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## Relay support (initial beta report)

Posted by berkinet - 2010/11/17 13:35

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This is a first report on the beta firmware with support for up to four virtual 4204 relay boards. 16 virtual relays total. Note the software is still in beta (Contact Sean M. for information) and the release will depend on final QA and updating the GUI to support the new features.

One major application for these virtual relays is the ability to watch for zone open and close events directly for ALL zones in your panel. Previously you could watch for Expander module events and RF device events. But, the events from the 8 on-board zones were not visible. Now, with Relay support, these last 8 zones can be made visible. The rest of this post describes how to set up ad2usb and your panel to make this happen.

CAVEAT: I did this on a 20P, your panel may differ.

To get started, the new firmware adds a new section to the ad2usb's built-in config settings:!

```
>Keypad Address      (17) :
>Code                (0000) :
>Zone Expanders Y/N Max allowed: 01
!>module #01 ZN 09-16 (N) :
>!>module #02 ZN 17-24 (N) :
>!>module #03 ZN 25-32 (N) :
>!>module #04 ZN 33-40 (N) :
>!>module #05 ZN 41-48 (N) :
>!Relay Modules Y/N Max allowed: 04
!>module #01 (Y) :
>!>module #02 (Y) :
>!>module #03 (Y) :
>!>module #04 (Y) :Unless you already have one or more 4204s in your system, you will probably want to enable all the relays your panel can support: 4 Relay Modules on a 20P and 2 on a 15P. Check your manual for other models. Note that in the panel settings these modules will show up as addresses 12-15. These instructions assume that no physical 4204 Relay boards are installed.
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Warning: The rest of this post discusses Panel Programming and assumes you have a basic understanding of Programmer mode.

Once the Relays have been configured, you will need to program your panel to activate them. On the 20P this is done through the \*79 and \*80 menus.

The \*79 menu creates logical output device. Each logical output defines a device (Relay, X10 device or built-in trigger). Only the Relay type is supported by the ad2usb. You will probably want to create 8 logical output devices and number them 1-8 for convenience (to map to your on-board zones 1-8). Each logical output device should have Output Type 1 = relay on 4204/4229 module. Then, starting with Device #1 use Module Address 12, and Relay Position 1, and so on for the first 4 (1-4) logical devices. Then use Module Address 13, and Relay Position 1, and so on for the next 4 (5-8) logical devices.

Next, on menu \*80 you will create the output functions that will trigger the logical output devices you just created. The Output Functions should be numbered 1-8 to match your on-board zone numbers and the logical device numbers. This is not required, but it will make things easier to track later on. When creating each Output Function, you will want the Activated By set to 3 = Zone number. Next, for Enter Event select 1 = alarm/fault/trouble. For the Output Action select 2 = Stay Closed. and finally, select the Output Number of a logical device you created in menu \*79. I suggest you keep the numbering straight. Output function 1 to logical device 1, etc. Now, each time any of your 8 zones is closed, you will see a Relay event like this in your ad2usb data stream: !REL:12,01,01

The next step is to reset the zone when the fault clears. To do this use menu \*80 again. This time create 8 new Output Functions, numbered 9-16. These will be identical to the first 8, except that under Enter Event you will select 0 = restore, for the Output Action you will select 0 = Off and for the Output number you will map these to the original 8 logical devices: 9 to 1, 10 to 2, through 16 to 8. Now, when a zone restores, you will see a message like this in your ad2usb data stream: !REL:12,01,00

That is all, except for one possible problem. On my panel, when I added Output Functions 9-16, the panel seemed to want to reference logical devices 9-16 automatically, even if I selected one of the devices 1-8 I had created, the summary display indicated that I had selected a device with X10 capabilities. My solution was to temporarily create logical output devices 9-16 and make them the same as devices 1-8. These were never actually referenced and I can now delete them if I want... But, it got me past the configuration issue. It is also possible that it would have worked anyway, but I did not test that.

Other than the !REL: prefix, Relay devices report the same as Expander devices. See !EXP Messages in this post for more information.

