

# AIRcable OS Command Version 0.7 Line Documentation

All AIRcable OS products come with a standard BASIC connection software installed. The program is responsible for controlling the incoming and outgoing serial connections. It controls the SPP profiles available on the AIRcable OS product.

The AIRcable OS supports secure one-to-one type of connections, called the **cable-modes** and service oriented one-to-many and many-to-one type of connections, called the **service-modes**. Each of these modes have a slave mode, which allows incoming connections and a master mode, which initiates connections. Please see later in the text for details.

In Service-Slave mode, the AIRcable OS allows other Bluetooth devices to make connections to the AIRcable OS. This is the factory default mode. The default PIN code is set to '1234'. In this mode the module is discoverable and any device with the right pin can connect to it.

Every time you power the unit, or manually reboot it, you will see that first the LED comes on. This indicates that the AIRcable Operating system is booting. It will take maximum of 10 seconds to boot. The LED will go off when the OS has booted.

At this moment the AIRcable OS starts its services. The BASIC program installed allows reconfiguration and FTP access to the BASIC program and the configuration files for the next 6 seconds. After that and without interaction from the command line interface the FTP and Obex message services will be switched off.

To start the command line interface use a terminal emulator (such as Hyperterminal or Minicom) at 115200 baud, 8N1 and hardware handshake.

Then type three plus +++ and enter and you will get into the Command Line interface, you should see this:

```
AIRcable OS command line v0.7
Type h to see the list of commands
AIRcable>
```

*NOTE: it can take up to 2 seconds to the interface to be launched*

This interface is designed to be user friendly and intuitive. All commands explain themselves interactively. Type a one letter command to execute each command.

## Links:

[Command Line Version 0.7 Package](#)

[AIRcable Open Source Site](#)

[AIRcable Development Blog](#)

## List of commands

## Help *h*

The `h`-command will list you the list of all the commands available, here is the output:

```
AIRcable>h
h: help, l: list
n: name, p:pin, b: name filter, g: address filter
c: class of device, u: uart, d: date
s: slave, i: inquiry, m:master, a: mode
o: obex, j: relay mode pair
e: exit, r: reboot.
```

## Settings listing *l*

The `l` command shows the current settings from the module.

```
AIRcable> l
Command Line v0.7
Name: AIRcable
Pin: 1234
Class: @0000 = 00C2 0104 001A
Baud Rate: 115200 bps
Date: 20050531T192100Z
BT Address: 0050C258512E
BT Status: 00000
Name Filter: AIRcable
Addr Filter: 0050C2
Mode: Service - Slave
Unpaired
```

- `Command Line v0.7` : this is the command line version number.
- `Name: AIRcable` : this is the name other devices will see when the module is inquired
- `Pin: 1234` : this is the pin this module will return, when other devices request it while pairing process.
- `Class: @0000 = 00C2 0104 001A` : The first 2 numbers are the class of device, according to the Bluetooth specification. The 3rd is the version number of the operating system firmware.
- `Baud Rate: 115200 bps` : This are the baud rate setting, it can show the amount of bps, or External if you choosen it on devices that has support for external baud rate settings.
- `Date: 20060531T192100Z` : Some devices like AIRcable Industrial can make use of dates, this is the current date of the module.
- `BT Address: 0050C258512E` : This is the Bluetooth address of this module.

- `BT Status: 00000` : This is the status of the Bluetooth Stack, see the programming manual for further information.
- `Name Filter: AIRcable` : While on cable mode devices can be filtered by name patterns, this is the pattern. In this case the module will connect to modules whose name start with AIRcable
- `Addr Filter: 0050C2` : Plan is to allow filtering on Bluetooth addresses in the future. Not implemented yet.
- `Mode: Service - Slave Unpaired` : This shows the current automatic mode from the module.

### Friendly name setting *n*

With the `n` command you can set the friendly name of the module, to the name you enter here the module will automatically add a number that is unique to each device.

```
AIRcable> n
New Name: AIRcable OS
```

### PIN setting *p*

With `p` you can set the pin for this module, for security reason more than obvious it is recommended that you change the default pin 1234 to any other thing. The pin can be up to 15 characters, and you can use any of the 256 characters that the ASCII code define.

```
AIRcable> p
New PIN: 5AbC{}35asd
```

### Name filtering, and Address filtering settings *b* and *g*

With those commands you can set the filters the module will use

```
AIRcable> b
Enter the new name filter: AIRcable OS
AIRcable> g
Enter the new address filter: 112345
```

