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Patents Pending
RoHS CE • ESTI
RFD21733 • FCC • IC
RFD21743 • FCC
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RF DIGITAL

C O R P O R A T I O N

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Fast Answers: support@rfdigital.com

RFDP8	RFDP8
RF Module	RFDANT
RFD21733	RFD21742
RFD21735	RFD21743
RFD21737	RFD21772
RFD21738	RFD21773
RFD21739	KEYFOBS

Compliance Approved 2.4 GHz RF Transceiver Modules with Built-In RFDP8 Application Protocol

Complete **Compliance Approved & Certified**, **READY-TO-USE**, 2.4 GHz wireless solution with built-in RFDP8 interference-tolerant user application protocol. Includes RFID, 32 Bit ESN, Logic Switch Transmitter / Receiver, 9600-8N1 Serial UART Transceiver and many easy-to-use addressable network modes. No development required at all, no RF layout, no code writing, all features are built-in. Be up and running with a wireless solution in minutes.

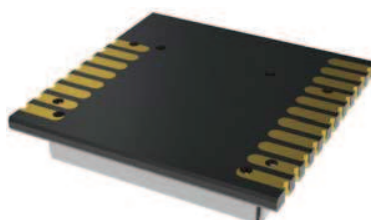
RFD21733 IC & FCC APPROVED

CE • ESTI TESTED & COMPLIANT



500 Foot Range

Easy to solder 0.050 Inch SMT pads



15mm x 15mm
(0.600 x 0.600 Inch)

RFD21735

Optional Configuration



CE • ESTI
For use with any
External Antenna

KEYFOBS & RFID

IC • FCC APPROVED

CE • ETSI Compliant

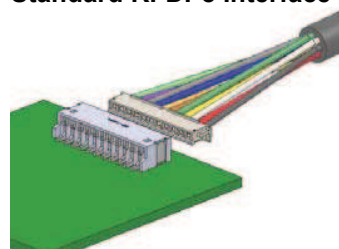
Standard & Custom



RFDANT • RFD21743 FCC APPROVED



Simple Drill Hole Mount

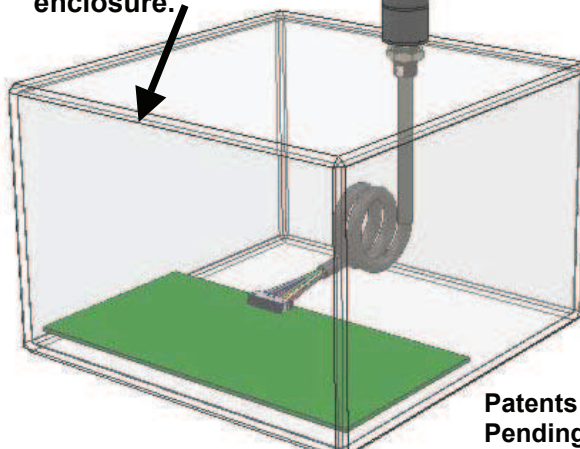


No Need for RF cables.
Only +3V • GND • Data.
1.5mm 11pin Connector.
Fits onto any PCB.
SMT or Through Hole.

CE • ESTI TESTED & COMPLIANT



Use any plastic or metal enclosure.



Complete
RADIO
INSIDE
Antenna

Patents
Pending

2,000 FOOT ULTRA LONG RANGE

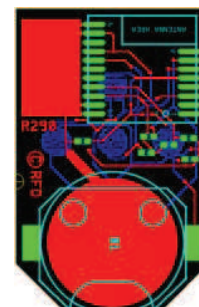
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KEYFOBs

The RFD21733 Module with its RFID interval factory set to 30 seconds is inside of a KEYFOB enclosure with a CR2032 battery. The reference layout for this device is available through support@rfdigital.com if you want to build it yourself. However if you wish to purchase the ready-made KEYFOBs from RF Digital they are available, part numbers shown below.

There are two modes of use, one is in Active RFID mode where the KEYFOB automatically transmits its ESN once every 30 seconds. The other mode of use is SWITCH transmitter, which is available in 1, 2 or 3 buttons. The RFID versions also have 1, 2 or 3 buttons so they serve as an automatic RFID transmitter and in addition have the switch buttons in one KEYFOB.

If you do not need the automatic Active RFID feature, just use the Switch Button KEYFOBs.



	 Rotatable Buttons	RFD21783	RFD21793
		3 Button Switch Keyfob	3 Button RFID Keyfob
Pressing button 1, 2 or 3 will cause the output 1, 2 or 3 on the RFD21733 Module or RFD21743 / RFD21732 RFDANT to go high for the duration the button is pressed, when in one of the 4 switch modes. If in Serial UART mode, then you will receive 1 byte representing which button is pressed or if RFID transmission and 4 more bytes indicating the 32 bit unique ESN of the KEYFOB.			

	 Rotatable Buttons	RFD21782	RFD21792
		2 Button Switch Keyfob	2 Button RFID Keyfob
Pressing button 1 or 3 will cause the output 1 or 3 on the RFD21733 Module or RFD21743 / RFD21732 RFDANT to go high for the duration the button is pressed, when in one of the 4 switch modes. If in Serial UART mode, then you will receive 1 byte representing which button is pressed or if RFID transmission and 4 more bytes indicating the 32 bit unique ESN of the KEYFOB.			

	 Rotatable Buttons	RFD21781	RFD21791
		1 Button Switch Keyfob	1 Button RFID Keyfob
Pressing button 2 will cause the output 2 on the RFD21733 Module or RFD21743 / RFD21732 RFDANT to go high for the duration the button is pressed, when in one of the 4 switch modes. If in Serial UART mode, then you will receive 1 byte representing which button is pressed or if RFID transmission and 4 more bytes indicating the 32 bit unique ESN of the KEYFOB.			