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## Re:Relay support (initial beta report)

Posted by shep29 - 2013/02/27 11:05

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## Re:Relay support (initial beta report)

Posted by shep29 - 2013/02/27 11:13

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When programming in \*79 (Vista 20P), should relay position be the same for all hardwired zones? Or should they be programmed # 1-4 for module 12 and # 1-4 for module 13?

I made the attached cheat sheet for programming \*79 & \*80 based on your post above but not sure I followed correctly. [http://www.nutech.com/images/fbfiles/images/Output\\_Device\\_Programming-939e22d76bf9bcc251c76665e41ccbc9.jpg](http://www.nutech.com/images/fbfiles/images/Output_Device_Programming-939e22d76bf9bcc251c76665e41ccbc9.jpg)

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## Re:Relay support (initial beta report)

Posted by berkinet - 2013/02/27 11:52

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They should they be programmed # 1-4 for module 12 and # 1-4 for module 13?

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## Re:Relay support (initial beta report)

Posted by shep29 - 2013/02/27 12:03

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berkinet wrote:

They should they be programmed # 1-4 for module 12 and # 1-4 for module 13?

OK so I will change the variables in the relay position column to 12/1, 12/2, 12/3, 12/4, 13/1, 13/2, 13/3...

What about the programming in \*80? Does anything have to map to the relay position?

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## Re:Relay support (initial beta report)

Posted by berkinet - 2013/02/27 12:08

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The goal of this configuration is just to have the panel send an event to the relay so you can see the message in the ad2usb data stream. So. it is not necessary to map any panel actions to the relay.

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## Re:Relay support (initial beta report)

Posted by shep29 - 2013/02/27 12:12

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Got it, thanks. Here is the updated cheat sheet for programming the panel in case anyone else is interested. [http://www.nutech.com/images/fbfiles/images/Output\\_Device\\_Programming-0f0e8224a7113de61f8ecbf7707bf8b.jpg](http://www.nutech.com/images/fbfiles/images/Output_Device_Programming-0f0e8224a7113de61f8ecbf7707bf8b.jpg)

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/05/10 14:57

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I'm still hoping that some day you will add support for Address 1 on the virtual relay. 10SE panels only support a virtual relay at that address.

The ad2usb has worked absolutely flawlessly for the last year for me. Because I have to wait for the message, it's very slow to trigger automation events when I have a lot of windows open.. B)

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/05/10 15:47

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Just thinking about this and it seems to me like it should be trivial to just have the ad2usb if set at address 31 follow a different path in the code and send directly to address 1 since we know it has to be at that address.

You willing to help me test the theory? I could easily have a test download ready in the next few days if its a simple bypass circuit in the code.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/05/10 15:53

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Smart thinking, no extra config ugliness.

Yes, I'd be more than happy to test that theory out. :)

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/06/06 23:10

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Hey Sean - Have you had a chance to look at this yet?

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/06/07 00:00

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djrobx wrote:  
Hey Sean - Have you had a chance to look at this yet?

Yep. working on a few projects in the code. That is one of them. Should see an update soon.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/06/08 15:44

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Hay djrobx.

I just published a new beta 7 update. I have had no luck with my 10SE programming relays for testing. I think my test panel is messed up. The menus don't match any docs for 10SE so maybe its a very early SE or its just messed up. Could you test this? Set your address to 31 then enable relay #1 emulation and go into output programming \*80 and enable the relay in \*25 as type 3 for a 4204.

Your version should read V2.2a.7b after you update.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/06/08 17:29

Hi Sean!

I'm pleased to report that this seems to work perfectly.

1) I set \*25 (Wire Exp) to 3. Panel did not freak out.... good sign. :)

2) I coded \*80 to open the relay when zone list 1 is faulted:

Relay 1:

- Action 2 (Closed and stay closed)
- Start Event 2 (Fault)
- Start Zone List 1
- Start Zone Type 0
- Stop Zone List 1
- Stop Zone Type 0

3) I coded \*81 to put zones 02 and 06 in zone list 1.

