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<ul> <li>★ Forum Finished User PIC</li> <li>+ Reply to Thread</li> </ul>	AXE Projects User Projects - Comm	unication Using INH	AOS RF2400 2.4 gHz RF Moc Results 1	dules to 10 of 32	age 1 of 4 1 2	3 ) Last »
Thread: Using INHAOS RF	2400 2.4 gHz RF Modules		Thread T	ools Search Thre	ead Rate This Th	nread Display
03-08-2011, 10:11						#1
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<ul> <li>Using INHAOS RF2400 2</li> <li>The RF2400x is a 2.4Ghz transor NRF24L01+ modules. While these NRF24L01+ modules. While these The INHAOS modules cost \$2.9 from Spark Fun. Functionally the Vdd. The INHAOS module has no chip antenna while the INHAOS max output of 5 dBm compared on a chip antenna . This would g</li> <li>The INHAOS has no 250Khz a</li> <li>To write to registers 28 &amp; 29 y then write the register and then of 3. A hard reset may be required Suggest keeping the default add the same location.</li> <li>These programs are for basic tee as a dedicated receiver and the or an antenna is a compared to a suggest here.</li> </ul>	2.4 gHz RF Modules eiver module from INH/ e modules can commu 9 each with free shippin by are basically the sam o regulator and can only has a PCB trace antenr to the Nordic 0dBm. It w ive the INHAOS a big ra AIR Data Rate option. ou must first write the " to a hard reset. after changing the defaur resses unless multiples sting or the INHAOS RF other as a dedicated tra	AOS ( China). These modules nicate with the Nordic module g from China, compared to > le, however the Nordic Modul / take Vdd up to 3.6 volts. Th a. This gives Nordic module vould be easy enough to pee ange advantage over the NOI Activate" command byte ult receive addresses for the star networks are set up in 2400 Transceivers. One prog nsmitter. Automatic packet h	s are meant to be es, the programin \$19.00 each plu le has an on boar he Nordic Module an edge on rang I off the trace ant RDIC with 5dBm Data Pipes gram sets the Mo handling is not en	e compatible with ng is slightly differ s shipping for the rd 3.6V regulator a e module has an / e. However the IN enna on the INH/ vs 0dBm.	the Nordic rent. Nordic modules and can take 5v Antenna Factor VHAOS has a AOS and solder

## USING INHAUS KE2400 2.4 gHZ KE MODULES

demo. These are intended to show how to program the modules and to use the HSPI interface and to do range testing.

I will post code for automatic packet handling soon.

There are several subroutines (functions) that are not used. These functions have been tested to work and can be used in a modified program.

The code is written for a 20x2. You will need to modify the pins / variables to suit your Picaxe

Load I\_2400\_TX into one Picaxe/Module combo Load I\_2400\_RX into another Picaxe/Module combo Keep Download connector connected to receive module. Hard reset both boards.

NOTE: The receiver was detuned to allow close testing between modules. For maximum range, you will need to change the line for register 6 in config\_registers to:

$\cap \cap$	10.
	JC.

	'write Register 6 low csn hspiout (\$26,%00000111) 'REG 6 Data Rate 1 nbps LNA Nornal Output 5 dbm high csn	
	4	▶
Ha	ve fun !	
20 Ph	x 2 Connections ysical Pins RF2400 Pins	
Pic	caxe RF2400	
Pin Pin Pin Pin Pin Pin Pin Pin		

	Pin 11 SPI Clock			
	<ul> <li>Attached Files</li> <li>I_2400_TX.bas (8.9 KB, 243 views)</li> <li>I_2400_RX.bas (7.1 KB, 144 views)</li> </ul>			
	Last edited by Goeytex; 15-11-2011 at 20:29. <b>Reason:</b> Change CSN to Pin b.4 to free up Hserrin.	Change code accordinglyna		1
Blog this Post		Reply	Reply With Quote	
10-08-2011, 20:34				#2
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<ul> <li>I now have these modules communicating with automatic packet handle the Nordic nRF24L01+ with a few minor but important differences.</li> <li>If enough are interested, I will write a detailed tutorial on how to use the reply the more motivated i will be to write it up.</li> </ul>	ling and auto ACK. Alr this transceiver with a	nost identical code a Picaxe. The more	e to e that

