

Documentation

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Short technical description of the Genius US control system RTS98002 for Wirsbo Company and Wirsbo of Canada			
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Operational description of the Genius Control System

General

The Genius Control System (hereafter referred to as Genius), is an electronic wireless system intended specifically for controlling room temperatures in buildings where hot-water radiant floor heating installations are used, i.e.; controlling room temperatures by controlling the hot-water flow in each of the sections of the radiant floor heating installation.

The Genius system consists of one control unit with an RF receiver and up to ten dedicated wireless thermostats.

The thermostats monitors the individual room temperatures and for each room compares the actual temperature to a manually chosen set-point temperature; when the actual temperature is below set-point, a low-power transmitter built into the thermostat transmits a digital room ID code and a digital sequence indicating a heat-demand for the room in which the thermostat is placed.

The RF signal from the dedicated thermostat is received and decoded by an RF receiver built into the Control Unit. The decoded signal is interpreted by a micro processor which then activates a motorized valve actuator controlling the hot-water flow to that particular section of the radiant floor heating installation which includes the room whos thermostat transmitted the heat demand signal.

Thereby, an integrating closed loop control system is established with the following main parameters:

- system type: integrating, closed loop
- input parameter: room temperature
- output parameter: hot-water flow

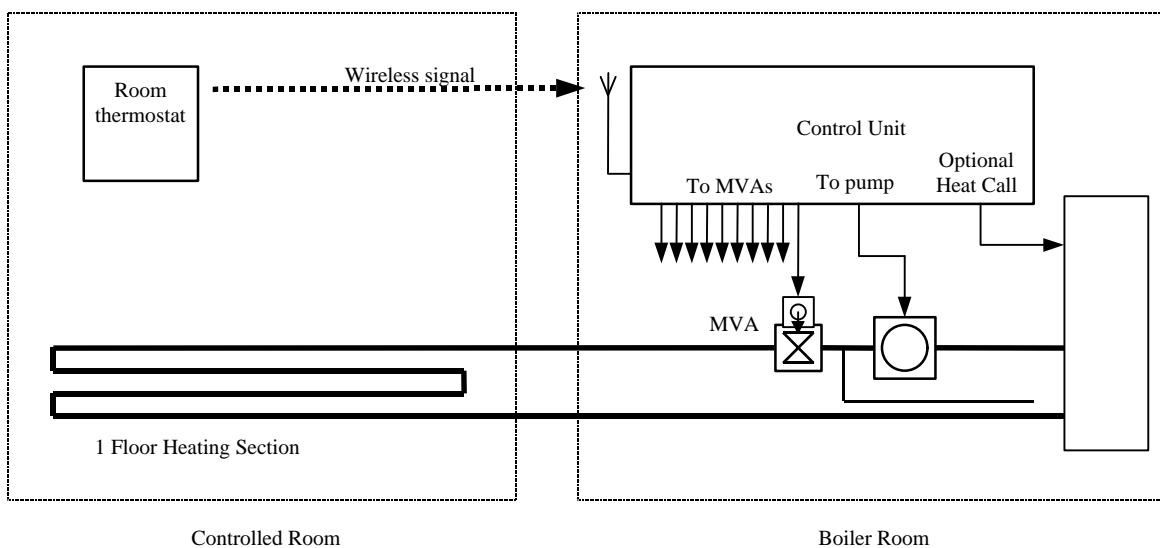


Figure 1: System sketch, 1 of up to 10 sections shown

The room thermostat

The room thermostat is a selfcontained battery powered unit with a number of principal functions:

- Analog temperature measuring circuit
- A/D conversion circuit
- Digital processing circuit
- Digital encoding circuit
- Frequency Shift Key modulation circuit
- RF oscillator & transmitter circuit
- Integral Antenna

Room temperature measurement is performed at a predetermined interval. If the actual measured temperature is below the set-point temperature by a margin of 0,2 degree, a frame is generated and transmitted. This causes the individual transmission to be unscheduled and initiated solely by an arbitrary parameter, complying with the requirements of FCC Part 15.231 ff.