I now get a nice "!IREL 01,01,01" response I open either door, and "!IREL 01,01,00" when I close them. Brilliant! I later programmed Relay 2, and that's working fine a well.

These panels are limited to 3 zone groups, so you can only monitor 3 distinct sensors, but at least you have grouping, which helps if you have multiple sensors leading to one place. Having support for this is a huge help for my purposes, anyway!

Thanks!!

-- Rob

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## Re:Relay support (initial beta report)

Posted by DKane - 2013/10/08 19:53

Hello there

I recently got the AD2USB (neat toy) and had no problems integrating it with the Vista 10SE. I got the virtual relay configured as well, but the Keypad GUI throws an error (in all versions of Windows I tried it on) when a relay message goes through

"Index and length must refer to a location within the string.

Parameter name: length"

- at System.String.InternalSubStringWithChecks(Int32 startIndex, Int32 length, Boolean fAlwaysCopy)
- at ad2usbgui.MainWindow.ProcessRELMesssage(String Buffer, String Type)
- at ad2usbgui.MainWindow.ProcessBuffer()

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The message itself looks correct - REL 01,01,01.

I wish I could fix it myself, but no source for this portion. I did have success recompiling mystuff and example in VS2010 with additional features that I wanted.

Do you know of this behavior, and are there any plans for a fix in the next version?

An unrelated question, what are people doing with the Relay emulation? I feel like I have a solution looking for a problem. Every need I have basically can be supplanted/replaced with a different stack of hardware/software. Looking for ideas to put it to good use. I don't have an extensive automation environment (yet) - just a PC running this.

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/10/08 20:37

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Can you post the exact message from the panel. The one you are showing is missing parts so I can understand why it parsed badly. I know I recently did a firmware patch to allow relay emulation to work on SE panels.

At some point I plan on pushing the GUI to github. I just need some time to clean stuff up before I dump it to the world. This year we moved everything to git so that was part of the battle.

I totally dig the "I have a screwdriver now where is the dam screw to fix" problem. This is a good question. I will have to ponder this a bit. The problem is lots of what I can do with a relay and a zone I can also just do with home automation state logic and thus I do not need the ladder logic on the alarm panel. I expect some states the alarm panel can trigger a relay on could be useful. That is probably the best place to start and see exactly is possible with the SE panel events and relays.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/10/08 23:29

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An unrelated question, what are people doing with the Relay emulation? I feel like I have a solution looking for a problem. Every need I have basically can be supplanted/replaced with a different stack of hardware/software. Looking for ideas to put it to good use. I don't have an extensive automation environment (yet) - just a PC running this. The specific problem that the relay support resolves is receiving events for the state of hard-wired zones quickly.

Without relay support, your software has to look for the fault messages from the display panel. If you have several faults, it can take 20+ seconds to find out about an event, because the panel lists them one at a time, with 3 seconds between each message. The !EXP messages give you realtime data about wireless sensors, but wired sensors, not so much.

The specifics - I have two doors that lead into my garage. Both have nice hard-wired sensors in the doors. My garage has no windows, and the builder put the light switch in a very cumbersome location. With the AD2USB alerting my automation controller of entry, the light can turn on automatically.

I used to parse the messages looking for the "FAULT xx GARAGE xxx". This usually worked OK. That is, until a nice evening when we'd open a bunch of windows. If I had 3 windows open, it could take up to 15 seconds for the light to finally kick on. That doesn't sound like a long time, but if you're standing in a pitch black room waiting for something to happen, it seems like an eternity. Now with the relay support, it's fast, and it doesn't matter how many other sensors are faulted.

I could have installed some sort of secondary sensors, but it seems silly and wasteful to do that when I knew I had perfectly capable hardware.

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## Re:Relay support (initial beta report)

Posted by DKane - 2013/10/09 08:59

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djrobx wrote:

The !EXP messages give you realtime data about wireless sensors, but wired sensors, not so much.

....

