PV-Research-, Test- and Demo PV Power Plant “Karl-Näf-Stiftung”

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The PV laboratory of the Bern University of Applied Sciences (BUAS) in Burgdorf installed a new PV power station for the purpose of research, test and demonstration. Because it has been mainly funded by the “Karl-Näf-Stiftung” it is called PV-Research-, Test- and Demonstration Power Plant “Karl-Näf-Stiftung”. It is the first PV plant on an inclined roof at BUAS in Burgdorf and features four PV arrays with different technologies with about 6 kWp each and 25.2 kWp in total. With this installation we will do research on topics like: module degradation, module temperature, snow behavior, EMC-measurements and comparison tests.

Introduction

The shed on the ground of BUAS in Burgdorf is perfectly suited for a PV installation. It has an east-west oriented roof with 10° inclination. The surface used for PV is oriented to south-east with -29° azimuth and has a surface of around 150m². The PV array is divided into four surfaces with different types of PV modules.

Module types				
Type	**Cell technology**	**Power [Wp]**	**Module efficiency**	**Array power [kWp]**
JA Solar Mono JAM 60S10-330/PR Halfcut	monocristalline	330	19.6%	6.6
JA Solar Poly JAP60S01-275/SC	polycristalline	275	16.8%	5.5
Sharp NU-AK310	monocristalline	310	19.1%	6.2
LG345N1C-V5	monocristalline	345	20.1%	6.9

Wiring and substructure

Each of the four arrays consists of two strings. All but the red array will be wired as monofilar, while on the red array we will test the impact of bifilar wiring. The arrays on the left side are mounted with a insertion system, while the right side is mounted with a clamping system.

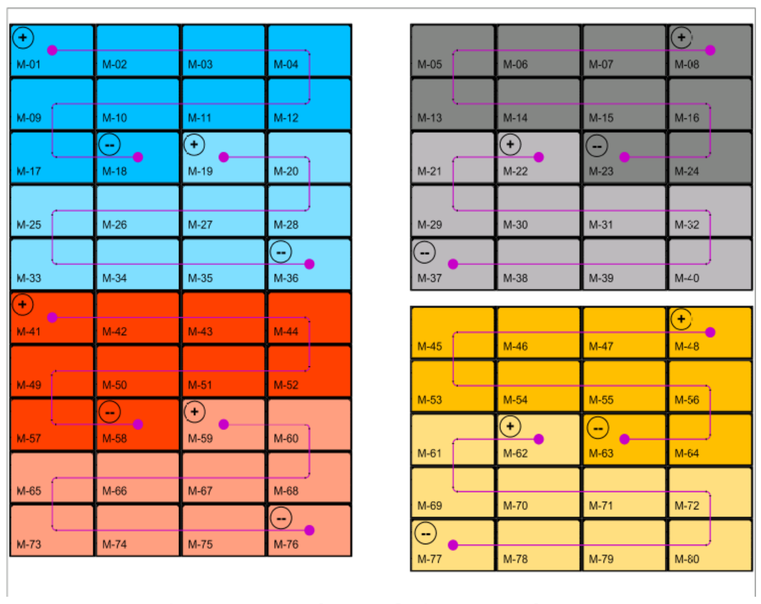

Figure 1: The stringplan of the PV plant.

Figure 2: The PV Plant under construction.

Inverters

The assembly of the inverters is organized as such, that different inverters can be tested on site using different numbers of strings. The PV Lab also plans to test inverters with integrated arc detectors on the PV plant. Currently, we use a Fronius Symo 8.2.3 with two strings and a Huawei SUN2000-23KTL with 6 strings connected.

Figure 3: Assembly of the inverters.

Outlook

The PV plant will produce around 25’000 kWh per year at a cost of around 6 Rp./kWh.

We will be monitoring temperatures of the fields and compare the effect of the different mounting systems.
Several PV components will be tested on site.

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