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11-08-2011, 00:39

Paix o

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#	2
TT	J

http://www.nicaxeforum.co.uk/showthread.nhn?19036-11sing-INHAOS-RF2400-2-4-gHz-RF-Modules&highlight=NRF24101

Join Date: Aug 2008 Location: West Midlands, UK Posts: 1,104	I am certainly interested in these modules and would love it if you get sufficient interest to warrant effort of writing a tutorial. The devices seem just right for use in a beehive instrumentation and logging application, where a significant number of such devices could eventually be used.
Blog this Post	Reply Reply With Quote
11-08-2011, 01:21	#4
<b>papaof2</b> Senior Member Join Date: Jan 1970 Location: Georgia, USA Posts: 1,201	<ul> <li>Content of the second se</li></ul>

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#5

11-08-2011, 12:43		#5
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	Count me among those interested. I have a pair in transit from China - should be here in a couple of weeks.	
	Hey John, I got mine in about 7 days. Shipped to Texas	

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		2

11-08-2011, 13:11	#6
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	Control of these could be set up in close proximity without conflict. Originally Posted by Paix Intervention and logging application, where a significant number of such devices could eventually be used.
	a lot of these could be set up in close proximity without connet.
Blog this Post	Reply Reply With Quote
14-08-2011, 11:13	#7
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<ul> <li>I have decided not to do a formal tutorial at this time. But the good news is</li> <li>I have written the attached code that is highly commented and includes a whole bunch of function routines that will drastically simplify programming and shorten your learning curve. Each function is commented .</li> <li>All you have to do is change/write code in the program loop while calling the functions as needed. There are no "gotos, only gosubs (calls). So be sure keep track and not get nested too deep.</li> <li>This code should act as a tutorial as you read &amp; study it and experiment with these very nice little modules. If you find a bug in any of the functions, please let me know.</li> <li>Note that I have changed the CSN pin to b.4 to allow use of hserin on b.6 if so desired.</li> <li>I did my homework now you get the rewards !</li> <li>Note:</li> <li>Picaxe interpreter overhead will prevent really hi speed data transfer in certain modes, However sending a 32 byte packet with ACK every few ms should be very doable when</li> </ul>

running an X2 Picase at 64mhz.

	For full speed data streaming use Shockburst mode + DYNPD & no ACK which basically takes the Picaxe out of the picture except for sending the data via hspi to the RF2400. Just keep pumping data to the TX FIFOS as fast as you can < 2mbps) . and it auto-magically appears on the receiving module. You could stream audio or even some video with this module with the air data rate set to 2 mbps and HSPI at ful speed. Refer to the BK2401 datasheet or the Nordic NRF24L01 + Datasheet. Just need need to digitize the audio or video data first. In this scenario the Picaxe is simply used to initially configure the registers and act as "glue logic."			
	Cheers !			
	Attached Files			
	RF_2400_FUNCT.bas (11.6 KB, 226 views)			
	Last edited by Goeytex; 14-08-2011 at 14:16.			
Blog this Post	Reply Reply With Quote			
14-08-2011, 12:46	#8			
Paix Senior Member Join Date: Aug 2008 Location: West Midlands, UK Posts: 1,104	Many thanks Goeytex, I'm sure that what you have provided should more than suffice and is gratefully received. I'm on the verge of being away for a few weeks, so can't take the chance of an order for RF modules getting sent back to China by the Post Office because there is no one to sign for them, so will pick up three to play with when I get back.			
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14-08-2011, 21:31

#9

papaof2Senior MemberJoin Date:Jan 1970Location:Georgia, USAPosts:1,201	Thank you! A pair of modules should be he John	re Tuesday, so I have time to read the	code before I start to play ;-)
10.00.2011.21.15			#10
IB-08-2011, 21:15 Ibenson • Senior Member Join Date: Jan 1970 Location: Nova Scotia, Canada Posts: 2,284	Very interesting, and thanks very much for I found the data sheet for the module (und products_id=35), but not for the chip. Can	<sup>-</sup> the well-commented code. er "Download", here: <u>http://www.inhaos</u> you point to where you got the informa	s.com/product_info.php? tion about controlling the chip?
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20/10/2010
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19-08-2011, 13:43

