# CIV Icom-CAT Interface Router

## Firmware

CIV-FIRMWARE

The firmware was written with the CV-AVR compiler from hpinfotech.ro. If necessary, it can be easily implemented on GNU C or others.

## Function description:

### Reception:

The uC ATxmega128A3-AU has 7 serial interfaces. These are all received via interrupt and the data is placed in a small receive buffer.

The main loop fetches the data from this receive buffer and searches for valid CIV data blocks, which can be recognized by a start of 0xFE, 0xFE and an end of 0xFD. If a data block was found, the CIV data are taken and placed in a FIFO (ring buffer). The green LED is switched on for approx. 1 s.

### Send:

as soon as there are CIV data in the FIFO, they are removed, added to a complete CIV data block and an additional identifier byte placed in front. This additional byte enables the detection of whether the data block was sent out by this router. Since CIV is a bidirectional single-wire interface, you always receive your own transmission, so it is important to know whether the received data comes from you, otherwise you would build an endless loop.

### Routing:

Since all devices are connected to a single wire with CIV, the risk of data collisions is very high. Unfortunately, ICOM has dispensed with a checksum, which is why collision avoidance is at the top of the list.

This router has the advantage of reducing the data traffic, since each device has its own CIV interface. For this purpose, data is only sent to where it is addressed.

After switching on, all data is sent everywhere. However, the router monitors the CIV addresses of the connected devices. As soon as the router knows for sure which device is connected where, it only sends there CIV data blocks that are also intended for this device. This significantly reduces the data traffic and the risk of collision is almost zero.

**LEDs:**

```
red ... the router is sending CIV data to a connected device
green ... the router is receiving CIV data from a connected device
yellow (red + green) ... both receive and send
```

**RS232:**

There is also an RS-232 interface on the board which is protected by an optocoupler. This interface does NOT go through the uC, it is simply looped through directly. However, the uC monitors the data traffic and switches on the red and / or green LED as soon as data is flowing.

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