TYPICAL RANGE

Range results need to be tested for every application and scenario. RF Digital's range tests are done line-of-sight and outdoors in a typical city street setting. You should use these typical range test results as a point of reference, until you can conduct your own range tests in your own test environment. If you have any questions, always feel free to contact RF Digital Support at support@rfdigital.com

LONG RANGE

MODULE	500 FOOT RANGE	MODULE
	↔	
RFD21733	150 Meters	RFD21733

LONGER RANGE

MODULE	1,000 FOOT RANGE	RFDANT
	↔	
RFD21733	300 Meters	RFD21743
		RFD21742

ULTRA LONG RANGE

RFDANT	2,000 FOOT RANGE	RFDANT
	↔	
RFD21743	600 Meters	RFD21743
RFD21742		RFD21742

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RFD21737	RFD21772
RFD21738	RFD21773
RFD21739	KEYFOBs

TYPICAL APPLICATIONS

- | | | | |
|--|---|--|--|
| <ul style="list-style-type: none"> • Active RFID • Long Range RFID • Remote Control • Light Controls • Home Automation • Alarm Security • Keyless Entry • Perimeter Monitoring | <ul style="list-style-type: none"> • PC Keyboard Security • Wireless Keyboard • Wireless Mouse • TV Remote • Home Stereo Remote • Asset Tracking • Wireless PTT • Remote Switches | <ul style="list-style-type: none"> • Remote Terminals • Wireless RS232 DB9 • Wireless RS485 • Temperature Control • HV/AC • Meter Reading • Data Acquisition • Inventory Control | <ul style="list-style-type: none"> • Keyfob Remotes • Industrial Controls • Vending Machines • Pan-Tilt-Zoom Control • Camera Flash Control • Biometrics • Seismic Monitoring • M2M & many more... |
|--|---|--|--|

LONG RANGE

KEYFOB / RFID	350 FOOT RANGE	MODULE
	 100 Meters	
RFD21783		RFD21733
RFD21782		
RFD21781		
RFD21793		
RFD21792		
RFD21791		

LONGER RANGE

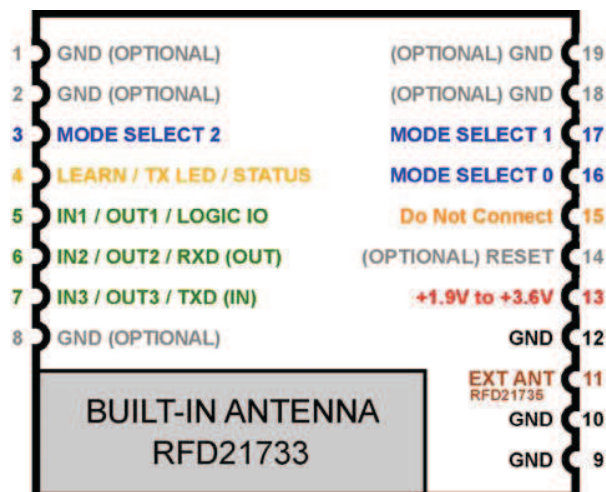
KEYFOB / RFID	700 FOOT RANGE	RFDANT
	 200 Meters	
RFD21783		RFD21743
RFD21782		RFD21742
RFD21781		
RFD21793		
RFD21792		
RFD21791		

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PINOUTs

There are 11 total active signal pins including power and ground for both MODULEs and RFDANTs. The MODULEs have 7 additional ground pins. Also the MODULEs have one extra pin for a total of 19 pins, this is pin 11, which applies only to the RFD21735 which is for external antenna, however the RFD21733 pin 11 is a no-connect since it has a built-in antenna.

RFD21733 • RFD21735 MODULEs



RFD21733

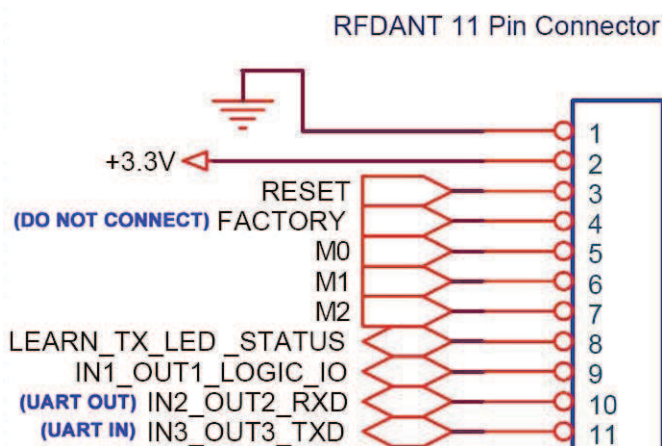


RFD21735



There are a total of 8 ground pins, you only need just one ground pin for an electrical connection to make the module function. The additional ground pins are for convenience and also performance with layout configurations. The pin 12, 10 and 9 are recommended to always be connected since they help provide some ground area for the module as well as on the opposing side of the antenna. However just one single ground out any of the 8 GND pins are adequate for proper function.

RFD21742 • RFD21743 RFDANTs



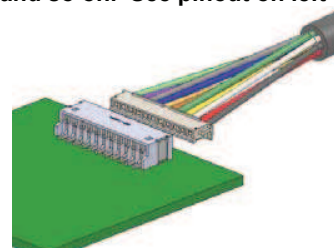
RFD21742



RFD21743



The black wire (ground) is pin #1, the red wire (+V) is pin #2, and so on. See pinout on left side.



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RFD21738 RFD21773
RFD21739 KEYFOBs

FEATURES

- Runs on a single coin cell for years.
- WiFi interference tolerant.
- Heavy 2.4 GHz noise and interference tolerant.
- Motor noise and interference tolerant.
- Very low cost.
- No external parts required.
- No RF layout required.
- Easy and ready-to-use, hand-held, eval and application boards available.
- Ultra small 15mm x 15mm footprint (RFD21733/RFD21735)
- Fully contained, truly finished, ready to use module.
- CE / ETSI / IC & FCC Certified and Approved.
- Typical range: 500 feet (150 meters): RFD21733 MODULE.
- Typical range: 2,000 feet (600 meters): RFD21742 and RFD21743 RFDANTs.
- Worldwide 2.4GHz ISM band operation.
- User configurable without need for any programming.
- 2uA Ultra low power modes.
- Only 14mA current consumption at 0dbm TX and 17mA at RX.
- 16 bit CRC data accuracy verification built-in.
- 32 bit unique factory ESN in every module (4 billion combination security).
- Flexible network modes, including broadcast and individual addressing.
- Optional version available for use with external antenna (RFD21735).
- Switch on/off, logic, remote-control without the need for an external controller.
- Switch nodes individually addressable without the need for an external controller.
- Wide supply range +1.9V to +3.6V.
- Built-in, high performance internal miniature antenna (RFD21733).
- Peer to Peer (Ad-Hoc) networks and configurations.
- Point to Multi-Point networks and configurations.
- Multi-Point to Multi-Point networks and configurations.
- Selective addressing of any module by using factory built-in ESN.
- Fast-turn-around, minimal latency (20 millisecond).
- Patent pending RFDP8 interference tolerant protocol.
- Full application protocol runs transparent to the user.
- Easy to use, simple to design in.
- Stores up to 60 ESNs (Electronic Serial Numbers) for network modes.
- Many to one data modes ideal for multi-point data acquisition.
- Unlimited number of module nodes can communicate to each other.