The thermostat is powered by a 3,6 V lithium battery

Figure 2 shows the principal structure of the room thermostat

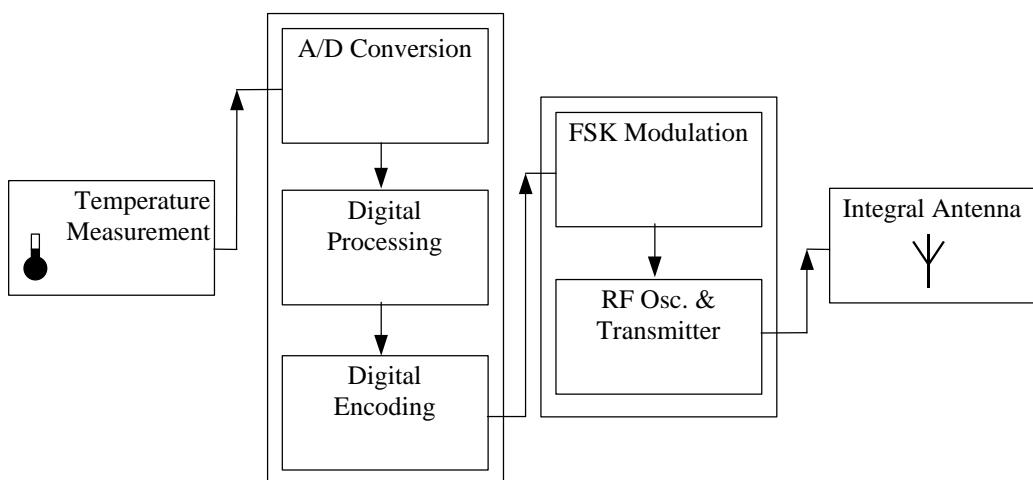


Figure 2: Principal sketch of room thermostat

The thermostat has an LCD display and a multi-function control button with the following features:

- Press button once: Show set-point temperature
- Press button again: Revert to showing actual temperature
- Turn button: Adjust set-point temperature

LCD display automatically reverts to actual temperature after 10 seconds of inactivity on the turning/push button.

The Control Unit

The Control Unit is a multi-function unit with the following principal functional circuits:

- RF receiver
- 1 dedicated external antenna
- Microprocessors
- 10 powered SELV outputs (24 VDC @ 250 ma) for Motorized Valve Actuators
- 1 powered output for pump control (115 VAC)
- 2 auxilliary SELV dry contact output (Heat Demand)
- Linear Power supply
- Supply voltage: 110 Vac +6/-10 %
- Installer Interface:
 - 1 RS232 port accessible to installer for installation of dedicated thermostats
 - 3 push buttons accessible to installer for installation of dedicated thermostats
- User Interface:
 - 11 multicolor LEDs
 - 1 pushbutton accessible to user

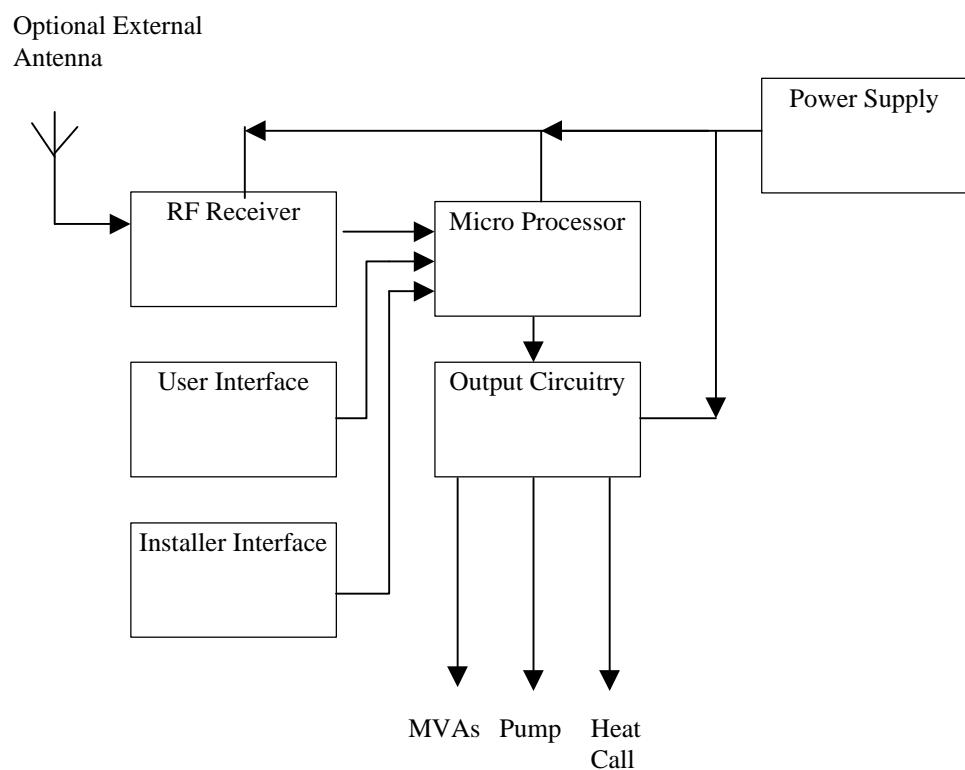


Figure 3: Principal sketch of Contr...