



# Template SchematicDiagrams.pdf

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## Abstract

The schematic diagram document is used to document your self designed electronics/PCBs involved in the Emergency Brake System (EBS). These are typically some hard wired logic and a supervising CPU. If the supervisor is a bought part like e.g. a dSPACE box, it is also used to document the pin connections of bought parts and hard wired logic.

## 1 Document Requirements

Provide schematic prints of your EBS electronic. It must include the following points:

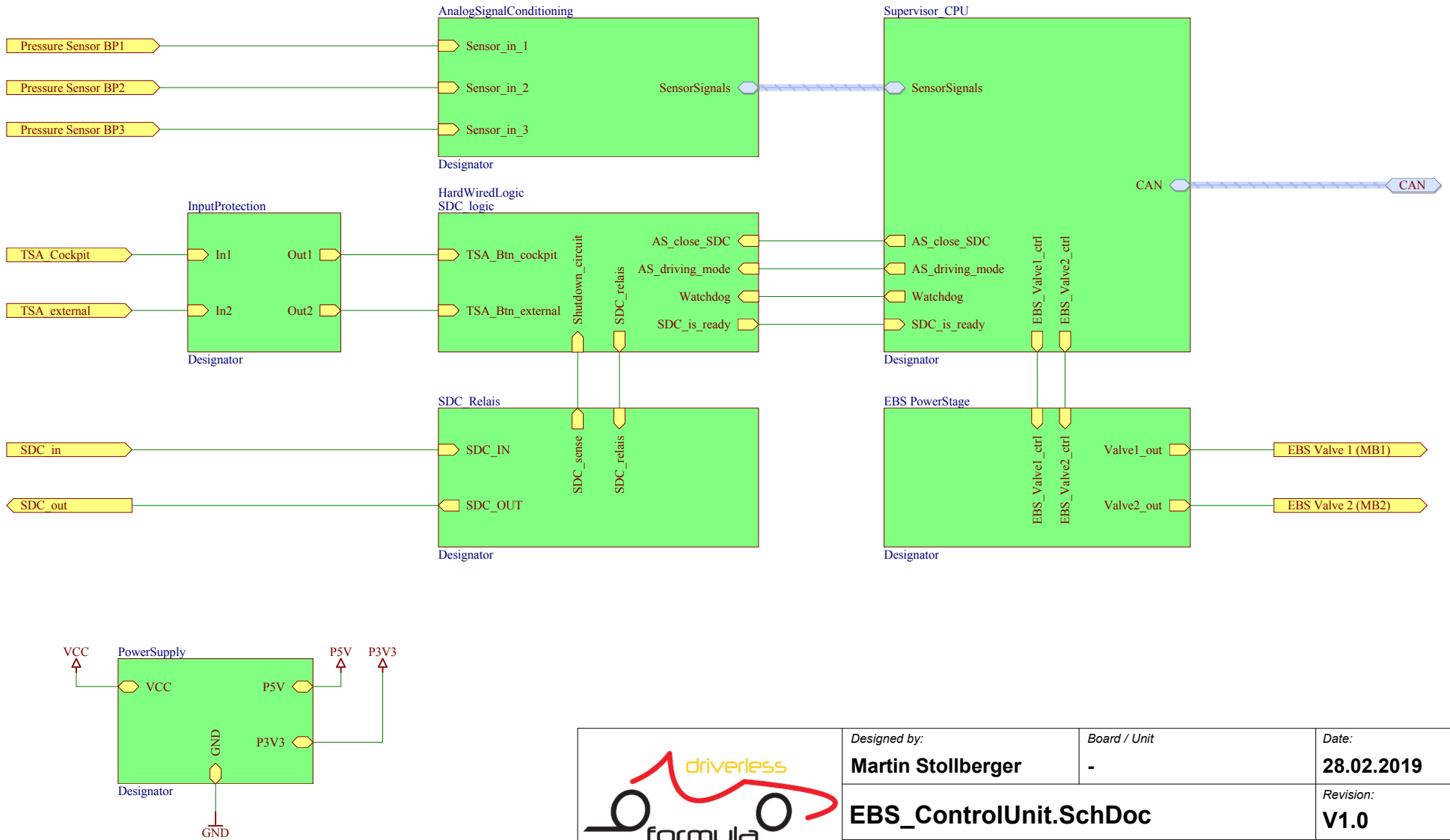
- All ports of the abstracted EBS-electronics block of the wiring diagram.
- The hard wired logic required by the rules.
- The supervising CPU.
- If you use an external CPU like dSPACE for monitoring, it must be clearly shown how it is connected, including exact naming of the ECU pin.
- If you use bought processor boards like for instance the xNucleo, the schematics of this board must not be included. But the exact type and pinning of the board must be shown in the schematic.
- All power stages used to drive the EBS actuators/valves.