CUSTOM Modules

RF Digital's RFDP8 application firmware loaded into the MODULEs or RFDANTs can be customized to fit application specific requirements.

RF Digital can design and manufacture fully custom modules to fit your needs.

If you do not find what you're looking for, feel free to contact RF Digital with your requirements. Email: support@rfdigital.com

FAST Support

For free RF layout design reviews, send color screen captures of your layout to support@rfdigital.com, you will save time and money before you fab your boards.

Our FAST RESPONSE Support Team welcomes your questions!

RFDP8 Application Protocol • Mode Selector Chart

RFDP8 Standard Mode Chart

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Mode	Description	Mode Select Inputs						Learn / Status	
		2	1	0					
0	Active RFID Transmitter	0	0	0	IN 3	IN 2	IN 1	TX LED	
1	3 Input Switch Logic Transmitter	0	0	1	IN 3	IN 2	IN 1	TX LED	
2	Serial UART Transceiver, 9600, N, 8, 1	0	1	0	TXD IN	RXD OUT	LOGIC I/O	X	
3	Serial UART Transceiver, 9600, N, 8, 1	0	1	1	TXD IN	RXD OUT	LOGIC I/O	ESN LEARN	Network
4	3 Output Switch Logic Receiver - 500ms	1	0	0	OUT 3	OUT 2	OUT 1	X	
5	3 Output Switch Logic Receiver - 500ms	1	0	1	OUT 3	OUT 2	OUT 1	ESN LEARN	Network
6	3 Output Switch Logic Receiver - 20ms	1	1	0	OUT 3	OUT 2	OUT 1	X	
7	3 Output Switch Logic Receiver - 20ms	1	1	1	OUT 3	OUT 2	OUT 1	ESN LEARN	Network
Module RFD21733 / RFD21735 Pin Number:		3	17	16	7	6	5	4	
RFDANT RFD21742 / RFD21743 Pin Number:		7	6	5	11	10	9	8	

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Choosing between RFD21733 Module or RFD21743 RFDANT

The RFD21733 RF Module and the RFD21742 / RFD21743 RFDANTs have the same electrical interface and are both embedded with the Patent Pending R FDP8 interference immunity protocol. They are pin for pin electrically compatible. Except for the different form factor, cost and range, they are basically the same. The RFDANTs have an 8 inch long 1.5mm, 11pin connector termination for its interface to your electronics, were the RFD21733 module has a 19 pin SMT interface and solders to your PCB. Only 11 out of the 19 pins are used for electrical interface.

The RFD21733 is only 15mm square and has a range of about 500 feet. The RFD21733 module is about one quarter the cost of the RFDANT. So why would you use the RFDANT? There are many reasons: The RFDANT is hermetically, fully potted and over-molded, has an industrial rugged enclosure and the full radio system and processing is all built into the Antenna structure itself. The RFDANTs mounting does not require a PCB at all, simply just drill a hole into your enclosure and feed the 8 inch cable through and apply a nut and your RFDANT is mounted and ready for use. The RFDANT does not have impacts from proximity effects from near-by metal enclosures and objects. The RFDANT has a perfect antenna pattern which provides extraordinary, consistent repeatable performance.

The RFDANT's Revolutionary Patent Pending design enables it to reach distances of 2,000 feet, while still being an Ultra Low Power device. This huge range is reached without any power amplifiers at all, it's unique design is responsible for it reaching these great distances without any extra battery drain or extra power. The RFDANT makes it easy for you to satisfy GREEN directives due to its unique design and ultra high performance.

The RFDANT fits in the palm of your hand and looks like an Antenna, but of course it is much more since it is the whole radio and processing system in one unit. There are no RF cables at all, simply connect +V, GND, and a few logic signal wires based on your application and you are done. There is no need for PCB layout either. You can directly connect to the 11 pin, 8 inch cable extending out of the bottom of the RFDANT.

The RFD21733 is an ideal partner with the RFD21743 or RFD21742 RFDANTs. They can communicate with each other using the R FDP8 protocol with switch logic IO or Serial UART. You can mix and match them as well, with using RFD21733 on one end of your system and an RFDANT on the other.

The RFD21733 is a perfect fit when you need ultra small size and ultra low cost, and the RFDANT is an ideal solution when you need ultra long range and do not want to place any parts onto your PCB.

Even if you will not be using the RFDANT for your application, it is still highly recommended to place the 11 pin connector footprint on your PCB for the RFD21733 so you can have the option to simply plug in the RFDANT for testing during your proto phases, or if you happen to have a customer come to you and ask for more range, you can simply give it to them by not soldering the RFD21733 and instead plugging in the RFD21742 or RFD21743 RFDANT.

If you have further questions about the trade offs between the Modules and the RFDANTs, always feel free to contact support@rfdigital.com were you will find very quick and helpful answers to your questions.

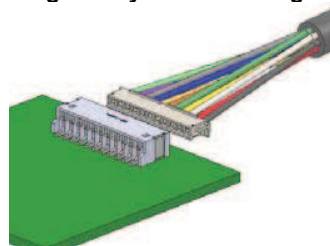
RFD21733 Module

Solders to your PCB with its SMT pads.



RFD21742 or RFD21743 RFDANT

Plugs into your PCB using its 8 inch long cable.



Differences between RFD21742 and RFD21743 RFDANTs

The RFD21742 and RFD21743 are 100% identical hardware, the only difference between the two is firmware loaded at the RF Digital factory.

The RFD21742 is in compliance with CE / ETSI emission requirements and is not for FCC.

The RFD21743 is in compliance with CE / ETSI emission requirements and is FCC Certified and Approved.

