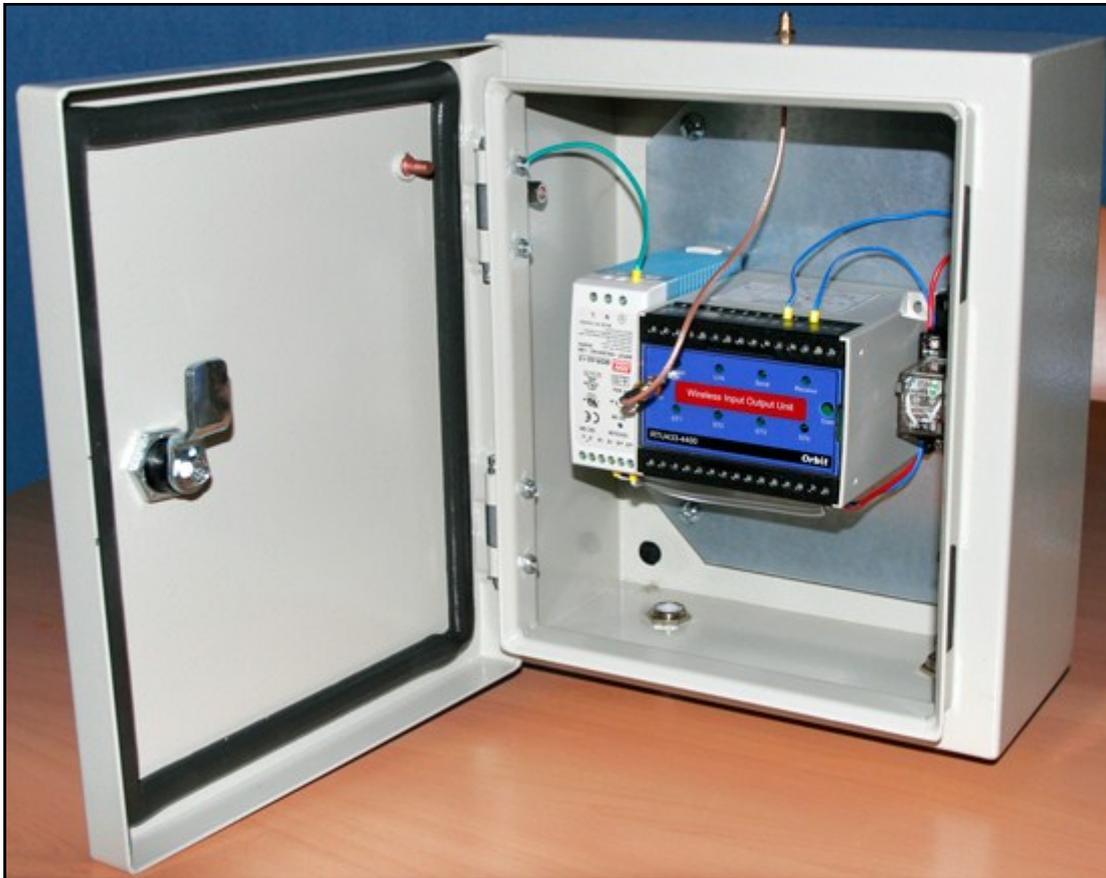


# RTU™

## Wireless Input/Output system



## User Guide

Revision 1.2

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# Introduction

The RTU wireless input/output system is designed to offer a reliable wireless switching system between remotely located equipment. The system is easy to set up and use and requires no tuning or ongoing maintenance.

The system consists of an Originating unit and Responding unit.

The state of each of the digital inputs at each end of the link will be indicated at the corresponding output at the other end of the link.

The system forms a virtual connection between a Digital input at one end of the link and the corresponding relay output at the other end. It also forms a virtual link in the other direction from Digital inputs at the Responding Unit back to the corresponding relay outputs at the Originating end of the link.

The system constantly monitors over-air communications and in event of loss of communications, both ends will indicate a FAULT and switch all Digital Outputs to the OFF state.

