Getting Started with the Alarm Octopus

Physical Connections

If this is your first time with the Alarm Octopus, consider getting to know the device on your bench. From experience, this is much nicer than trying to learn whilst on a ladder in a cupboard, trying to balance a laptop and protect it from falling onto the ground.

Regardless of where you do it, hook up at least one wiegand reader. By default the board assumes that any wiegand readers operate on 12V DC. Check the manual if this is not the case. The power and ground, along with the D0/A and D1/B connections. In fact, the reader doesn't need to be powered by the board - it just makes install easier. The LED, buzzer and switch connections are optional.

Now comes to connecting up the OSDP port. Make sure that you supply the board with 12V. This can come from the upstream alarm system, or from a local supply. Just don't connect both. If the wiring between this board and the alarm is particularly long, a 120 ohm resistor might be needed between the A and B connections on the OSDP port. In most cases, this will not be needed.

When you power the board some of the LED's should light up. At a bare minimum the STATUS LED should flash a few times. Depending on what mode the LED is in, this LED might not be flashing after that. Normally the RX light will be lit as well.

Laptop Connection

Configuring the board is done via USB. You will need a MicroUSB cable to plug into the board. We do not supply a cable as most people already have one, and we don't want to increase the amount of e-waste by supplying cables that people dont need. Having said that, if things are not working, make sure the USB cable is actually a USB cable, and not just a cable to charge your phone. Some MicroUSB cables only supply power and don't have data pins.

When plugging in your laptop, we generally advise you not to have your laptop on charge. Although very rare, we have heard of alarm cabling issues where the earth is not really earth, and has the potential to damage the USB port on your laptop due to a weird earth loop. The simple solution is to just not charge your laptop whilst configuring the device.

Serial Connection

The USB port on the device is set up as a Serial Port connection. At this stage, you will need to use a terminal emulator program to connect to the device. CoolTerm is great under MacOS. Under Windows, TeraTerm or Reakterm might suit your needs. Another alternative is to use https://webserial.io/, but a word of warning. It needs internet access, and does not work on all web browsers. Unfortunately it definitely does not work on Safari under MacOS.

The connection settings for USB are 115200 8N1. No handshaking either. In most cases, you should only need to set the 115200 speed.

When you connect with whatever serial terminal emulator you use, you should get a command prompt. You might need to press the enter key a few times for it to come up.

Logging In

The first thing you will want to do is log into the hardware. To do this, type the `serial` command followed by the enter key. The serial number is your default password. To log in, type `password` followed by a space and then the serial number. You now have some options. You can change the password by typing `password set` followed by a space and then your preferred password. If you don't want a password, you can type `password set blank` and no password will be needed. If you change the password and want to go back to using the serial number, type `password set serial`.

The console will lock after about 15 minutes inactivity.

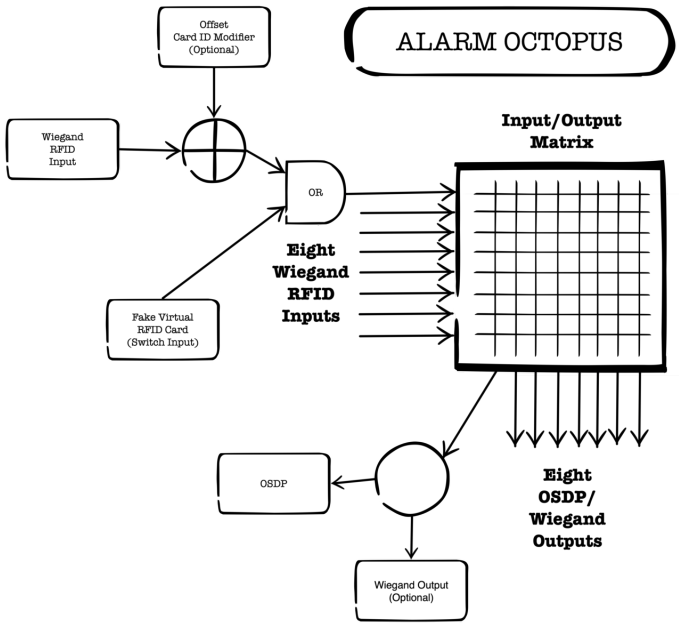
Using an RFID card as a password

At this stage you may decide that using a password is a pain. If so, hook up a reader whilst logged in and badge an RFID card on any connected RFID reader. The serial number of the card will be reported on the screen. In order to use this instead of a password, enter the command `master` followed by a space and then the card number.

