Supplementary material

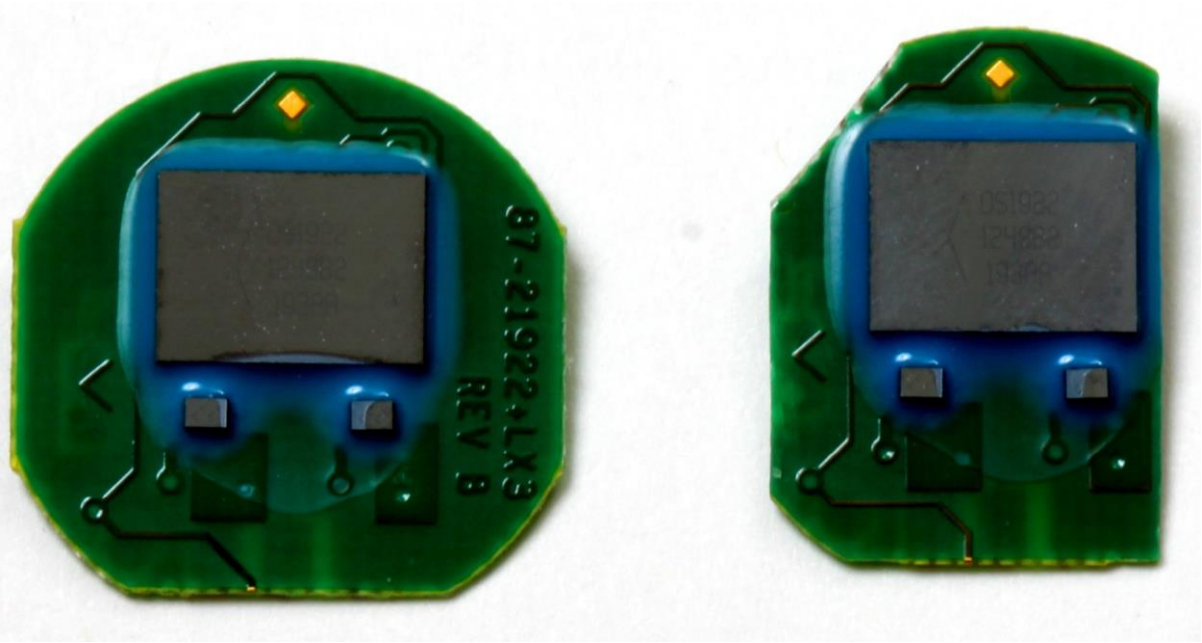

Figure S1. The reverse side of the circuit board both before cutting (left) and after cutting (right).

