Design Documentation

Measuring process of LEM sensors

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# History of Changes

The changes were inscribed from the first approved version (1.0.0). Before a change is inscribed, the version number of the document has to be inscribed.

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| Number | Page / Chapter | Description | Date | Name |
| 1 |  | Version 1.0.0 prepared |  |  |
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# Introduction

This document is a manual to show how to perform measurements for current sensors. It addresses oneself to bfh technicians who will perform future measurements.

## Terms, Definitions und Abbreviation

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| Abbr. | Description |
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## Related Documents

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# Global project description

## Introduction

LEM wants to test several of their current sensors in order to determine their behaviour under realistic conditions as they happen in an electric vehicle. This means that not only a constant current is applied to the sensors, but a complete current-over-time profile. One main purpose of the current sensors is the calculation of the SoC of the battery. For this, there is a small tolerance of offset current, because already small errors will accumulate to big charge differences, biasing SoC calculation. Because of this, the main output of these measurements is the Charge difference between the device under test and a reference sensor.

## System Overview

The following parts are taken from the document “2014-02-21 Technical Proposal\_1.4.docx”, which described the measuring process in the first place.

R

PCMCIA

Agilent 34972A multimeter

Ethernet

CAN output

PWM output

Ethernet

Evaluator-B

Test bench

0..5V

0..600A

Temperature chamber

NI Series 2

LeCroy oscilloscope

Analogue voltage output

Laptop

with LabVIEW

HMI

DC

Analogue

current

output

USB

LIN output

NI USB-9866

Figure 1 System Overview

Basically, the system consists of one reference sensor and one or more devices under test, the Fuelcon test bench to generate the current profile and a laptop together with measurement equipment to get the results.

In order to use the Fuelcon test bench, a dummy battery has to be installed to generate the necessary minimum voltage higher than 1V. For this, a specially assembled battery block has been made, which can be reused.

If the sensor has to be tested under different temperatures, a thermal chamber can be used. In this case, the device under test is put into the temperature chamber, while the reference sensor is kept outside it. This assures that the temperature drift of the reference sensor is kept minimal.

# Setup procedure

## Introduction

This chapter proposes the necessary steps in the case that a new sensor provided by LEM will be tested. It tries to list the issues and pitfalls that occurred during the test of the first sensor (the CAB 300-C)

## Hardware installations

### Install new sensor under test

### Install reference sensor

### Install dummy battery

### Cabling

### Measurement for Fuelcon test stand

## Software steps

### Generate xml file from csv file

### New LabVIEW code for sensor under test

### Testworks adaptations