Fix a dead Paylink

A Paylink unit has a permanent re-programming facility, which is *always* available regardless of the state of the firmware loaded into the unit. The only way this programming facility can cease to work is because the actual central microprocessor has completely failed. This means that if the firmware on a Paylink becomes faulty, you can always re-program it.

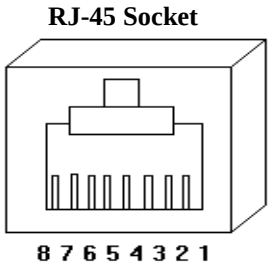
To use this facility you will require:

- A PC with a serial port (or USB lead)
- A special RS232 / RJ45 reprogramming serial cable
- A copy of the Paylink USB reprogramming kernel program as an 'S' record file

The rest of this document details how to load this kernel onto the Paylink unit. This process will erase any problematic loaded firmware, and will leave the Paylink unit waiting for a normal USB download program to be run.

Reprogramming RS232 RJ-45 Serial cable

The "programming" RS232 connection on Aardvark cards is via the RJ-45 connector. This connector will take a "standard" network patch cable used as follows:



RJ-45	Function	Colour
3	Rx	Green/White
4	Tx	Blue
2	GND	Orange
8	Program 1	Brown
7	Program 2	Brown/White

A communications lead for this is can be made by converting a standard network "patch" cable, by cutting it in half and connecting a 9 way D-Type socket (i.e. with holes) to the new end.

To check the wires / colours: holding the lead with plug at the top and the clip at the back and reading from left to right, a "standard" network cable is one that has the colours of the cores going into the plug as follows:

- Orange & White
- Orange
- Green & White
- Blue
- Blue & White
- Green
- Brown & White
- Brown

To connect a 9 way D-Type onto this lead you need to connect:

Core	9 Way Female (PC direct)	9 Way Male (Thru null modem)
Green & White	Pin 2	Pin 3
Blue	Pin 3	Pin 2
Orange	Pin 5	Pin 5
Brown	Connect together **only** during Reprogramming.	Connect together **only** during Reprogramming.
Brown & White		

If you have a (partially) working unit you can test your PC and this cable with a serial program such as PuTTY set up to 9600 8-N-1. Connecting and releasing the reprogramming cores will output at least the line:

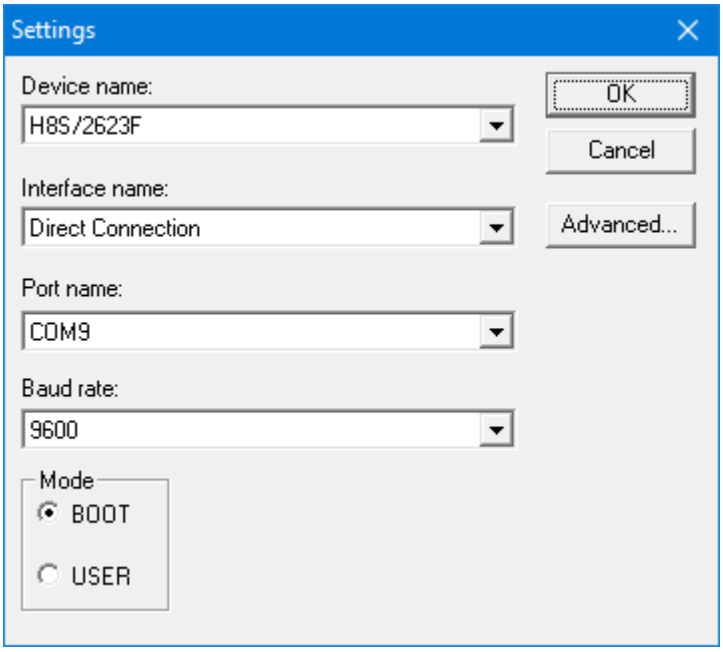
```
Kernel Version: 4.2.2.0
```

Hardware Level Re-programming

This requires a copy of the kernel as an 'S' record file and the Hitachi Flash programming utility, FlashSimple, from here. This is an *unofficial* copy so please do not circulate this.

Running FlashSimple
Before you can use the Program button Flash Simple must be setup. After installation, run FlashSimple and:

1. Goto Flash | Settings



2. Set the device to H8S/2623F and Interface name to Direct Connection.
   Set the Port Name appropriately
   Set the Baud rate to 9600
   Set the Mode to Boot
   Click OK

3. Use the browse button to select the Kernel.mot from the download.

4. Plug in the serial lead and with the Brown and the Brown & White leads connected together it will switch the Paylink unit into hardware reprogramming mode. Connect the other end to the communications port you chose above. Obviously the Paylink unit needs a USB connection but only to power it.

5. Then just click the big "Program" button that occupies most of the FlashSimple window, and wait until it starts to read back the image. At this point, a bug in the FlashSimple program often causes it to start reporting multiple programming errors, if it does you can just click the terminate button.

6. Remove the re-programming lead and the unit should start to run.

If there is any sort of problem with process, you have to remove the lead and plug it in again to reset the Paylink unit, not just retry.

Using PuTTY with the lead.

PuTTY is a general purpose communications program. You can download an installation from: https://the.earth.li/~sgtatham/putty/latest/w32/putty-0.80-installer.msi

Choose the Serial connection type, and type in the communications port and 9600 as the speed, then click open.