To enable us an efficient review and provide you with a proper documentation, please also take care of the following points:

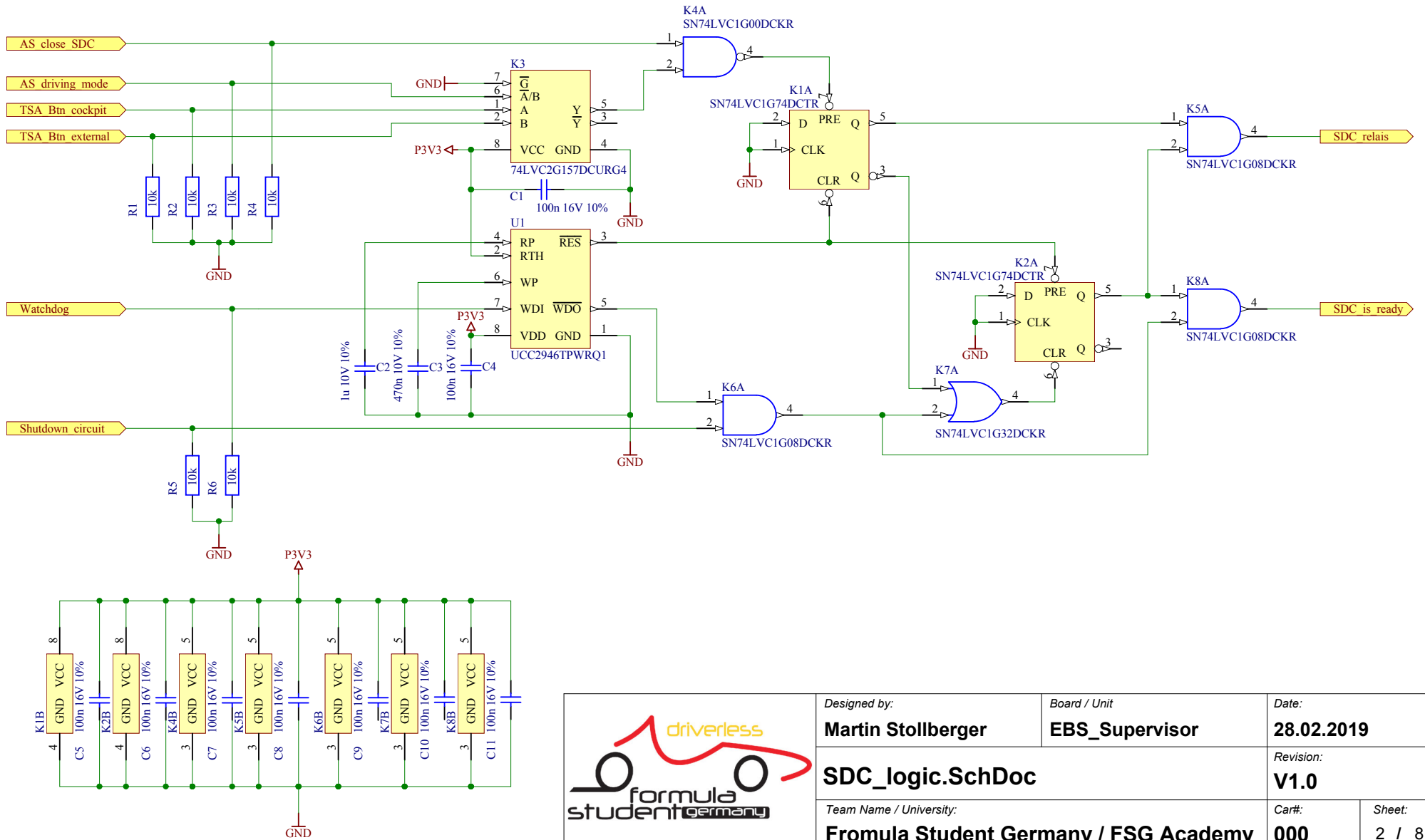
- Use hierarchical design and start with an overview page.
- Name/label every sheet uniquely for cross-referencing to the higher level hierarchy blocks.
- Clearly label board names on the schematics, if more than one PCB is used.
- Show all external ports from the wiring diagram on the top level page.
- Clearly structure your schematics: signal flow when ever possible left -> right.
- Use symbols with split power supply for logic gates whenever possible.