You should then test the card again. A message should come up saying that the master card has been used. This card can now be used instead of the password. Of course, the password will still work.

Actually Configuring the Unit

Now that the password has been set, it comes time to configure the unit. Before starting with configuring the unit, it is a good idea to understand the information flow through the device, and the options. We have produced a diagram, but in many ways, it assumes you have some idea what is going. As noted elsewehere, the board takes inputs from up to eight weigand devices and sents them to up to eight OSDP devices. You can also configure it so that eight buttons act as cards. RFID card numbers can also be modified, but you generally won't need to worry about that. And finally, wiegand ports can be configured as outputs if you want to use the hardware more to combine wiegand readers into an existing system.



You can configure the device using commands, just like changing the password. This is OK if the change is simple, but gets a lot more difficult with bigger installations. In order to help there, we have developed a web page to design your install. Even better, this web page can be saved to your laoptop so you don't need internet access on site.

You have two options here. You can either read the manual, and work things out from there. The other option is to use our helper web page. The good thing is that this web page doesn't need internet access and can be saved onto your laptop for future use. It is important to update the page every now and then regardless as we intend to improve the page over time.

https://www.radio-active.net.au/web4/files/alarm/settings.html

Different Modes - PD versus CP

The same hardware has two different modes - PD and CP. The default mode is PD or Periheperal Device, in which the hardware connects to a control panel or alarm system. The other option is CP mode, or Control Panel mode. In this mode, devices such as RFID readers conenct to it, which are then output via wiegand to an external device.

In most cases you will be using PD mode. If you want to get started with CP mode, check out the end of this document.

Basic Configuration Items

The `enable` command is the first command that you should look at. You will likely want to enable all the wiegand inputs, and enable at least one OSDP port as well. Once enabled, you

may need to set the OSDP addresses of each port. This is done with the `osdp` command. The `route` command can then be used to route wiegand readers to specific OSDP ports. By default, each wiegand port is routed to the corresponding OSDP port. For instance, this means that wiegand 5 is routed to OSDP port 5 by default. The one trick is that the the hardware must be restarted by power cycling or issuing the `restart` command whenever you enable or disable OSDP ports. The `enable` command can also be used place OSDP ports into install mode or secure mode. Ports are in install mode by default.

There are other commands, but these are the most important.

Cookbook

Basic Configuration

One Wiegand Input and One Wiegand Output

Wiegand port 1 active, routed to OSDP port 1, with an address of 0. The OSDP port is in install mode. The LED and Buzzer are active on the wiegand port.

```
enable wiegand 1 true # Enable Wiegand port #1
enable osdp 1 true # Enable OSDP port #1
enable led 1 true # Enable LED on Wiegand port #1
enable buzzer 1 true # Enable Buzzer on Wiegand port #1
enable install 1 true # Enable install mode on OSDP Poer #1
route 1 1 # Route Wiegand port 1 to OSDP port 1
osdp 1 0 # Set the OSDP address of OSDP port 1 to 0
```

Two sets of Wiegand inputs per OSDP port

Wiegand ports 1 & 2 routed to OSDP port 1, with address of 8, which is in install mode.
Wiegand ports 3 & 4 routed to OSDP port 2, with address of 9, which is in install mode.

```
enable wiegand 1 true # Enable Wiegand port #1
enable install 1 true # Enable install mode on OSDP Port #1
route 1 1 # Route Wiegand port 1 to OSDP port 1
enable wiegand 2 true # Enable Wiegand port #2
enable install 2 true # Enable install mode on OSDP Port #2
route 2 1 # Route Wiegand port 1 to OSDP port 1
enable osdp 1 true # Enable OSDP port #1
osdp 1 8 # Set the OSDP address of OSDP port 1 to 8

enable wiegand 3 true # Enable Wiegand port #3
enable install 3 true # Enable install mode on OSDP Port #3
route 3 2 # Route Wiegand port 3 to OSDP port 2
enable wiegand 4 true # Enable Wiegand port #4
enable install 4 true # Enable install mode on OSDP Port #4
route 4 2 # Route Wiegand port 4 to OSDP port 2
enable osdp 2 true # Enable OSDP port #1
osdp 2 9 # Set the OSDP address of OSDP port 1 to 8
```

