

Heißes Eisen: Discovering the Properties of a Soldering-Iron Tip and Building a Matching Soldering Station

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Abstract

Professional Soldering Stations impose a high financial burden for electronics hobbyists. Some Commercial Tips with integrated heating- and thermal-elements use connectors that can be used with standard sockets. Heißes Eisen describes the process of discovering the thermal-element parameters and the build process of a temperature-controlled soldering station.

Part I

Soldering-Iron Tip

1. mechanical tip properties
2. thermal element
 - 2.1. common element types
 - 2.2. custom measument amplifier
3. heating element

Part II

Soldering Station

4. system overview

4.1. UI

Functional Requirements

- Show the real and control temperature of the tip.

- Allow an arbitrary change of temperature by interaction with a single UI element.
- Provide (with additional systems) the ability to monitor the system and set control parameters.

Interface Components

- Rotary encoder.
- 7-Segment display.
- Serial (USB) debug line.

5. temperature control

6. performance evaluation