Ibenson • Senior Member Join Date: Jan 1970 Location: Nova Scotia, Canada Posts: 2,284	Thanks for the links, and thanks again for all the work in making this picaxeable.
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29-09-2011, 19:50	#13
cachomachineMemberJoin Date:Dec 2010Location:canadaPosts:97	Hi I am running the I_2400_RX.bas in the simulator trying to learn how it is working but it gives me a "stack error - more nested gosubs than the stack allows" after the program loops 8 times. also it seems to miss one digit to the instruction on line74 hspiout (%00100011,%0000001) I think it should be hspiout (%00100011,%0000001) Cacho
Blog this Post	Reply Reply With Quote
29-09-2011, 20:51	#14
nick12ab • Senior Member Join Date: Jan 2011 Location: UK Posts: 4,450 Blog Entries: 14	It appears to be instantly re-interrupting before the return command.
Blog this Post	Reply Reply With Quote
30-09-2011, 00:12	#15
cachomachineMemberJoin Date:Dec 2010Location:canada	I also notice that the I_2400_TX.bas is doing the same thing, could it be a bug in the simulator program? I am using the 5,4,0 version

Posts: 97	Like to see what goeytex thinks about it.
Blog this Post	Reply Reply With Quote
14-11-2011, 17:41	#16
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<ul> <li>For clarity the the extra "0" should be included but hspi will still send out a Hex byte "1" or a Decimal byte "1" regardless. In other words a binary 000001 is the same as a binary 00001 or a 0001. The code operation should not be affected. That was simply a typo, that does not affect anything. Certainly change it in your code though.</li> <li>As far as the stack error goes, my guess is that the code does not necessarily lend itself to simulation because the interrupts are not being generated in the simulator properly. The simulator is not aware of the pullup resistor on c.5 which</li> <li>is used to detect the interrupt generated by the RF module on data receive, therefore going directly to the interrupt routine without actually receiving data. Set the interrupt pin (c.5) high in the simulator before running the code and then step through it.</li> <li>To simulate a data packet received in the receiver code momentarily take pin C.5 low.</li> <li>Yes that was it. It simulates ok if you put c.5 high before stepping through the code.</li> </ul>
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03-05-2012, 20:34	#17
AussieFlyBoy • New Member Join Date: Mar 2010	Goeytex, I'm playing with a couple of the NRF24L01+ and am trying to get them going with a 20x2 without any joy.

Do you have any simpler code snippets that can steer me in the right direction as I'm feeing particularly dumb not being able to get these talking !

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04-05-2012, 10:03

Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<ul> <li>♥FlyBoy</li> <li>Attached is 20x2 Code for the NRF2401+ It should get you going.</li> <li>Pay attention to the notes in the code as to where to include pull up and pull down resistors.</li> <li>Don't let the size of the code daunt you. While not exactly "simple", it is really quite "straight forward" and is organized into sub routines to make testing &amp; experimenting easier.</li> <li>I am working on a 20 dBm version of this module/chip that will have some better range.</li> <li></li></ul>
	Last edited by Goeytex; 04-05-2012 at 10:14.
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04-05-2012, 22:22	#19
AussieFlyBoy • New Member Join Date: Mar 2010 Location: Aboard Posts: 2	Thanks Goeytex, an evening with your code, the manual, and the digital 'scope narrowed down the culprit - the breadboard ! Scotch for you whenever you're in this part of the world  These aren't that bad once you get the hang of them