Combining multiple Wiegand ports onto a single Wiegand output

Wiegand ports 5 & 6 combined and output on Wiegand port 7. OSDP for port 7 is disabled, but could be enabled at any time.

```
enable wiegand 5 true # Enable Wiegand port #5
enable wiegand 6 true # Enable Wiegand port #6
enable osdp 7 false # Disable OSDP port #7 - Not needed
route 5 7 # Route Wiegand port 5 to OSDP port 7
route 6 7 # Route Wiegand port 6 to OSDP port 7
output 7 8 # output any Wiegand on OSDP port 7 to Wiegand port 8
```

Configuring Button Presses

Assuming that ports are already configured, configure the hardware so that pressing the external buttons associated with Wiegand ports 3, 4 & 5 send fake RFID cards to their previously assigned OSDP ports. [34 Bits]

```
fake 3 035ae430e0
fake 4 035ccb8520
fake 5 035ae218c1
```

Disabling The Buzzer

Lets assume that you have installed all the readers with the LED and Buzzer wired up. People are now complaining about reader 4 making too much noise, and you want to disable the buzzer, as far as possible.

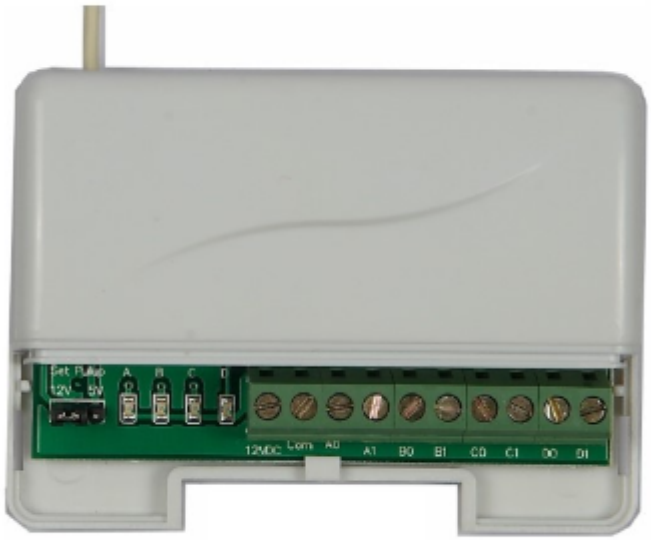
```
enable buzzer 4 false # Disable buzzer
```

Advanced

Combining Wiegand Ports and Modifying The Results

Wiegand ports 1, 2, 3 and 4 are connected to an RF based FOB system where each FOB has four buttons. The receiver unit normally puts the same Wiegand code out one of four outputs depending on which button is pressed. Doing this would require four OSDP to be used on the alarm, and this comes with a significant cost. Therefore we want to feed the four outputs into a single OSDP port. But to do this, we need to modify the RFID code coming in from each button press. As a result, each button will have its own RFID code.

One product that has multiple wiegand outputs like this is the ProKey 4 Channel Wiegand



Receiver.

Some configuration will be needed in the alarm. First, create four user groups, one for each type of button. Then create four users for each FOB, one for each button. Assign the RFID code for each button to the appropriate user. Finally, create a series of four automations of the form that if an RFID comes in and is valid for the group to perform some action.