### Class of device *c*

This command will let you define the class of device. Check the programming manual for more information about this.

```
AIRcable> c
Type the class ofdevice as xxxx xxxx: 1234 5679
```

### Uart *u*

This command lets you select between internal baud rate, or external baud rate settings (switches on AIRcable Serial OS). If you enter a value of 0 then the uart settings will be taken from the switches any other case it will use the internal baud rate you enter, the value you need to enter is the baud rate divided by 100, for example for 115200bps you need to enter 1152 and for 9600 bps you need to enter 96.

```
AIRcable> u
```

Enter new Baud Rate divide by 100, or 0 for switches: 560

### Date *d*

This command lets you set the internal clock for the module, if the module supports it. The format is: `yyyymmddThhmmssZ`

```
AIRcable> d
```

Insert new date, check the manual for formatting:  
20061118T172600Z

### Manual Slave *s*

This command will manually allow Bluetooth connections to the SPP port for 16s, while this time the module is accessible, and anyone can connect to it, given a correct PIN code. Once you start a manual slave the command line is unavailable until the channel is closed.

```
AIRcable> s
```

Slave Open for 16s. Please wait.

### Manual Inquiry *i*

This command will start inquiring for 16 seconds. While the inquiry is active, the command line interface does not respond to commands.

```
AIRcable> i
```

Inquiring for 16s. Please wait.

Found device: 000A8401C442 AIRcable 321

### Manual Master *m*

This command will initiate a SPP connection to the Bluetooth address typed in manually. If the connection fails you will be returned to the command line.

```
AIRcable> m
```

Please input the addr of your peer: 000A8401C442

### Automatic mode setting *a*

This command will let you chose which is the automatic mode into which the module will get into, when you exit the command line.

Normal procedure to pair two AIRcable OS devices, is to put on into cable slave mode and the other in cable master mode.

Then both will link up automatically and pair. Pairing process will take about 20 seconds. There is a 2 minutes timeout for pairing to succeed. If unsuccessful, the AIRcable will go into manual mode. Pairing procedure has to be started again.

```
AIRcable> a
```

Select new mode

0: Manual

1: Service Slave

2: Service Master

3: Cable Slave

4: Cable Master

Mode:2

#### Obex and ObexFTP enabling/disabling o:

Until version 0.5 Obex and ObexFTP were handled as two different things regarding security. We thought there was no need for this, and unified the concept. Not only that, we had also added another security level, in the past Obex and ObexFTP were made invisible but there were still available. Now you have three different levels of security: Always visible, Visible only for two minutes after boot up or when command line is active, or totally disabled. From the security point of view the last one is the most secure because it will make it impossible to access the file system from outside the device, while the first one is the most weak.

```
AIRcable> o
```

Obex/ObexFTP settings:

0: Enabled only on command line

1: Always Enabled

2: Always Disabled

Choose Option: 2

*Note: If you choose option 2 you will need to choose option 0 or 1 in the future if you want to update your command line version.*

#### Exit e

This command will end the command line interface, and get the module into the automatic mode that was selected before.

```
AIRcable> e
```

Bye!!

#### Reboot r

This command will reboot the unit. It takes about 10 seconds to the unit to be fully restarted, please try keep the unit with electric power while it is rebooted.

```
AIRcable> r
```

Rebooting, please do not disconnect electric power

#### Relay Mode Pair j

This command must be used with are exclusive relay mode, and must be run on the module that is going to do work as “Bridge” (Read Modes section for more information about this), this command lets you pair with the slave peer of the relay chain. It will simply ask you for the Bluetooth Address of the device, will try to pair and in case it is successful advice you about it, any other case it will return to the command line with out any message. From version 0.5 upwards there is a new feature related security on Relay Mode, this new feature allows you to choose between a Service like behaviour or a Cable behaviour, the difference between both is visibility of the relay. On the first one the relay will be always visible to other devices, while on the second one it will be visible only for 2 minutes after the device was booted up. The idea behind those two mode is cascading, suppose you want to cascade two or more relays then

having all your relays visible to anyone can be a problem, this way you can make sure that only those who know the address of your relay can connect to it.

```
AIRcable> j
Enter the address of your peer: 000A8401C442
Please choose which kind of relay you want:
1: Service Relay
2: Cable Relay
```

### Debug z

This is a very helpful feature to use for finding problems. We have 2 levels of debugging plus an online shell when an slave connection is opened, plus the possibility to enable/disable Obex and ObexFTP from only one command.

