

HW Report

Electronics Projects 1: Cable-Monitor

# Abstract

Developing a new device is a fascinating and challenging task. This article gives the reasons why and how this has to be documented.

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# Purpose of the HW Report

Documenting the new device for manufacturing and quality checks.

In case of problems, it is very valuable to know what has been tested and why.

For further development, variants of solutions could be interesting.

If documented the same work has not to be done again, saving time and money.

New team members take over the project.

**The HW report must be updated continuously as the project evolves!**

# Subject and Audience

The subject is the final Cable-Monitor prototype AND the development process.

Before starting to write, the audience should be considered and defined. A report is useless if it is incomprehensible to the intended reader. For the Cable-Monitor an audience with technical background can be assumed. The report should be written such that no particular knowledge on involved technologies and on the Cable-Monitor project is necessary. A good approach is to have an electrical engineering student in mind who has never heard of the Cable-Monitor.

# Abstract

The abstract is a means of advertising one’s work. Online search databases usually only contain the abstracts.

After skimming an abstract, the reader decides if the content seems relevant or not.

The abstract is a concise and short description of the complete work. The content is thus similar to that of the report and includes

* Motivation for and context of the project
* Problem statement
* Solution approach
* Achieved results

The abstract is formatted as one single paragraph. It is a third to a half page long. Shorter is better, as long as the essential information is included.

# Proposed Content

* Title page with authors, date, company, etc.
* Abstract
* Table of contents
* Introduction  
  with subject, circumstances, conditions, expectations, ...
* Specifications, functionality and block diagrams  
  Aspects may be purpose, primary (and secondary) functions, parameters (ranges, limits), interfaces, HW and SW requirements, user interface, time, cost, ...

This must be well defined before the development starts!

* Evaluation of different solution possibilities  
  Summarize each possibility in terms of the specifications and the functionality.  
  Extract what is specific to each solution.  
  Justify and explain the decision for a particular solution.
* Development  
  Document circuit design, formulas, simulation, dimensioning of component values.
* Implementation  
  Schematics with description of inputs, outputs, special components  
  PCB layout with explanation of the layout concepts (analog, digital, power, EMI, ESD)
* Document the tests  
  Testplan with description, test conditions, expected results and acceptable tolerances, measured results, comparison and verdict, discussion and remarks  
  More about testing is in the file **HW\_ Testing.docx**.
* Project management  
  Timeline with milestones  
  Definition of work packages and assignment to team members  
  Comparison of planned and real workload
* Conclusion  
  Achieved results  
  Outlook and reflection
* Appendix with  
  References or bibliography  
  Schematics, PCB layouts, calculations, tables with test data, code snippets  
  Folder structure with explanation for digital documentation on USB stick or cloud.  
  **The appendix contains all the information that is not needed for fluent reading.  
  As a rule, diagrams go in the main text, data tables in the appendix**.

# Academic Writing

Form and style of the HW report must follow the customary practice for academic writing as presented in the file **Academic Writing\_summary.docx** in the folder **Writing HW Report**.

Read that summary carefully before starting to write and read it again after writing a first draft.