The development of the HeatBox

**(Bild: 01 Vfd Very First Development) (zeigt alle Stadien )**

Oben: First try, installed on a stripboard (rechts) with an Ardurio-Mini 328 next to an display

Unten: Also installed on a stripboard: improvement, based on the first try next to an external CPU-circuit board with an Atmel 328P installed (links)

**(Bild: 02 v09 HeatBox\_v0.9-beta (1))**

Development of the Beta-Version of the circuit board v0.9, which was delivered as Kit, customers had to solder on some parts themselves.

**(Bild: 03 mit Display HeatBox-NG\_First\_Beta(2015))**

The display too had to be connected manually by the customer by soldering the broadband cable

**(Bild: 04 Gruene Platine HeatBox-NG\_Second\_Beta(2015)(2) )**

**(Bild: 05 gruene Platine Display HeatBox-NG\_Second\_Beta(2015)(1))**

**(Bild: 06 Größenvergleich 1) / (Bild: 07 Größenvergleich 2) / (Bild: 08 HeatBox\_v0.9-beta (2))**

Size comparison

**(Bild: 09 HeatBox\_v0.9beta)**

Built-in circuit board

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**(Bild: 10 Rote Platine HeatBox\_PCB-v1.0)**

First official Roll-out (v1.0) on red circuit-board.

Version 1.0 and 1.1 could be extended by an additive circuit-board for the “Extension Port” to realise a detection for external power supply system and corresponding measurement as well as controls for additional fan for better convective flow of heat.

**(Bild: 11 Mustereinbau\_ v1.0 (1)) / (Bild: 12 Mustereinbau\_ v1.0 (2))**

Prototype installation of HeatBox v1.0

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**(Bild: 13 v1.21)**

From Hardware-revision v1.21 the components of Extension Port were built-in the Mainboard and inherent part of basic function. Therefor the mainboard was enlarged a little to provide space for additional necessary parts and circuit points.

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**(Bild: 14 Heatbox v1.50 –compact)**

After v1.21 mainly the design was optimized, which led to v 1.50 “compact”. All versions older than 1.50 are now recorded as “Legacy”.

The compact series is distinguished mainly by it´s mainboard´s small size, which doesn´t overlap the display – not even the two-lined 2x16 character display.

**(Bild: 15 hb-COMPACT\_Adapter für v 1.51 (3) / (Bild: 16 hb-COMPACT\_Adapter für v 1.51 (4)) /**

**(Bild: 17 hb-COMPACT\_Adapter für v 1.51 (5))**

For costumers, who prefer the four-lined 4x16 LCD, we´re offering the adapter board, which enables, likewise the 2x16 LCD, to realize the sandwich architecture, to economize wiring.

**(Bild: 18 HB\_COMPACT\_2x16\_v151\_c24\_)**

With v1.51 came an optional Version, the “c24”, for running the HeatBox with 11-24 V. All former Versions only were compatible with 11-14,9 V supply voltage.

**(Bild: 19 HeatBox\_v1.60\_12-24v)**

Since v1.60 the HeatBox was designed to deal with supply voltage from 10,8V to 29V.

**(Bild: 20 HB\_v170\_mit\_Verpolungsschutz)**

Along with v1.70 came for the first time, on a similar sized mainboard, reverse battery protection and even more efficient power amplifier, wherefore even voltage reversal could not harm the power supply.

To reduce the installing work for the customer to a minimum, in this stadium of development ready-made cable sets are provided, so even a lay person in terms of electronical knowledge can easily assemble a HeatBox to a complete heating case.