When you do input z you will be asked for a string, that string has the next format ABCD, where every letter can be either 0 or 1 depending if you want to enable or disable the debug function. For example "0000" switches off all debugging.

This command requires the device to reboot.

- A is for lines dumping
- B is for shell on slave connection
- C is for stack trace dumping
- D is for Obex/ ObexFTP

## **Connection and Automatic Modes**

AIRcable modules support 5 different automatic modes plus a manual mode.

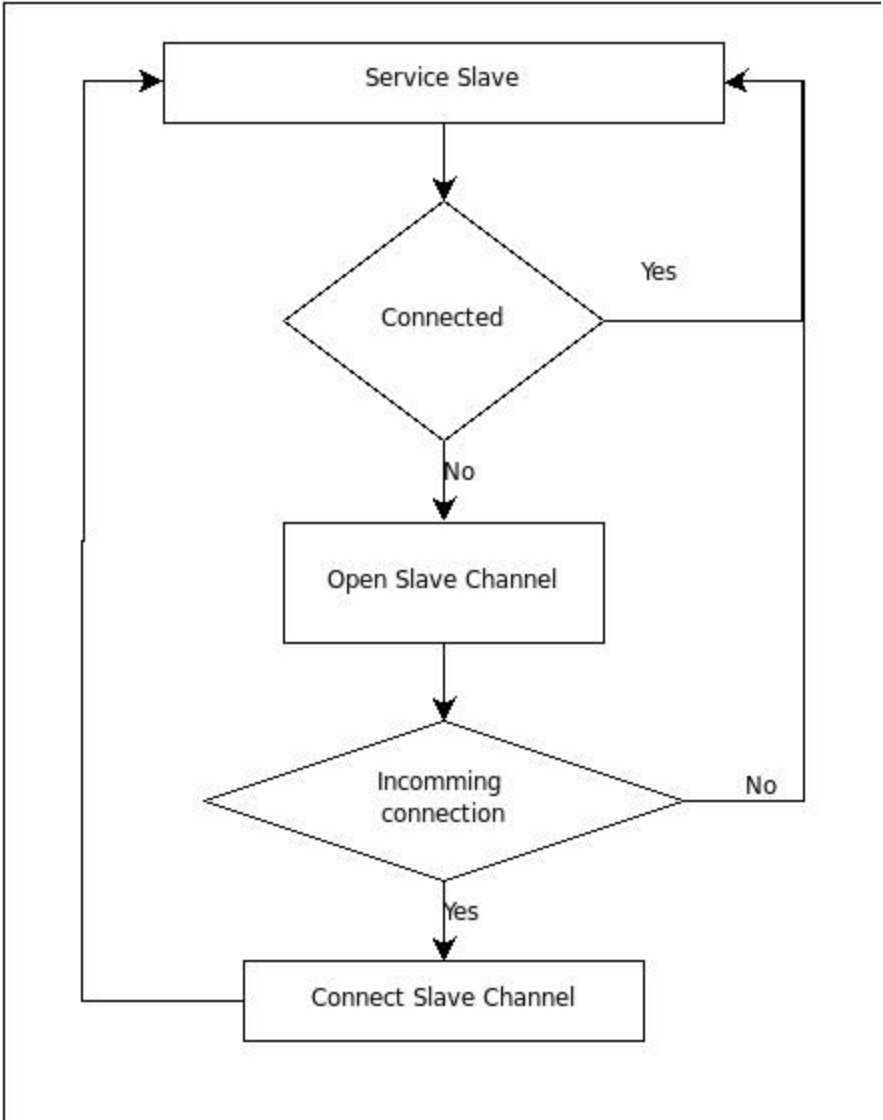
The automatic modes allow or initiate connections without user interaction.

