

HILTRON De-icing Control Unit HDCU-E (extended) Antenna De-icing System

A combined de-icing sensor and dish heating system for direct control for big satellite antenna dishes; the design of the system is based on the design for small and medium antennas and is enhanced to cover the required high power demand for the high number of heaters for big satellite antenna dishes.

Features

- Supply 3-phase operation with 400 VAC
- Three individual circuits (phases) for heater control to connect up to three pads per circuit for Sub-reflector
- One individual circuit for feed heater control (240 VAC)
- With four additional heater groups consisting each of 3 heater array each with 3 heater circuits in total 36 heater circuits (pads or pads groups) can be controlled
- With four heater groups in total 12 arrays can be controlled separately
- Heater current control and protection.
- Controlled switch-on and switch-off of heater pads.
- Nom. measurement range 20 A.
- Processor controlled de-icing control with four sensors
- Ethernet interface for M&C
- RS485 interface for hand terminal operation
- Web based user friendly operator interface
- Control via SNMP

Options

- optional logical control in- and outputs for manual remote operation

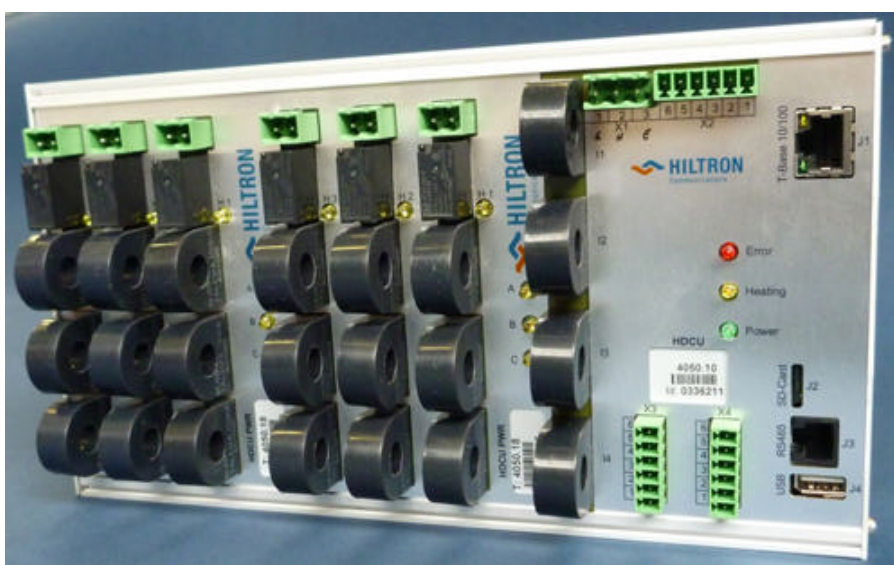


Fig 1: HDCU-E – View on control module (used for medium und small antenna dishes)

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Description:

The Hiltron Deicing Control Unit **HDCU-E** is a combined de-icing sensor and heating system controller built up for (in- and) outdoor application. The system is an enhanced design of a standard Hiltron Deicing Control Unit **HDCU** for the control for small and medium satellite antenna. It is designed for big satellite antenna de-icing systems with electric power up to ~ max. 450 kW to be controlled

The Control Unit consists of several heating groups. Each heating group consists of three independently controlled heater arrays. One array is dedicated to the heating supply for one antenna dish segment. Each array supplies three antenna heater circuits. Several heater pads can – if necessary - be grouped to one heating circuit. The permitted current for each heater circuits is max. 20 A. All currents are measured and monitored and evaluated by the control unit. Furthermore the function of each array is controlled on safety reasons by a thermo switch. Any malfunction - too high / too low heater pad current and too high panel temperature - will be detected and indicated by the control unit. The tolerance are of each measured current (heater circuit) is supervised by a settable max. and min. threshold. Thus for each heater circuit the current is controlled individually. This allows to exclude not connected or broken heater pads from the controlling process. In case of a short in an heater circuit the whole array have to be excluded from the controlling process.

The control concept is modular and therefore the number of groups can be tailored to the respective requirements (size of the antenna, number of heater pads, required power for heating etc.). For example an antenna with 12 dish segments a design with 4 heating groups with 3 array is recommended. The heating group “main group” is dedicated for heating of the sub-reflector (with three heating circuits), the feed heater control (with on heating circuit) and further applications (tbd).

In order to prevent high transient currents when the heating process of the antenna is activated the switch-on of the heater arrays is delayed in a timing sequence. (see Fig.: Flow Chart) The switch-on and switch-off sequence of the arrays (heater pads) can be configured and is indicated in the Web-interface.

Ref. to Fig. 2-1: Functional Block diagram

Ref. to Fig. 2-2: Heater Pad Control & Control Concept

All measured temperatures and currents of each heating circuits as mentioned before are monitored. All status messages on the heating circuits and the de-icing process are visible in the Web-interface. This allows a comfortable monitoring and control of the whole system. All parameters and status messages can be controlled via SNMP too.

For the maintenance, monitoring and control there are in total 3 interface

- A LAN interface (connector RJ45) to enable the monitoring and control via Web and/or SNMP.
- An USB interface (connector USB) for maintenance applications (software update, data logging, etc.)
- A RS485 interface (connector RJ11) for future remote control via a remote hand terminal.

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The Hiltron Antenna Deicing Control Unit can be operated manual control mode as well. In manual operation mode the heater function can be switches on or off. The detected currents and temperatures, however, are monitored and available via Web-interface and SNMP. Optional are provided logical control inputs and monitoring outputs (dry relay contact) to control the antenna de-icing remotely straight forward.

Specifications

Electrical	
Power consumption of Control Logic:	AC input: 85-245V; 47-63Hz; Standby power < 4 W
Power capability (3-phase)	n x 40 kW @ 400VAC n = number of groups
Current for 3 common supplied heater circuits	nom. 20 A @ 230 VAC
Sensors	
Temperature sensors	PT 100 (ambient) PT 100 (on antenna) PT 100 (tbd.)
Snow sensor	Reflective Sensor with polarization filter
M&C- Parameters	
heater currents limits (upper and lower threshold)	for all heater circuits
Heater currents safety limits	for all heater circuits
Monitoring of paramters:	Currents, settings, statuses
Control parameters:	thresholds for activation and deactivation of heating, heating delay
M&C - Interfaces	
LAN interface	Ethernet / IEEE802.3 Data transfer rate: 100 Mbit/s Connector: RJ45 Communication: Web / SNMP
USB interface	for maintenance (data logging, software update)
RS485 interface	Type: RS485 Connector: RJ11 Baud rate: tbd.
Control input	form C contacts optional
Monitor output	form C contacts optional

Mechanical / Environmental	
Size:	tbd.
Weight:	tbd.
Temperature:	
- Operating:	-30°C to +50°C
- Non operating:	-40°C to +80°C
Humidity:	
- Operating:	5% to 95% non condensing
- Non operating:	0% to 100% non condensing
Housing:	IP68-11
CE safety	EN60950-1 / UL 60950
CE EMC	EN 55022 Class B
Emissions	EN 61000-3-2, -3
Immunity	EN 50082-1