Configuration In The Alarm

Users with RFID codes assigned to each:

```
User1_Button1, User1_Button2, User1_Button3, User1_Button4
User2_Button1, User2_Button2, User2_Button3, User2_Button4
User3_Button1, User3_Button2, User3_Button3, User3_Button4
```

Groups with Members

```
Group 1: User1_Button1, User2_Button1, User3_Button1
Group 2: User1_Button2, User2_Button2, User3_Button2
Group 3: User1_Button3, User2_Button3, User3_Button3
Group 4: User1_Button4, User2_Button4, User3_Button4
```

Automations

```
If RFID is Valid AND user is a member of Group 1 THEN Arm Alarm
If RFID is Valid AND user is a member of Group 2 THEN Disarm Alarm
If RFID is Valid AND user is a member of Group 3 THEN Arm Alarm and
Close Garage
If RFID is Valid AND user is a member of Group 4 THEN Disarm Alarm
and Open Garage
```

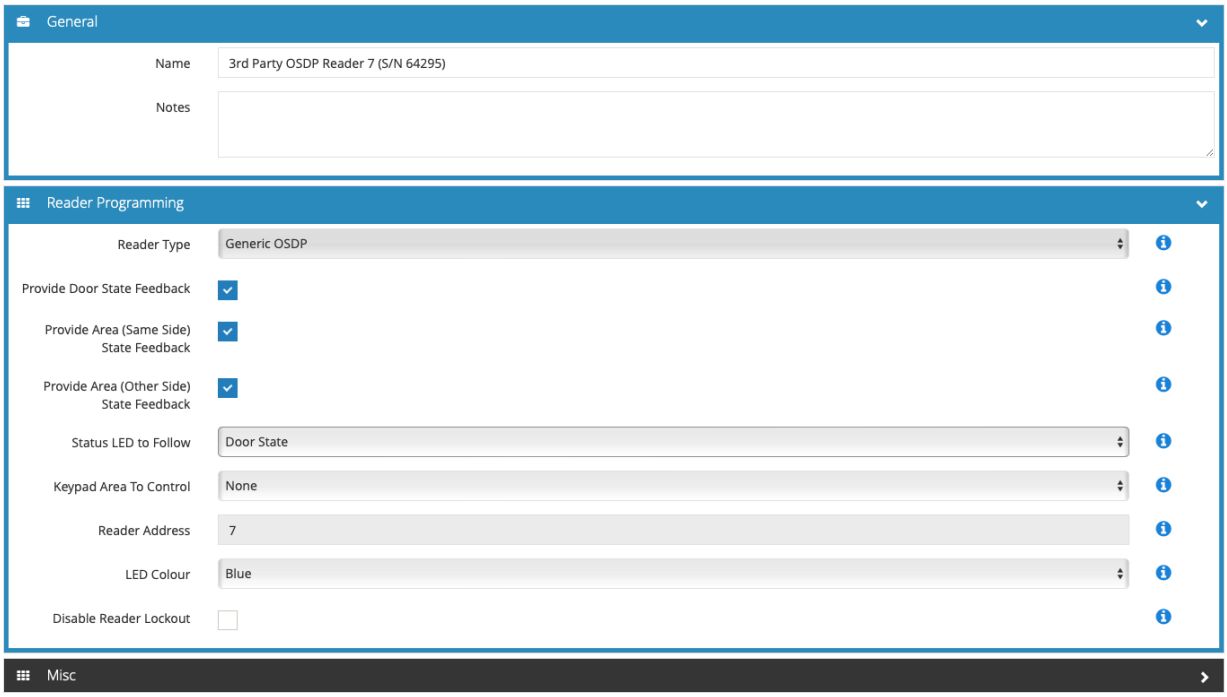
```
offset 1 0000000000
offset 2 1111111111
offset 3 2222222222
offset 4 4444444444
```

Enabling The Relay

THIS DEALS WITH A FUTURE PRODUCT RELEASE, BUT IS BEING INCLUDED FOR COMPLETENESS

Some versions of the board have relays for controlling door strikes. These relays DO NOT appear in the alarm system. To use them, you need to enable relays for the OSDP port, and then configure the alarm system. On the alarm system, you need to confiure the RFID reader on the OSDP port to have its LED follow the 'Door Status'. This will cause the door to unlock in accordance with the system rules for unlocking doors.