The high performance of the RFDANT for FCC requires it to work in a 50% duty cycle mode, which means that when you are running it in its 9600-8N1 UART mode, you can send up to 24 bytes in a row and then you must wait a minimum of 24 byte lengths which is about 24mS before you send up to another 24 bytes. For example you can also send 12 bytes, wait 12mS and then send 12 bytes again, effectively yielding a 50% duty cycle. Note this is only a transmit limitation with the RFDANT, it is not related to receive, so if you have a RFD21733 sending 100% duty cycle at full speed, you can receive that with either RFDANT and it will be fine. But when you go to transmit, if you are using the RFD21743 you will need to use a maximum of a 50% duty cycle for the USA and FCC. However when using the RFD21742 which is for Europe and the CE / ETSI markets, there is no duty cycle limitation.

That is the reason there are two part numbers for the RFDANT, the RFD21743 is 50% UART duty cycle for FCC and the RFD21742 is CE and ETSI with 100% duty cycle.

So if you plan on selling into the USA market place, then use the RFD21743, if you are Europe ONLY, then you can use the RFD21742. Also, of course you can use the RFD21743 for USA and Europe.

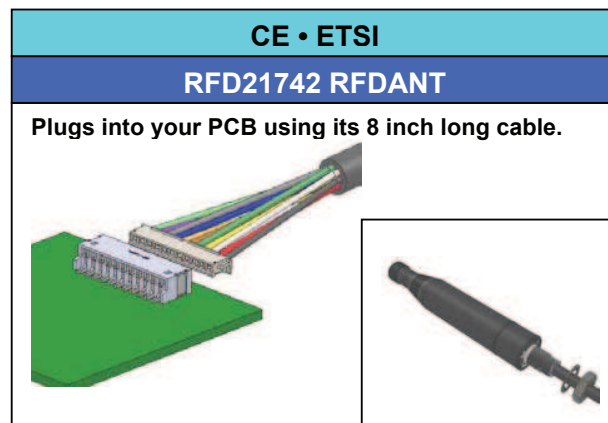
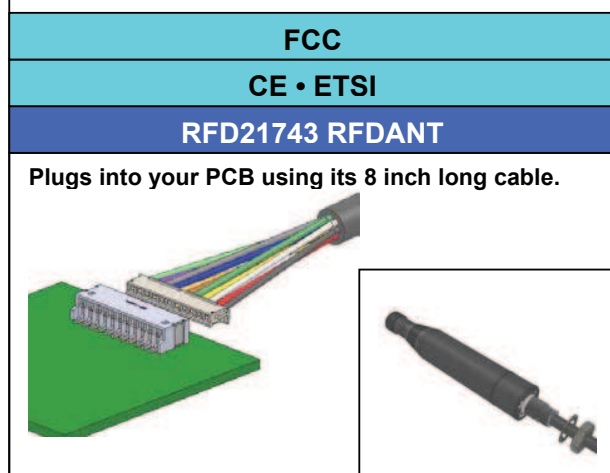
If you are sending in switch mode using the RFD21742, it will send a new packet every 16mS and the hang time for a switch receiver in mode 6 or 7 is 50mS. Where with the RFD21743 it will send a new packet every 24mS to work within the 50% duty cycle limit for FCC and IC.

If you require Canada (IC) Approval for the RFD21743, please contact sales@rfdigital.com.

The impact with switch mode is hardly even noticed between the RFD21743 and RFD21742.

Most common applications are typically with burst data less then 24 bytes per burst, so the difference between the RFD21743 and RFD21742 is negligible, nevertheless the choice is still available for you and they are pin for pin compatible.

Once you test an RFDANT, you will be truly amazed with its performance.



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Revolutionary RFDANT Advantages

The RFD21742 and RFD21743 RFDANT are full 2.4 GHz radio transceivers including the RFDP8 protocol, completely built into an antenna form factor allowing the entire radio transceiver to be outside your product, where only the power and signal cable will extend into your product enclosure to then be connected to your PCB with a simple 1.5mm SMT or THROUGH HOLE connector.

The RFD21742 and RFD21743 is functionally identical to the RFD21733 module and the RFD21772 and RFD21733 Eval Boards work just like the RFD21737 Eval Board except it has an 11 pin 1.5mm connector on it so the RFD21742 or RFD21743 RFDANT can plug into it. The RFD21772 is the Eval board for the RFD21742 and the RFD21773 is the Eval board for the RFD21743. The RFD21772 and RFD21773 each include one RFDANT. You need a pair for a complete system.

The RFD21742 and RFD21743 RFDANTS have been range tested at 2,000 feet which is 4x the range of the RFD21733 which is at 500 feet. No special PCB layout is needed for the RFD21742 or RFD21743 RFDANT, simply just put a connector on your PCB and you are done. All this substantial range increase is achieved all without any increase in current or battery consumption.

The RFDANT is RF Digital's Patent Pending Radio Inside Antenna product, which is a complete radio transceiver and antenna mounted inside of an antenna enclosure, suitable for mounting to virtually any type of end-product, regardless if the enclosure is plastic, metal, glass, really any material.

The entire radio transceiver is mounted inside the antenna enclosure, so there is no loss of RF power to the antenna from the module, and results in the most effective power transfer ratio possible, providing lowest power consumption possible to achieve a specific range.

The radio being inside of the antenna and outside the enclosure allows for more room inside the enclosure for the designers application electronics.

Minimal interference with the internal electronics of the enclosure results in better range and performance of the wireless system.

The actual effective antenna is pushed away from the enclosure, which reduces the effect of holding the enclosure, therefore improving the performance, range and predictability of the users wireless system.

Logic level signals are communicated through an unshielded cable (not coax) to the RFDANT, which can be run for long distances without any loss to the performance of the wireless transceiver.

By the antenna and module being fully outside allows for easy retrofit of nearly any product due to it not consuming any internal space inside the enclosure, drill a hole and screw it in, add a nut inside to secure it and wire the logic level signals to your electronics.

Mount on metal or plastic enclosures with no worry about ground effects.

Stable Antenna Pattern providing substantial, well-distributed, passive-gain for transmit and receive, results longer repeatable range from your wireless system.

For free Schematic and Layout design reviews, send color screen captures or PDFs of your schematic and layout to support@rfdigital.com. RF Digital's Support and Application Engineers are ready to help you get your wireless application running to today. Just send your application questions to support@rfdigital.com and receive direct, fast and accurate answers. We look forward to helping you!!!