Optional Solar Power Supply

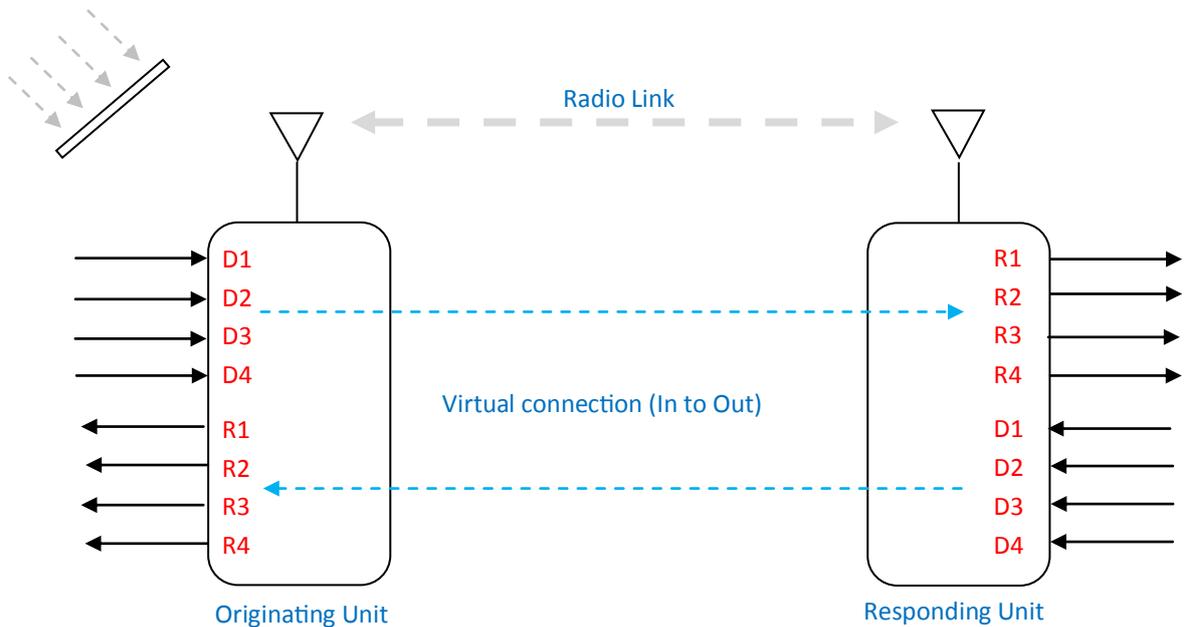


Figure 1. System Overview Diagram

## How it Works

The “Originating” Unit continuously monitors the state of its Digital Inputs (“D1” to “D4”).

The Originating unit will send a message to the “Responding” unit containing the value of each of the Digital inputs approximately twice per second.

When the Responding unit receives a valid message from the Originating unit it will set the state of its Relay outputs (“R1” to “R4”) accordingly. If D1 is HIGH/OPEN at the Originating end then the Corresponding Relay output at the responder will be OPEN/FLOATING. If the Digital input is LOW/CLOSED then the corresponding Relay output will be LOW.

Once the Responder unit sets the Relay output states in accordance with the values received from the Originating unit, it will read the state of its Digital inputs (“D1” to “D4”) and then send a message containing the value of the Digital inputs back to the Originating Unit.

When the Originating unit receives a valid reply from the Responding unit, it will set its Relay outputs in accordance with the state of the Digital inputs at the Responding unit.

Both the Originator and Responder will show the State of the Inputs at the OPPOSITE end of the link Relay output states.

Typically the digital inputs are connected to voltage-free source such as a relay contact, float switch, push button switch, PLC output etc.

The Relay outputs each provide a Common, Normally-Open and Normally-Closed contact rated up to 230VAC/2 Amps. External relays can be connected for higher power switching applications.

If the Responding unit does not reply to the Originator message, the Originator will immediately try several times and if still no response is received, the Originator will indicate a radio error by switching off the LINK OK LED and also will switch all Relay outputs OFF.

If the Responder unit does not receive a valid message from the Originating unit within approximately 30 seconds, it will indicate the radio error condition and switch of all Relay outputs OFF.

## LED Status Panel

The front panel has a number of LEDs that indicate particular conditions for the system.

