM1 output on the EDU Motherboard.
4. When the PORT 1 “Y” axis joystick is all the way forward, the “PWM1 Green” LED on the Operator interface should be ON, indicating full forward.
5. When the PORT 1 “Y” axis joystick is all the way back, the “PWM1 Red” LED on the Operator interface should be ON, indicating full reverse.
6. Pressing the trigger or thumb buttons on the Port 1 joystick should move the Multi-Speed Motor connected to RLY1. Notice that the motor moves at full forward or reverse speed only.
7. When pressing trigger or thumb buttons on the Port 1 joystick, the RELAY 1 and RELAY 2 Green or Red LEDs on the Operator Interface will be ON, respectively.
8. Pressing the SELECT button on the Operator Interface will change the display between Robot Battery Voltage, User Mode, Team Number, and Channel Number. Leave the User Mode selected. User mode is identified by a small “u” on a 4-digit Operator Interface display or by two decimal places on a 3-digit Operator Interface display.  
Note: All feedback LEDs on the Operator Interface are disabled while in User Mode.
9. Move the PORT 1 “Y” joystick forward and back. The digit display on the OI will display the corresponding Port 1 “Y” axis software value that is sent from the Robot Controller.