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RFD21739	KEYFOBS

RFDANT • RFD21742 • RFD21743 • Compliance Approved



RFDANT • RFD21742 • RFD21743 • Mating Connectors

Mating connectors for the 11 pin RFDANT can be found at Digikey in the USA at: <http://www.digikey.com> or at any other JST distributor. They are standard connectors and you may use other manufacturers.

- 1) Top Entry, Through Hole Type, 11 pos
 - a. Digikey P/N 455-1666-ND
 - b. Manufacturer P/N: B11B--ZR
- 2) Side Entry, Through Hole Type, 11 pos
 - a. Digikey P/N 455-1678-ND
 - b. Manufacturer P/N: S11B--ZR
- 3) Top Entry, SMT Type, 11 pos
 - a. Digikey P/N 455-1690-2-ND
 - b. Manufacturer P/N: B11B—ZR-SM4-TF
- 4) Side Entry, SMT Type, 11 pos
 - a. Digikey P/N 455-1701-2-ND
 - b. Manufacturer P/N: S11B—ZR-SM4-TF

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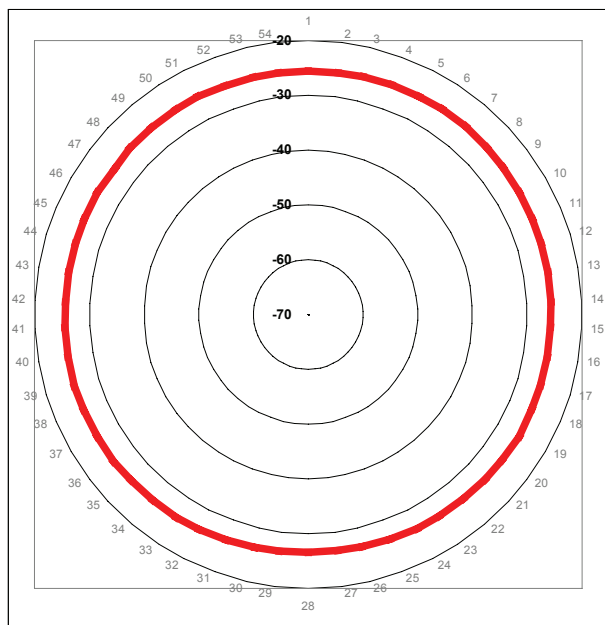


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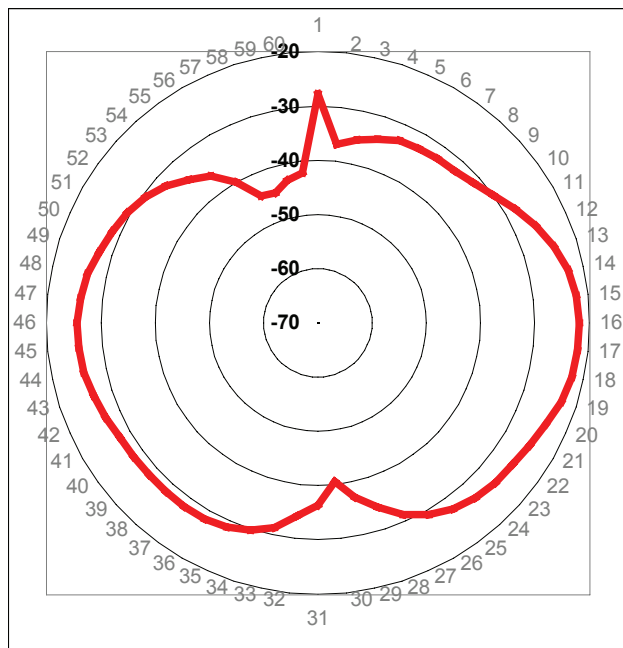
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RFDANT • EXCELLENT ANTENNA PATTERNS



Horizontal Antenna Pattern



Vertical Antenna Pattern

RFDANT RFD21742 and RFD21743 high performance antenna patterns are easily achieved without any RF considerations or knowledge because the 11 pin cable and connector only carries power and data signals so NO RF cable loss at all. RF Digital's Patent Pending RFDANT design is the only device in industry which can achieve this outstanding performance.



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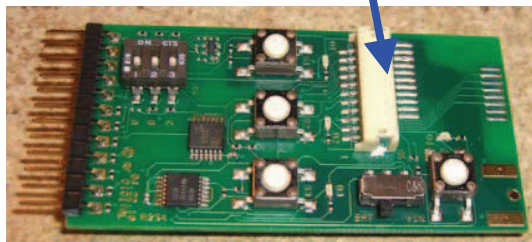
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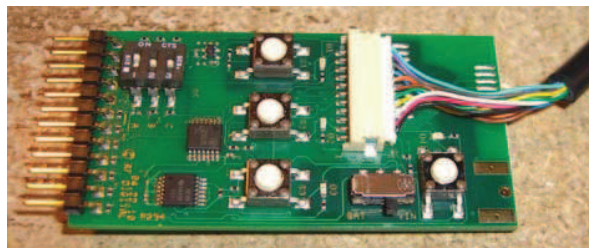
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RFD21739	KEYFOBS

RFD21772 & RFD21773 Eval Boards for RFDANT

RFD21772 / RFD21773 Eval board with RFDANT 11 pin connector.

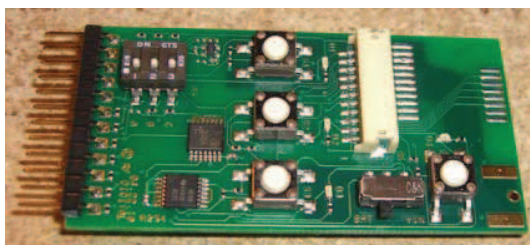


RFD21772 / RFD21773 Eval board with RFDANT cable plugged into the 11 pin connector.



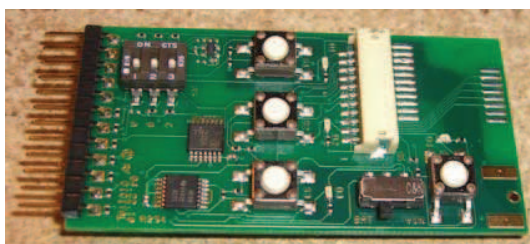
RFD21772 Eval Board for RFD21742 RFDANT

When ordering part number RFD21772, you receive an RFDANT eval board pictured below AND you also receive an RFD2142 RFDANT. For Eval board usage instructions, see sections below.