I could have installed some sort of secondary sensors, but it seems silly and wasteful to do that when I knew I had perfectly capable hardware.

Ok, cool, thanks. Do you mind if I ask what Automation controller you use?

My setup is all wireless at the moment (previous owners), and the wired zones I will add won't drive anything critical for my purposes.

What I'm trying to use the panel for is not just Alarms, but "alerts" - monitoring of non-critical functions that should result in an action, either automated or human-generated.

For example, I forgot to close the garage door. I can probably create a GUI plugin that keeps track of item states and sends periodic reminders (email). Then I can react to them, either by going to close it, or to accessing the panel remotely and punching in code+#+7 to trigger the relay. That, in turn would either push the button or the rigged-up standard wireless door opener/closer.

All that works with a real 4204. A virtual one will give me the information, but acting on it requires additional software and hardware. So should I get a 4204 instead? I did read that it doesn't correctly work for the 2-second close when triggered via #+7, but one can write a funny chain to cancel a "close and keep closed" command.

But this is all very cool. The 10 SE is somewhat limited, but good enough for a simple house.

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## Re:Relay support (initial beta report)

Posted by DKane - 2013/10/09 09:13

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mathewss wrote:

Can you post the exact message from the panel. The one you are showing is missing parts so I can understand why it parsed badly. I know I recently did a firmware patch to allow relay emulation to work on SE panels.

At some point I plan on pushing the GUI to github. I just need some time to clean stuff up before I dump it to the world. This year we moved everything to git so that was part of the battle.

Sean,

the message is

!REL:01,01,01

This is from the telnet session to the server running in ad2usbgui

If you do make more of the source available, I would like to make this a gui-less service on Windows, if possible. I'd like to have the facility that goes beyond ser2sock running at all times, for maintaining state and being able for other apps to "see" what any sensor is doing based on its last check-in state. My system is wireless, but each wireless door sensor has a second wired loop that can be utilized. In my case, I can use both in some instances, but only actively monitor the first one. The second could be "information-only" for some yet to be defined purpose, or as a "follower" zone.

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## Re:Relay support (initial beta report)

Posted by djrobx - 2013/10/09 09:49

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Yeah, if you're not using the hard-wired inputs, I can't see any reason to use the virtual relay support.

I use the MiCasaVerde Vera automation controller. What I like about it is that it's free of monthly fees, and open for

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developers to author drivers. Users have written drivers for all sorts of things. As long as the device is serial or ethernet, you can easily write LUA code to control it. I planned to do an AD2USB driver, but MCV started writing their own interface for it as soon as they were aware of it.

It's also very easy to control and get status from Vera through HTTP get requests. If you'd rather treat Vera like a "dumb" controller you can do that too.

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/10/09 10:06

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Looks like 2 places this bug exists. In relay and expander messages parsing. I copied / pasted my code from RFX message section and the format of the message is a lot different.

The failure happens in trying to find this item in the config file. If it finds it then no error will happen. The error happens when it does not find it and then attempts to append to the "ITEMS" view with no config.

Try adding a relay element for your sensor in your config.

This presumes you have the latest GUI with relay templates etc supported.

I will try and get this bug fixed asap but I am in the middle of a commit to allow support for SSL connections to the new ssl enabled ser2sock.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by DKane - 2013/10/09 10:27

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mathewss wrote:

...

The failure happens in trying to find this item in the config file. If it finds it then no error will happen. The error happens when it does not find it and then attempts to append to the "ITEMS" view with no config.

Try adding a relay element for your sensor in your config.

Ah, I tried all sorts of IDs (01, 001, 101) before I posted, but not "401". That works.

Are the positions in the config and bits reversed? I've not tried programming the 02 relay, but Relay 401 Bit 01 appears in Position 4.

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## Re:Relay support (initial beta report)

Posted by mathewss - 2013/10/09 10:36

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Ya I can see how this seems reversed. Its just how my brain works :)

Its binary so 0001 would be relay 1 on. 0101 would be relay 3 and 1.