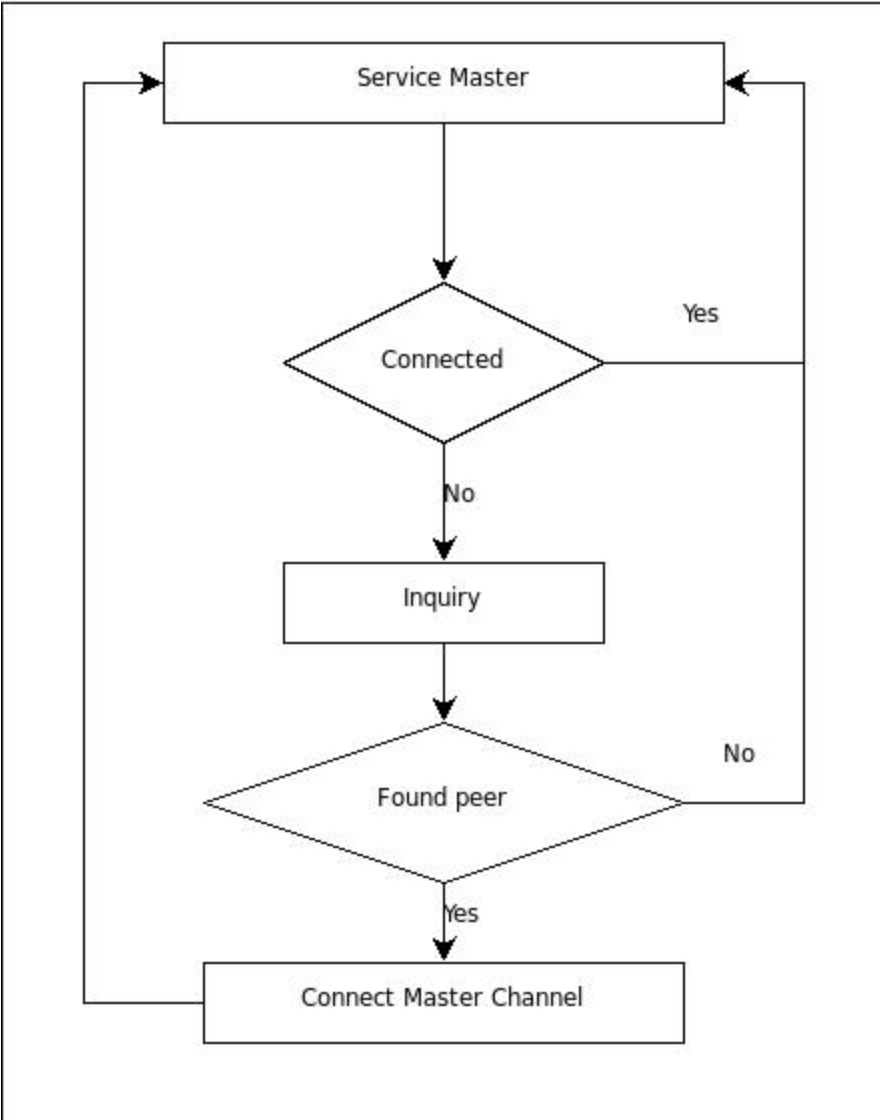
For cable replacement applications, the cable-slave and the cable-master modes are a convenient way to pair two AIRcable OS devices to they make a "wireless cable".

AIRcable OS products support multiple connections at a time, up to 2 SPP and 2 FTP and Obex connections simultaneously.