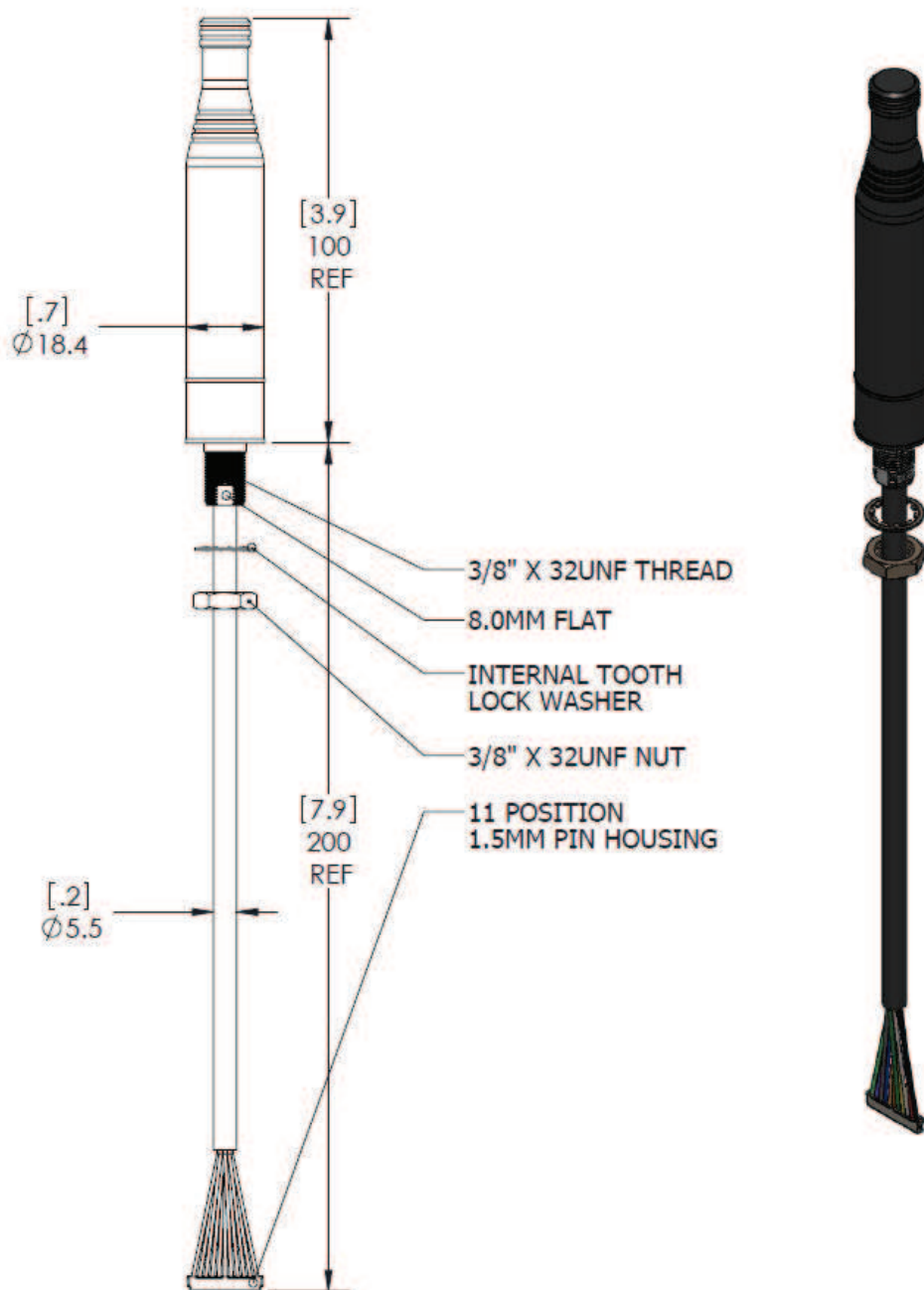
RFD21773 Eval Board for RFD21743 RFDANT

When ordering part number RFD21773, you receive an RFDANT eval board pictured below AND you also receive an RFD2143 RFDANT. For Eval board usage instructions, see sections below.

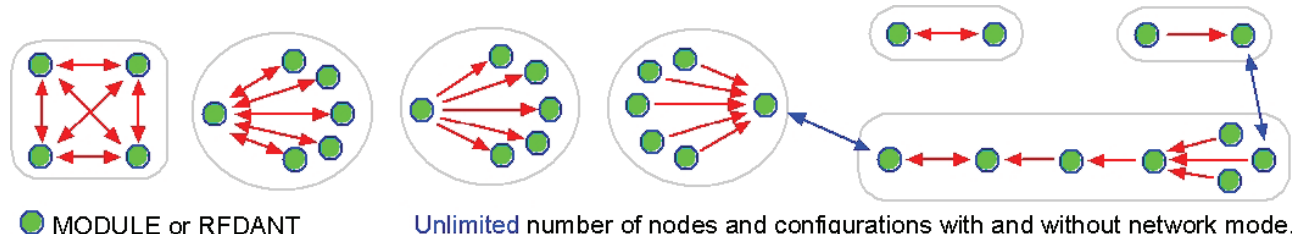


RFD21773 • RFD21743 • RFDANT • Dimensions

Flexible RFDANT cable does not have any shielding due to its revolutionary design and therefore does not need it. The 11 conductor cable is flexible and can easily conform to fit your enclosure. Simply drill hole into your enclosure, insert the RFDANT and you have instant excellent range performance.