Please note that this functionality is experiemental and may not work with all alarm systems.




```
enable relay 1 true # enable the relay on port 1
```

CP, or Control Panel Mode

As noted earlier, CP mode has devices such as RFID readers connecting to it. In return the wiegand codes are output from the board in order to interface to an external device.

Enable CP Mode

The most important step is to enable CP mode. This will cause the hardware to restart if it is not already in CP mode.

```
cp mode true
```

Basic Configuration

Enable virtual OSDP ports and set OSDP Addresses

In CP mode, there are 16 OSDP ports, or endpoints that OSDP PD devices can connect to. Each has its own unique OSDP address. The first step therefore is to set OSDP addresses to ports. If you want to disable a port, set the address as FALSE, NO, or any number greater than 126. Port numbers are between 1 and 16.

```
CP OSDP 1 ADDRESS 1
CP OSDP 2 ADDRESS 2
CP OSDP 3 ADDRESS 3
CP OSDP 4 ADDRESS 4
CP OSDP 5 ADDRESS 16
CP OSDP 6 ADDRESS 17
CP OSDP 7 ADDRESS FALSE
CP OSDP 8 ADDRESS FALSE
```

Set The Physical Wiegand Port for each OSDP Port

The hardware has eight wiegand output ports. Each OSDP port can be assigned to any of the wiegand output ports. Each wiegand output can have multiple OSDP ports assigned to it.

```
CP OSDP 1 WIEGAND 1
CP OSDP 2 WIEGAND 1
CP OSDP 3 WIEGAND 2
CP OSDP 4 WIEGAND 2
```

Setting Security For Each Wiegand Port

Each OSDP port has a number of security settings. They are INIT MODE, SECURE MODE, and ENCRYPTION KEY. Many installers keep the hardware in INIT MODE. This works, but is not as secure as it could be. SECURE MODE is better. Ideally an ENCRYPTION KEY should be set, and this should be different on each port.

```
?????
```

Setting the LED and BUZZER details for each port

This is probably the most complex part of configuring CP mode. The hardware has the capability to activate LED's and BUZZER's on RFID readers based on binary inputs to the hardware. Based on the inputs, the hardware can be programmed to cause LED's to flash different colours and at different rates, and a BUZZER to turn on and off at a different rate for a different time. Different commands can be set if the input is going high, or going low.

The BUZZER can only be activated to turn on and off for a set period of time. The time of each on and off period can be changed so that the BUZZER is always on or always off for that time if desired, or alternating.

The LED can be configured with TEMPORARY and PERMAMENT modes. Essentially, the TEMPORARY mode is used until it expires, in which case the PERMAMENT mode takes over. An example is that the LED might be programmed to flash very quickly for five seconds, and then flash quickly only once a second after that. The LED can also be configured with different 'ON' and 'OFF' colours, such as green and red. If this sounds complex, don't worry. It will make sense when you get used to it.

Each of the inputs for LED and BUZZER need to be pulled to ground to change state.

'TIME' is 0.1 seconds long. Thus, there are 10 TIME units per second. There are eight WIEGAND PORTS, numbered 1-8. A 'COUNT' is a cycle that includes an ON and OFF cycle.

Normally, you will only want to configure actions when the state becomes LOW.

A common way to set up an RFID reader would be for it to be RED most of the time, and GREEN when a card is read. The reader could then go back to RED after a few seconds, or this could happen when the input returns HIGH.

Set the LED's associated with wiegand 1. Set the colour to RED when the input is HIGH and RED when the input is LOW

```
CP WIEGAND 1 LED HIGH PERM 10 0 1 0
CP WIEGAND 1 LED LOW PERM 10 0 2 0
```

Set the LED's associated with wiegand 2. Set the LED to flash RED for 0.1 seconds every second normally. When the input goes low, set the LED to green for five seconds.

```
CP WIEGAND 2 LED LOW PERM 1 9 1 0
CP WIEGAND 2 LED LOW TEMP 10 0 5 2 0
```