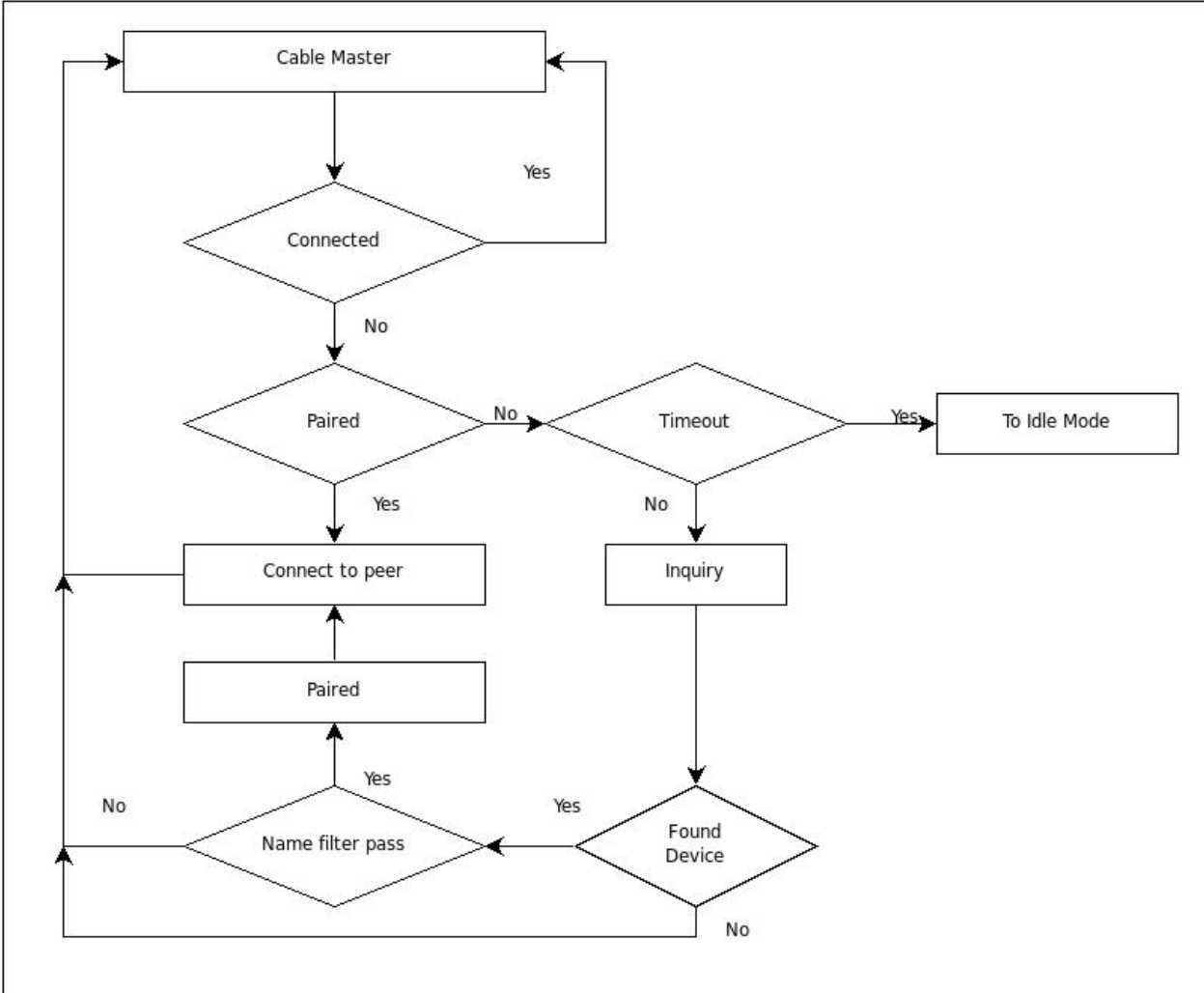
The service modes are used to allow connections from multiple devices (service-slave) or initiate connections to different devices (service-master). A fixed pairing is not needed, though authentication via PIN code is always required. In the master modes, filter can be used to restrict connections to only the devices that are part of a system.

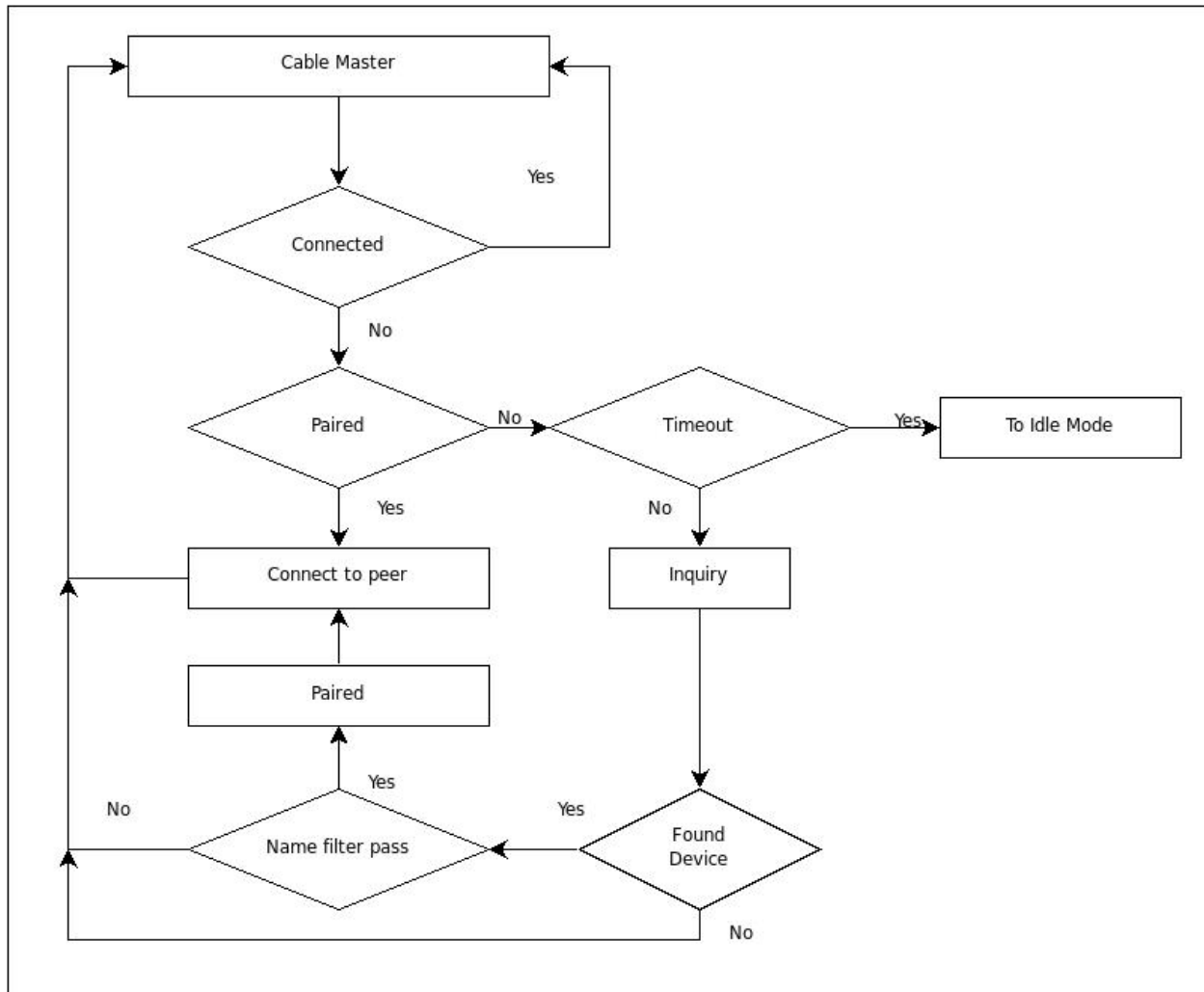
Here are some diagrams that shows how each mode works:











**Relay Mode:**

The 5th mode is the **relay-mode**. One AIRcable will act as a Bluetooth range extender between two other Bluetooth devices, such as a Palm or cell phone and an AIRcable Serial. This bridge will relay data from the Palm to the destination and vice versa. With this combination the AIRcable can extend the range of a Palm, laptop, PocketPC or cell phone to any range required. Multiple relays can be used between the destinations.

This mode is quite special, first of all you will need three modules, at least one of the three must be an AIRcable OS enabled device. In this mode you connect the Master to the Relay, and the Relay to the slave. When both connections are successful established the Master is indirectly connected to the Slave through the relay. So the relay is only a bridge, in case either the slave or the master connection gets closed by anyway, automatically the relay will close the other connection, and will wait for the master to get connected again.

For security reasons the relay needs to pair with its slave, this can only be done from the command line using commands *i* for inquiring and command *j* to pair, once the pairing is successful you exit the command line. Then when ever the relay gets a master connection request, it will link the slave channel to the master channel.

The relay will accept all the connections that it gets from the Master like the service slave does. But you can choose between a Cable Relay and a Service Relay the difference between them will be that the first one will not be always visible while the second will be visible to everyone.

### Changing the Mode:

There are 3 ways to change the mode the AIRcable runs into:

- through the command line, as described above
- with button presses (only on devices that have buttons)
- by uploading a piece of code through ObexFTP.

Each mode can be identified by the LEDs of the module. The AIRcable Industrial and the AIRcable SMD only have one LED, described as the Blue LED.

- *Idle*: Green On, Blue Off.
- *Service Slave*: Green On, Blue fast blinking.
- *Service Master*: Blue On, Green fast blinking.
- *Cable Slave*: Both On Both Off
- *Cable Master*: Once one on and the other off, and the the other way, and so on.
- If a connection has been established both led will turn on

### Using Button to switch modes:

If you have an AIRcable Serial OS with a pairing button, you can use the button to switch between automatic modes. While you are not connected a *short* button press will switch the device from **Master** to **Slave** and from **Slave** to **Master**, preserving the **Service** or **Cable** mode it was running and starting the pairing process again. For example if you were on **Service Slave** it will automatically switch to **Service Master** and will start searching for other bluetooth devices. If you were on **Idle** mode and do a *short* button press you will get immediatly into **Cable Slave** mode.

In case you do a *long* button press, more than 3 seconds, the device will behave a little different. If you were connected, then the module will reboot and will *restart* the mode it was running, that means that it will start the pairing process all over again, for example if you were on **Cable Slave** the device will reboot and will get into **Cable Slave** again but will be **unpaired**. In case you were not connected and you do a *long* button press, the module will reboot and get into idle mode.

Here is a diagram that shows how the device handles button press.