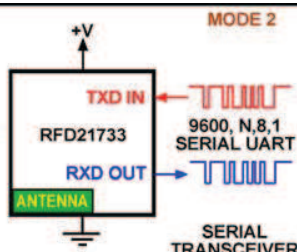
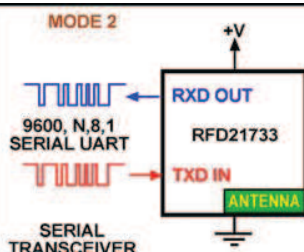


RFD21733 • RFD21735 • RFD21742 • RFD21743 • Usage Examples



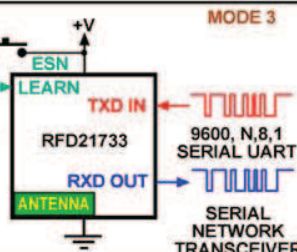
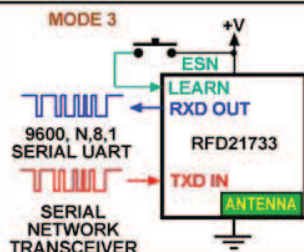
RFD21733 • RFD21735 • RFD21742 • RFD21743 • Applications

Bidirectional serial transceiver normally sits in receive mode, receiving and outputting serial bytes out of the RXD pin, as they come in. When user sends data into TXD pin it automatically switches to transmit.



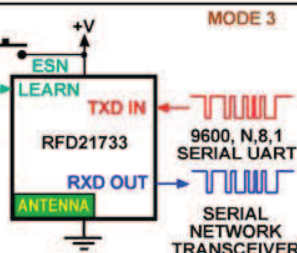
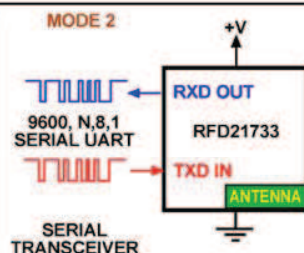
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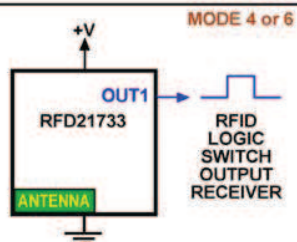
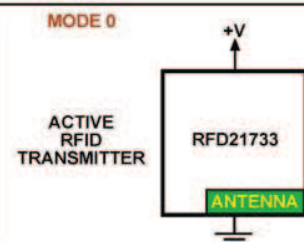
Bidirectional serial transceiver normally sits in receive mode, receiving and outputting serial bytes out of the RXD pin, as they come in. When user sends data into TXD pin it automatically switches to transmit. The receiver will only respond to transmitters if it has learned their ESNs.

Bi-directional serial transceiver normally sits in receive mode, receiving and outputting serial bytes out of the RXD pin, as they come in. When user sends data into TXD pin it automatically switches to transmit.



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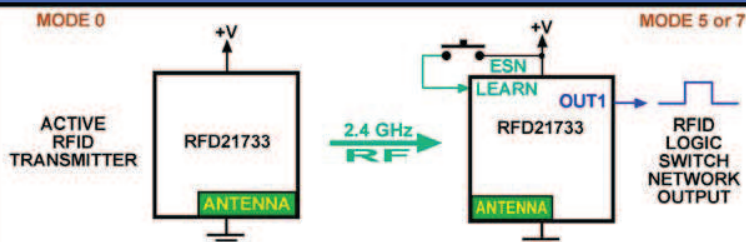
In this mode, simply apply 1.9 to 3.6 VDC (typically 3V), and the RFD21733 and it will automatically transmit once every 2 seconds as an RFID transmitter. With every transmission it also sends it's unique 32 BIT ESN (Electronic Serial Number).



Once every 2 seconds, depending on the configured mode, OUT1 will output a level high signal for a duration of 20 or 500 milliseconds. The idle state is low.

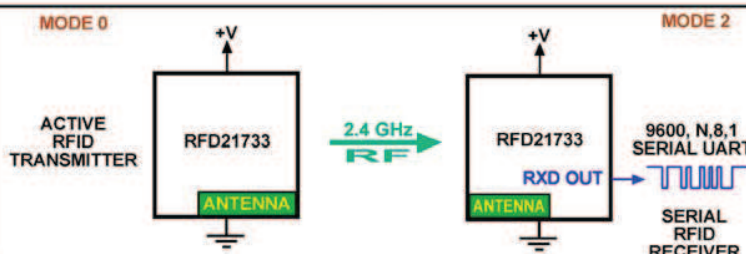
RFD21733 • RFD21735 • RFD21742 • RFD21743 • Applications

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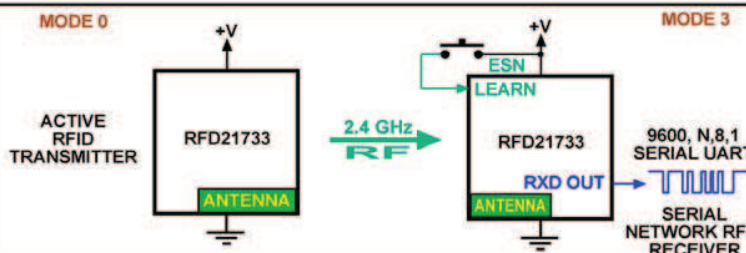
Once every 2 seconds, depending on the configured mode, OUT1 will output a level high signal for a duration of 20 or 500 milliseconds. The idle state is low. The receiver will only respond to transmitters if it has learned their ESNs.

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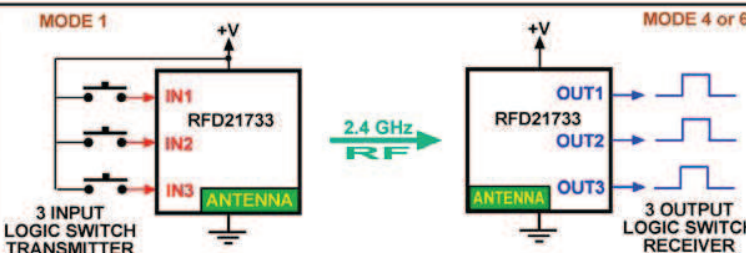
Once every 2 seconds, the RXD pin will output 5 bytes. Byte 1 will have bit 4 and bit 1 set, and bytes 2-5 are the 32 bit ESN of the RFID transmitter.

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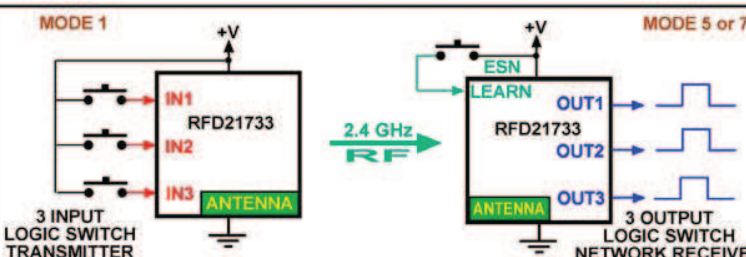
Once every 2 seconds, the RXD pin will output 5 bytes. Byte 1 will have bit 4 and bit 1 set, and bytes 2-5 are the 32 bit ESN of the RFID transmitter. The receiver will only respond to transmitters if it has learned their ESNs.