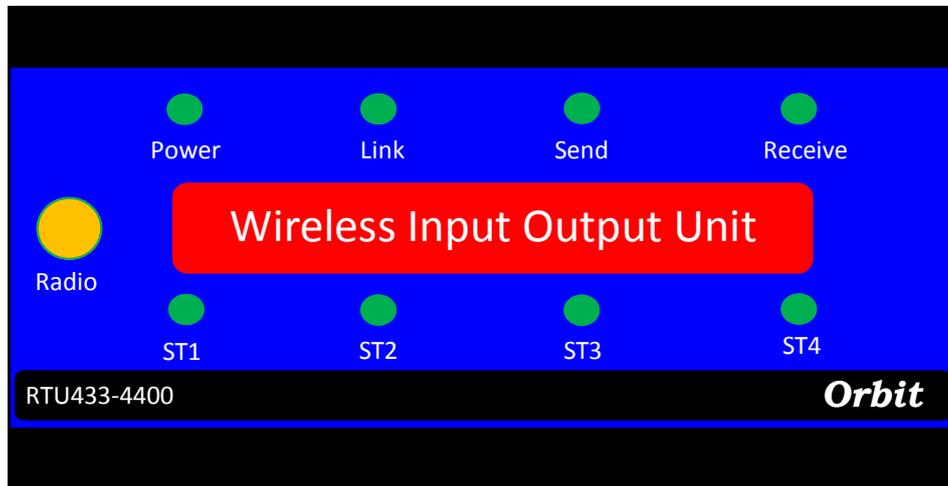


Figure 2. LED Status Panel

LED	Description	Function
Power	Power Indicator	ON when unit has power
Link	Link Health	ON when radio link is healthy
Send	Send Status	Blinks when sending a radio message
Receive	Receive Status	Blinks when receiving a radio message
ST1	R1 Status	ON when R1 is activated
ST2	R2 Status	ON when R2 is activated
ST3	R3 Status	ON when R3 is activated
ST4	R4 Status	ON when R4 is activated

Table 1. Functions of LED Status Panel

## Originator and Responder Unit Wiring

The Originator unit must be powered by 12 or 24V DC (Current requirement < 100mA peak).

Orbit also supplies the following power supply options:

- Solar Power kit
- 230VAC DIN rail supply (95 to 275 VAC input)
- Wall plug pack (12V or 24V DC)
- Battery backup system with trickle charger

Digital Input signals are wired between any of the “D1” to “D4” input terminals and the (-) terminals. All “GND” terminals are connected together with the main power supply “GND”.

Relay outputs are voltage-free contacts that provide common, normally-open and normally closed functions. (rated up to 230VAC/ 2 Amps maximum load).

## Antenna

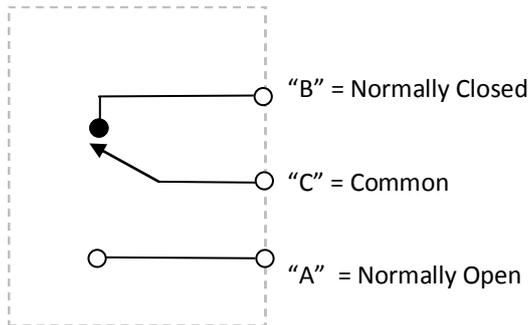
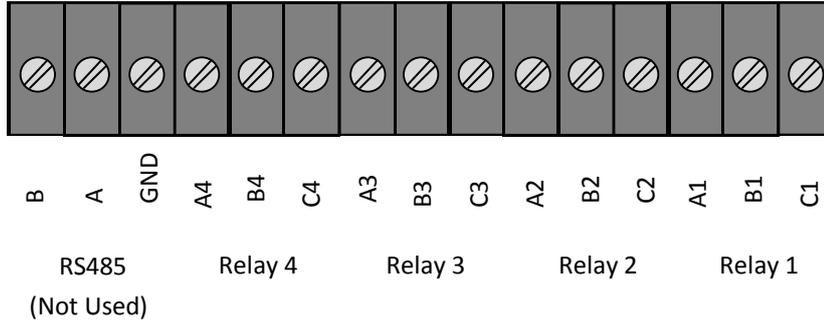
The Antenna kit comprises a small whip antenna with a base, right-angle metal mounting bracket and 5m of cable (which is terminated with a small “SMA” style connector to plug directly into the “Radio” connector on front panel of RTU433-4400).

The antenna should be mounted vertically, high as possible and in good view of the antenna at the other end of the link. Ensure the whip part of the antenna is not located close to metal objects.

Higher gain antenna options are available from Orbit:

- Collinear whip. High gain suitable for omni-directional (any direction)
- Yagi. High gain directional antenna similar in style to typical television antenna.