Re  
Sean M

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## Re:Relay support (initial beta report)

Posted by DKane - 2013/10/09 10:40

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Big Endian, Little Endian - we're all friends here!

Well, I'm back on track, thanks for your help.

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## Re:Relay support (initial beta report)

Posted by DeltaNu1142 - 2013/11/05 05:10

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berkinet wrote:

Warning: The rest of this post discusses Panel Programming and assumes you have a basic understanding of Programmer mode.

Once the Relays have been configured, you will need to program your panel to activate them. On the 20P this is done through the \*79 and \*80 menus.

The \*79 menu creates logical output device. Each logical output defines a device (Relay, X10 device or built-in trigger). Only the Relay type is supported by the ad2usb. You will probably want to create 8 logical output devices and number them 1-8 for convenience (to map to your on-board zones 1-8). Each logical output device should have Output Type 1 = relay on 4204/4229 module. Then, starting with Device #1 use Module Address 12, and Relay Position 1, and so on for the first 4 (1-4) logical devices. Then use Module Address 13, and Relay Position 1, and so on for the next 4 (5-8) logical devices.

Next, on menu \*80 you will create the output functions that will trigger the logical output devices you just created. The Output Functions should be numbered 1-8 to match your on-board zone numbers and the logical device numbers. This is not required, but it will make things easier to track later on. When creating each Output Function, you will want the Activated By set to 3 = Zone number. Next, for Enter Event select 1 = alarm/fault/trouble. For the Output Action select 2 = Stay Closed. and finally, select the Output Number of a logical device you created in menu \*79. I suggest you keep the numbering straight. Output function 1 to logical device 1, etc. Now, each time any of your 8 zones is closed, you will see a Relay event like this in your ad2usb data stream: !REL:12,01,01

For someone who isn't familiar with programming mode, would you be willing to explain the button press sequence? (I've taken over my Ademco panel using this procedure), installed AD2USB, fiddled with the GUI, but I do not know programmer mode & would like to configure these virtual relays. I entered programming mode, \*79 menu, and "01" shows up on my keypad. I do not know where to go from there.

Any help is appreciated.

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## Re:Relay support (initial beta report)

Posted by DeltaNu1142 - 2013/11/06 02:50

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I may have found what I need on page 10 of the manual--I'll give it a try later this week.

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## Re:Relay support (initial beta report)

Posted by berkinet - 2013/11/07 17:08

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DeltaNu1142 wrote:



...

For someone who isn't familiar with programming mode, would you be willing to explain the button press sequence? I've taken over my Ademco panel using this procedure), installed AD2USB, fiddled with the GUI, but I do not know programmer mode & would like to configure these virtual relays. I entered programming mode, \*79 menu, and "01" shows up on my keypad. I do not know where to go from there....

Hopefully you have made some progress. I was wondering what you wanted to use the relays for? If it was to enable advanced mode in the Indigo ad2usb plugin, it is probably not worth the effort since, with Sean's very efficient algorithm, cleared zone detection is really about as fast as using advanced mode.

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## Re:Relay support (initial beta report)

Posted by DeltaNu1142 - 2013/11/07 17:34

In the past few days I realized I didn't really need to go the way of enabling the outputs, so I haven't made progress... but by choice! With what's in the original post and from what I read in the manual, I'm pretty sure I could figure it out if I needed to.

Thanks!

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## Re:Relay support (initial beta report)

Posted by DeltaNu1142 - 2013/11/17 02:37

berkinet wrote:

Hopefully you have made some progress. I was wondering what you wanted to use the relays for? If it was to enable advanced mode in the Indigo ad2usb plugin, it is probably not worth the effort since, with Sean's very efficient algorithm, cleared zone detection is really about as fast as using advanced mode.

My purpose was so that I can detect tripped zones when the alarm is in ARMED state, and it appears that I'll need to do this. In particular, I'd like for the motion sensor(s) to send a tripped state to Vera irrespective of alarm state.

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