## 2 Example

**Warning:** The following example shows only how the document could look like and what is meant by the different checklist points. The technical content is not necessarily compliant to the rules nor necessarily related to the other documents nor function at all.



Designed by: <b>Martin Stollberger</b>	Board / Unit -	Date: <b>28.02.2019</b>
<b>EBS_ControlUnit.SchDoc</b>		Revision: <b>V1.0</b>
Team Name / University: <b>Formula Student Germany / FSG Academy</b>	Car#: <b>000</b>	Sheet: <b>1 / 8</b>



Designed by: <b>Martin Stollberger</b>	Board / Unit <b>EBS_Supervisor</b>	Date: <b>28.02.2019</b>
<b>SDC_logic.SchDoc</b>		Revision: <b>V1.0</b>
Team Name / University: <b>Formula Student Germany / FSG Academy</b>		Car#: <b>000</b>
		Sheet: <b>2 / 8</b>



### 3 Document Checklist

The following checklist will give you an overview of the points which mandatorily have to be fulfilled to get an approval. This checklist will also be used during the review process. But the the review is not only limited to this list. We will check additional points as well.

#### GENERAL REQUIREMENTS

- |  |  |
|--|--|
| 1 <input type="radio"/> Document is printable in DIN A4.                               | 4 <input type="radio"/> Relevant text is embedded as text and not as picture (search-able).    |
| 2 <input type="radio"/> Team name, University, Car# is written on every page.          | 5 <input type="radio"/> Document name is written on every page.                                |
| 3 <input type="radio"/> Pictures well sized and in good resolution (vector or 300dpi). | 6 <input type="radio"/> All Pages are numbered, including total number of pages e.g. Page 1/5. |

#### SPECIFIC REQUIREMENTS

- |  |   |
|--|---|
| 7 <input type="radio"/> All ports of the abstracted EBS-electronics block of the wiring diagram included.      | 13 <input type="radio"/> Hierarchical design is used and first page is the top-level overview page.                                 |
| 8 <input type="radio"/> The hard wired logic required by the rules included.                                   | 14 <input type="radio"/> Alls sheets named/labeled uniquely and are properly cross-referenced to the higher level hierarchy blocks. |
| 9 <input type="radio"/> The supervising CPU include.   | 15 <input type="radio"/> All sheets are labeled with board name if more than one PCB is used.                                       |
| 10 <input type="radio"/> Pinning external CPU like dSPACE shown.   | 16 <input type="radio"/> All external ports from the wiring diagram are shown on the top level page.                                |
| 11 <input type="radio"/> Schematics of bought processor boards excluded, but the exact type and pinning shown. | 17 <input type="radio"/> All schematics are clearly structured and neatly formatted.  |
| 12 <input type="radio"/> All power stages used to drive the EBS actuators/valves included.                     |   |

### Changelog

V1.0: Initial Version.