Set the BUZZER associated with wiegand 2. Set the BUZZZER to activate for 1 second, then turn off for 0.5 seconds, repeating three times when the input goes low. This would often indicate no access permitted.

```
CP WIEGAND 2 BUZZER LOW TEMP 10 5 3
```

```
CP WIEGAND [WIEGAND PORT]   LED     [HIGH|LOW] TEMP  [ON TIME] [OFF
TIME] [COUNT] [ON COLOR] [OFF COLOR]
CP WIEGAND [WIEGAND PORT]   BUZ     [HIGH|LOW] TEMP  [ON TIME] [OFF
TIME] [COUNT]
CP WIEGAND [WIEGAND PORT]   LED     [HIGH|LOW] PERM  [ON TIME] [OFF
TIME] [ON COLOR] [OFF COLOR]

# When the LED port on Wiegand 3 goes low, FLASH the LED 0.5 seconds
# red and 0.5 seconds green for a total of 5 seconds
CP WIEGAND 3 LED LOW TEMP 5 5 5 2 1
# When the previous rule has finished, set the LED to steady
CP WIEGAND 3 LED LOW PERM 10 0 4 0
# When the Buzzer port on Wiegand 3 goes high, turn the buzzer on
# for 0.2 seconds, and then silent for 0.2 seconds, for a total of 2
seconds
CP WIEGAND 4 BUZ HIGH TEMP 2 2 5
```

LED COLORS

Value	LED Color
0	Off
1	Red
2	Green
3	Amber
4	Blue
5	Magenta
6	Cyan
7	White

Wiegand Extender

There is a special use case where we want to use two boards to extend wiegand over a long distance useing RS485 and OSDP. In this use case, two AlarmOctopus boards are needed, with one configured for PD mode and the other configured for CP mode.

In this use case, we are using wiegand ports 1-8, with OSDP addresses 9-16 on each end. We are assuming that install mode security is used on both ends to simplify the configuration.

PD End - Wiegand Input

```
CP MODE FALSE

enable wiegand 1 true
enable wiegand 2 true
enable wiegand 3 true
enable wiegand 4 true
enable wiegand 5 true
enable wiegand 6 true
enable wiegand 7 true
enable wiegand 8 true
enable osdp 1 true
enable osdp 2 true
enable osdp 3 true
enable osdp 4 true
enable osdp 5 true
enable osdp 6 true
enable osdp 7 true
enable osdp 8 true
osdp 1 9
osdp 2 10
osdp 3 11
osdp 4 12
osdp 5 13
osdp 6 14
osdp 7 15
osdp 8 16
enable install 1 true
enable install 2 true
enable install 3 true
enable install 4 true
enable install 5 true
enable install 6 true
enable install 7 true
enable install 8 true
route 1 1
route 2 2
route 3 3
route 4 4
route 5 5
route 6 6
route 7 7
route 8 8
```

CP End - Wiegand Output

```
CP MODE TRUE
CP OSDP 1 ADDRESS 9
CP OSDP 2 ADDRESS 10
CP OSDP 3 ADDRESS 11
CP OSDP 4 ADDRESS 12
CP OSDP 5 ADDRESS 13
CP OSDP 6 ADDRESS 14
CP OSDP 7 ADDRESS 15
CP OSDP 8 ADDRESS 16
CP OSDP 1 INSTALL TRUE
CP OSDP 2 INSTALL TRUE
CP OSDP 3 INSTALL TRUE
CP OSDP 4 INSTALL TRUE
CP OSDP 5 INSTALL TRUE
CP OSDP 6 INSTALL TRUE
CP OSDP 7 INSTALL TRUE
CP OSDP 8 INSTALL TRUE
CP OSDP 1 WIEGAND 1
CP OSDP 2 WIEGAND 2
CP OSDP 3 WIEGAND 3
CP OSDP 4 WIEGAND 4
CP OSDP 5 WIEGAND 5
CP OSDP 6 WIEGAND 6
CP OSDP 7 WIEGAND 7
CP OSDP 8 WIEGAND 8
```

See the cookbook entries above for buzzer and LED options. They only need to be added to the CP end.