**Top row of Terminals**

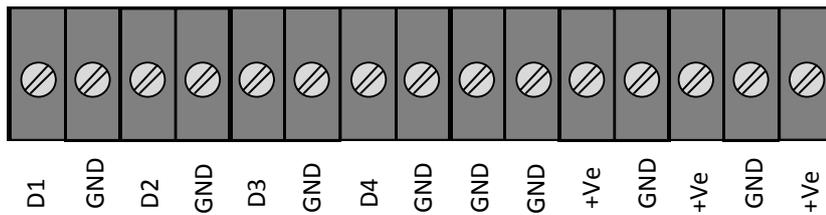


**Maximum Voltage = 230 VAC**

**Maximum Current = 2A**

Details of Relay contacts

**Bottom row of Terminals**

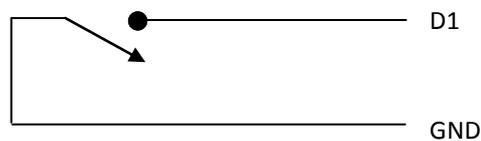


D1 to D4 = Digital input

GND = Power supply negative, ground

+Ve = Power supply positive 12 or 24V DC

Switch, Relay or PLC output



**Typical Digital Input wiring**

## Digital Inputs

The Digital Inputs are pulled up to +5V DC via an internal pull-up resistor. The inputs can tolerate over voltage and reverse polarity voltage to +/- 30V DC. ***Voltages applied outside of this range may cause damage.***

The Digital inputs can be operated using any voltage free contact (such as a Relay contact, open drain or open collector output from another device or a switch), the input can also be connected to a voltage source (recommend 0V to 10V maximum). Note: The Common side of the input devices must connect to the GROUND terminal of the RTU device.

## Relay Outputs

The RTU Relay outputs are rated at maximum load of 230VAC and 2 Amps.

Additional voltage or current capacity can be obtained by addition of external relays. Orbit can provide external relays and latching relays.

## Safety Precautions

The following safety precautions must be observed whenever the Orbit wireless device system is in operation or in service. Failure to comply with these precautions violates the safety standards of the design, manufacture and intended use of the product

- The system is not to be used:

In hospitals or places where medical equipment may be in use.

In an aircraft (whether on the ground or in the air)

Refuelling points

Explosive areas

- Restricted use of the Orbit wireless device

Near any chemical plant

Near any Fuel depot

The Orbit wireless device system receives and transmits radio frequency energy while switched on, therefore interference can occur if the Orbit wireless device is located near TVs, radios, PCs or any inadequately shielded equipment.

### **WEEE directive 2002/96/EC, disposal of old electronic equipment**

This product shall not be treated as household waste. It must be placed at an appropriate collection point for the recycling of electrical and electronic equipment. By ensuring the correct disposal of this equipment, it will help the environment and human's health. The recycling will help to conserve the natural resources.

### **Important**

Due to the nature of wireless systems, transmission and reception of data can never be guaranteed. Data may be corrupted (i.e. Have errors) or be totally lost at certain times due to the environment, other machinery or malfunction of electronic components. Although significant loss of data are rare when wireless devices such as the Orbit wireless device system are used in a normal manner, Orbit's wireless device system should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death or loss of property. Orbit Communications Pty Ltd accepts no responsibility for damages of any kind resulting from errors in data transmitted or received using Orbit's Orbit wireless device systems, or for the failure of the Orbit wireless device system to transmit or receive such data.

Do not operate the Orbit wireless device system in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference, in such areas, Orbit's wireless device system must be powered OFF.

Do not operate Orbit wireless device system in any aircraft, whether the aircraft is on the ground or in flight. In an aircraft the Orbit wireless device system must be powered OFF.

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## Warranty

All products manufactured by Orbit Communications Pty Ltd are warranted to be free from defects in materials and workmanship under normal use and service for 36 months from the date of shipment unless otherwise specified. Orbit Communications' obligation under this warranty is limited to repairing or replacing (at Orbit's discretion) defective products. The customer shall assume all costs of removing, reinstalling and shipping defective products to Orbit Communications. Orbit Communications will return such products by surface carrier prepaid. This warranty shall not apply to any Orbit product that has been subject to modification, misuse, neglect, accidents of nature or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. Orbit Communications is not liable for special, indirect, accidental, or consequential damages.

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