The RFD21733 stays in (2 uA) deep sleep, until any combination of the 3 buttons are pressed, then it will transmit the state of all 3 inputs. With every transmission it also sends it's unique 32 BIT ESN (Electronic Serial Number).



OUT1, OUT2 or OUT3 (follow) output any transmission received by the transmitter switch states IN1, IN2 or IN3. Depending on the configured mode there is a 20 or 500 millisecond hang time.

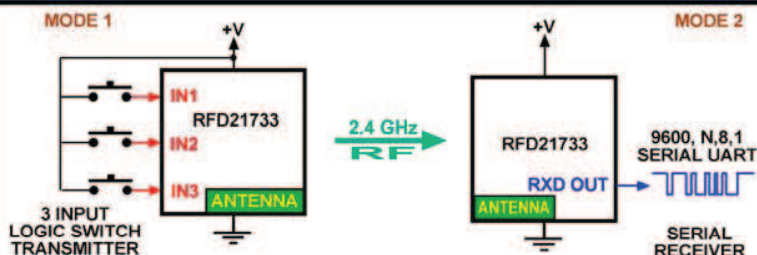
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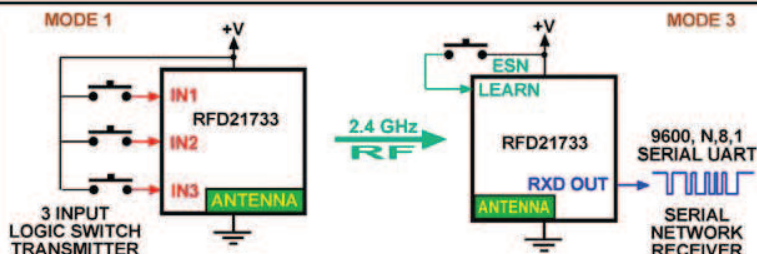
RFD21733 • RFD21735 • RFD21742 • RFD21743 • Applications

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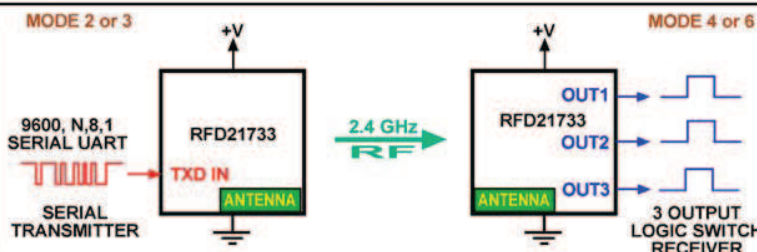
When a transmission is received. The RXD pin outputs 5 bytes. Byte 1 (bit 4,5,6) are the transmitter input states IN1, IN2, IN3. Bytes 2-5 are the 32 bit ESN of the switch transmitter.

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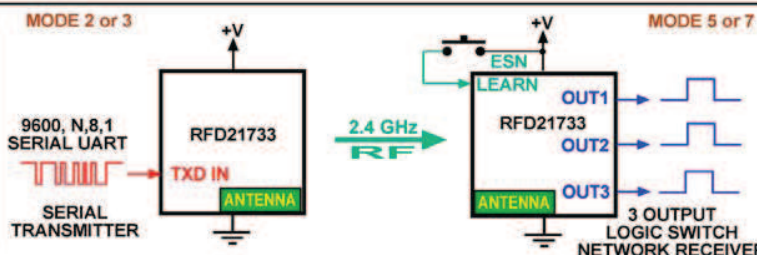
When a transmission is received. The RXD pin outputs 5 bytes. Byte 1 (bit 4,5,6) are the transmitter input states IN1, IN2, IN3. Bytes 2-5 are the 32 bit ESN of the switch transmitter. The receiver will only respond to transmitters if it has learned their ESNs.

Apply a single byte into the TXD pin to control the states of the switch receiver. Bit position 4,5,6 represent OUT1, OUT2, OUT3 on the receiver, all other bits must be zero. The receivers outputs states can not be updated any faster then once every 20 milliseconds.



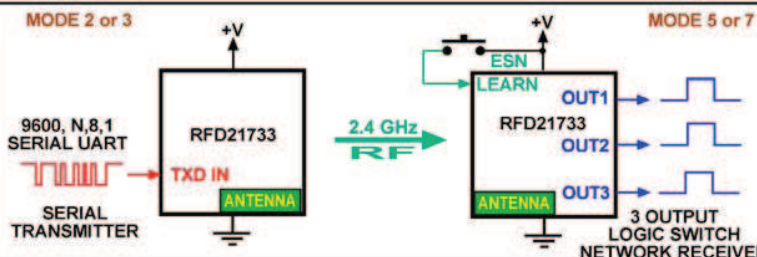
When a byte is received by the serial transmitter, OUT1, OUT2, OUT3, follow the states in bit position 4,5,6. Depending on the configured mode there is a 20 or 500 millisecond hang time.

Apply a single byte into the TXD pin to control the states of the switch receiver. Bit position 4,5,6 represent OUT1, OUT2, OUT3 on the receiver, all other bits must be zero. After sending the single byte, wait at least 20 milliseconds before sending again.



When a byte is received by the serial transmitter, OUT1, OUT2, OUT3, follow the states in bit position 4,5,6. Depending on the configured mode there is a 20 or 500 millisecond hang time. The receiver will only respond to transmitters if it has learned their ESNs.

To address a specific switch receiver, apply 5 bytes into the TXD pin. Byte 1, bit position 4,5,6 represent OUT1, OUT2, OUT3 on the receiver, all other bits must be zero. Byte 2-5 is the specific receiver's ESN. After sending the 5 bytes, wait at least 20 milliseconds before sending again.



When 5 bytes are received in a row from a serial transmitter, OUT1, OUT2, OUT3, follow the states in Byte1, bit position 4,5,6. Depending on the configured mode there is a 20 or 500 millisecond hang time. The receiver will only respond if byte 2-5 contains it's ESN.