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## Prüfbericht Test Certificate

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<b>Prüfgegenstand // Object:</b>	Measurement of temperature behaviour of All Sky Imager ASI-16.
<b>Auftraggeber // Customer:</b>	CMS Ing. Dr. Schreder GmbH Lofererstraße 32, A-6322 Kirnbichl AUSTRIA
<b>Hersteller // Manufacturer:</b>	CMS Ing. Dr. Schreder GmbH
<b>Typ // Type:</b>	ASI-16
<b>Seriennummer // Serial number:</b>	16015
<b>Datum // Date:</b>	13. June 2016 - 15. June 2016
<b>Seitenanzahl // Number of pages:</b>	3

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**Siegel // Seal**

**Ausstellungsdatum // Date**

**Für den technischen Inhalt verantwortlich  
//Responsible regarding technical content**

19. June 2016

Ing. Dr. Josef Schreder

**Prüfgegenstand // Description of the calibration object:**

Test of a All Sky imager ASI-16 inside climate chamber. The System was connected by TCP/IP standard cable and the original power supply. It was horizontally levelled inside the test chamber. The temperature is shown on the Measurement Chamber

**Ort der Prüfung // Pace of certification:**

CMS Ing. Dr. Schreder GmbH Lofererstraße 32, A-6322 Kirchbichl.

**Umgebungsbedingung // Environment:**

The Test was carried out under environmental conditions.

**Kennzeichnung // Identification:**

The system is identified by its serial number.

**Messaufgabe // Task of measurement:**

Measurement of temperature behaviour.

**Verwendete Messgeräte // Used instruments:**

Climate Chamber Heraeus-Vötsch, VLK 04/150  
Infrared thermometer TV325.

**Verwendete Unterlagen // Used documents:**

- **Interne Arbeitsvorschrift:** carried out according to internal procedure, as applicable.

**Bemerkung // Remark:**

The documented results correspond exclusively to the stated instrument. A dependence of other influence parameters than the described one are not investigated.

## MESSUNG/MEASUREMENT

### Beschreibung/Description

The All Sky Imager (ASI) was put into the test chamber. ASI was on operational mode before starting cooling down the environment. Test cycles were started on day 20160613 at an environmental temperature  $T_{ENV}$  of +21°C. Lowest temperature of the test cycle was set to -40°C, highest temperature was set to +56°C. The device under test was running under operational modus (2 image @ 5 minutes) for about 45 hours.

Temperatures were logged with the ASI internal temperature sensor and an external temperature sensor ( $T_{EXT}$ ). The  $T_{EXT}$  was put in a distance of about 8cm above the glass dome of the ASI. The  $T_{EXT}$  showed a temperature which was about +6 °C higher than the ASI temperature sensor. This temperature difference is the effect of the internal heating system of the ASI.

On day 20160613 the device under test was running under standard operation modus. Environmental temperature  $T_{ENV}$  was set at levels +21°C, +16°C, -10°C, -30°C, -40°C. The internal heating system of the device under test was running (electrical heating with about 60W). At 18:00 ( $T_{ENV}$  = -30°C) the heating system was switched off (not standard operation) to test the coldest environmental situation. ASI was running as required.

On day 20160614 the device under test was running under not standard operation modus (the internal heating system of the ASI was switched off). The internal heating system of the device under test was switched off. The  $T_{ENV}$  was set to -40°C since day 20160613. At 08:00 the power of the system was switched off to test the restart behaviour. After 4 hours at 12:00 power was switched on again. The ASI started and was working as required. At 16:15 the environmental temperature was set to +56°C. In

In addition the external ASI housing temperature was measured with an infrared thermometer (+56°C). ASI was running as required.

On day 20160615 the device under test was running under not standard operation modus (the internal heating system of the ASI was switched off). The environmental temperature was set to +56°C since day 20160615. ASI was running as required.

## Ergebnis/Result

The All Sky Imager was successfully tested for standard operation modus under "Extended Temperature Range" between -40°C to +56°C, with a measurement and climate chamber control tolerance of  $\pm 3$  °C. Restart of the ASI was carried out with deactivated internal heating system at lowest environmental temperature. The system was running under all tested environmental situations without troubles. The temperature measurements are presented in the plots below.