28/10/2016

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2010		00 2.4 girz itt modules i age z	
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10-08-2012, 15:47			#20
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	<b>Improved Code</b> I have completely re-written the code for the new 20dBM RF2400PA module. Look soon for range > 1Km . Attached is the new code and a schematic.	nese INHAOS RF modules. It i or an even more powerful 240	s much cleaner now and also supports the 00 MHz Transceiver from INHAOS with
	Attached Files RF2400_PICAXE _DEMO.bas (8.4 KB	, 103 views)	
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used to detect the low interrupt signal supplied by the RF2400 IRQ output. At power up C.5 defaults to an input and will be floating until the RF2400 supplies either a high or a low signal. Putting a pullup on c.5 insures that the pin will not float and cause a false interrupt. Blog this Post Reply Reply With Ouote #23 23-08-2012, 09:05 greenmen • B New Member Hello Goyetex, nice work out there! Join Date: Aug 2012 I'm also trying to run Inhaos RF2400P but with my AVR project. I've got similiar library but for nRF24L01+. You Location: poland mentioned in first page that there are "minor but important differences" between those two modules. Could You put 1 Posts: some light on those differences, please? I cannot connect between two modules, I don't know what I'm doing wrong... **Blog this Post Reply With Quote** Reply #24 01-09-2012, 12:02 Goeytex • Senior Member The differences are that the INHAOS RF module does not support the 250Khz data rate and that it has a second Join Date: Feb 2010 register bank (Bank1) that can only be accessed by first using the the ACTIVATE command byte followed by 0x53. Location: Texas Posts: 2,817 Bank0 must be active in order for the RF2400 module to work. ACTIVATE followed by 0x53 toggles the active bank. You can check which bank is active by reading Status register, bit 7. The best way to to this is to send 0xFF (NOP) to the module and then read in the status register bits. If bit 7 = 0 then Bank0 is active. If bit 7 = 1 then Bank1 is active. Most of the the bank 1 registers are undocumented and write only.

You can find AVR reference code HERE

Last edited by Goeytex; 02-09-2012 at 23:58.

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07-11-2012, 19:54

#25

tony_g Senior Member Join Date: Feb 2011 Location: windy lethbridge,canada Posts: 356	<ul> <li>glad i found this, i have a couple of RF 2400 nano modules coming in a few days hopefully.</li> <li>i have not worked with rf with the picaxe yet or any sort of spi so im a bit uneasy at the moment but have read the datasheet for the chip and have read through your provided code goeytex which will save alot of first time headaches, thanks.</li> <li>hopefully it wont be too daunting of a task to finally get my head around and get working successfully.</li> </ul>
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07-11-2012, 22:25	#26
tony_g Senior Member Join Date: Feb 2011 Location: windy lethbridge,canada Posts: 356	<ul> <li>after going through the datasheet again and referring to the test code you have provided i am starting to get a better understanding of the basics of starting to use these modules, thankfully it does not seem so daunting now and im actually quite eager to recieve these now and have a little play around, they were sent out on the 5th and the tracking shows its being classed as an expresspost package so hopefully not too long before i have them, i bought them because they were offered at a damn good price and so small (12mmx12mm) that they can be squeezed into the tiniest of spaces.</li> <li>so until they arrive i shall keep re-reading both the datasheet and your highly commented and informative code provision and start to work out a basic interpretation of what i can use as a starting ground to move on from.</li> <li>thanks for the writeup bill it most definately has helped in understanding these modules and no doubt saved alot of time with trying to understand a new area of which i have yet avoided</li> </ul>
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19-12-2012, 13:57	#27
Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	INHAOS has provided me with several new high power 2.4GHz transceiver modules for testing. These have a PA with TX power > 20dBm and should give an LOS range of > 1000 meters. I will be writing evaluation / demo code for these over the holidays and will post in a new thread when done. May even try doing some frequency hopping with these

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12-01-2013, 23:21

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tony_g Senior Member Join Date: Feb 2011 Location: windy lethbridge,canada Posts: 356	i look forward to reading that, i still shamefully have yet to play with my modules due to being occupied with other projects for my brother but have ordered another 2 rf nano modules to add to the others, just have to invest in a few 20x2 chips as i dont feel like even attempting the m2 bit bang method lol
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21-05-2013, 03:18	#29
Jeff Haas Senior Member Join Date: Oct 2008 Location: California Posts: 151	Goeytex, How is the code for the new modules coming along? And can you point us toward the description on their website? Jeff
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21-05-2013, 12:54 Goeytex • Senior Member Join Date: Feb 2010 Location: Texas Posts: 2,817	#30 Find the second se

	LC1000 Module				
	RF2400PA Datasheet				
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	synhol IRQ = pinb.0 synhol CE = B.1 synhol CSN = B.6	'hardware IRQI 'Chip Enable 'Chip Select Active low)	▲ ▼ ▼
	but later in the routine the Code:	nat responds to the interrupt appears that: 00000, c	▲ ▼
	◀ I think there is a confusionrf24LF01 and inhaos rf2	on of using the IRQ pin that reads, I think mixed i 400 or am I mistaken?	ideas interrupt handling in programs for
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