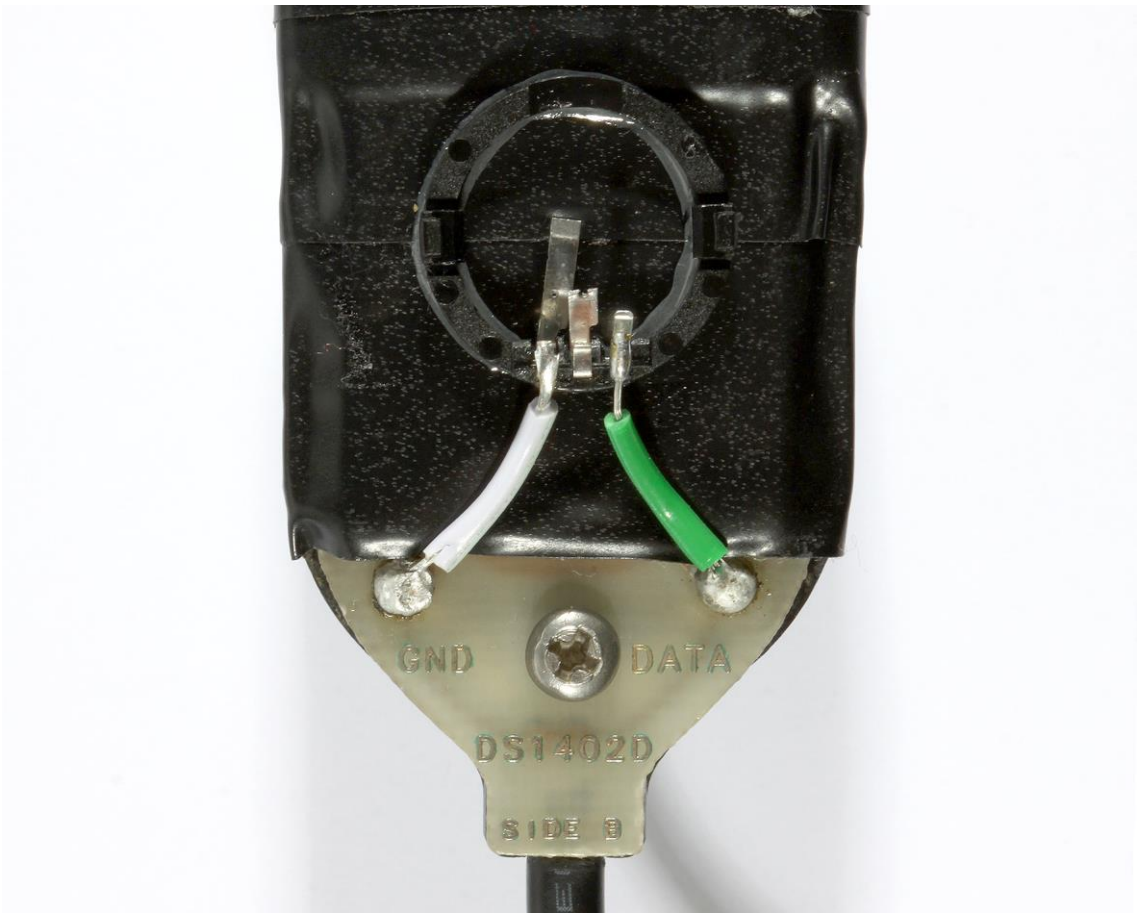

Figure S2. A receptor used to communicate with our devices constructed from a plastic grommet removed from a DSL1922L iButton, soldered to a DS1402D Blue Dot™ Receptor (Maxim Integrated)

Table S1. Mean metrics of different configurations of DS1922L iButtons, including the smallest configuration reported prior to this method (iBconv2). Data for the iBconv2 and iBBat taken from Lovegrove (2009). Minimal mass for vertebrate species is calculated on the assumption that the devices weigh no more than 5% of the animal's body mass

Configuration	*n*	Mass (g)	Height (mm)	Length/diameter (mm)	Minimum vertebrate mass (g)
iButton (DS1922L)	10	2.945	8.74	18.76	72.5
iBconv2	6	1.152	6.78	16.87	29.8
iBBat	6	1.382	8.33	18.33	35.4
Our device (no coating)	10	0.331	2.47	13.86	6.6
Our device (with silicone coating)	10	0.338	2.48	13.87	6.7

Table S2. Common errors encountered when attempting to interface the miniaturised Thermochron iButtons with a computer, and some potential solutions.

Error	**Cause**	**Solution**
Unrealistic temperature readings (common spurious values are 86°C or -41°C); temperature readings not stable at temperatures below 10°C	Low battery voltage	Charge or replace the battery
After activating mission, no mission is active and real-time clock is not synchronised when reading device	A connection has been made between the terminals (e.g. from exposure to moisture)	Check the insulation of terminals
Error message "Cannot read canister"	Poor connection to the reading device	Establish better connection; ensure battery is well soldered to the terminals
Error message "Device not recognised by OneWire viewer"	Battery completely discharged or poor connection between battery and terminals	Charge or replace battery; check for good connections between battery and terminals
Error message "Unable to start mission"	Unknown – possibly poor connection but not confirmed	Disconnect and try again