

Operational Description

The K5497 control performs all functions necessary to operate a multi-speed fan and downlight. In addition, it integrates several features that have been discretely packaged inside of a fan control system. The K5497 has audible feedback to announce a received RF Command from a handheld remote.

The K5497 receives its power from the mains power on the fan circuit. This AC power is converted to an auxiliary DC Voltage. Additionally, the DC Voltage is regulated internally inside of the Krankl IC.

The Krankl IC can directly drive the motor control triacs to control the fan motor in multiple speeds. The Krankl IC can also drive a light circuit with dimming functions and short circuit protection.

The primary clock for both the motor/light/RF processing is a single 30 Mhz crystal.

The Krankl IC contains a fully integrated ISM transceiver radio. The receiver uses a weaver architecture for image rejection, primarily to avoid noise imaging. The received signal is amplified by a LNA and sent to a RF mixer to generate I/Q signals at the IF frequency of 795 kHz. This signal is filtered to around 500kHz. After the second frequency conversion, the I and Q signals are filtered to around 150kHz. The frequency generation is accomplished with a PLL locked to the primary crystal. The final signal is digitized using a 12 bit ADC. The digitized bits are stored in an 80 bit buffer.

The transmitter contains a PLL, phase modulator and power amplifier. The maximum power level is +15dBm. The transmitter contains a finite state machine with a group of registers that allow automatic transmission of up to 16 bits. An integral RF Switch is used to share a single antenna between the transmitter and receiver.

RF Specifications

- OOK modulation
- 434.06 Mhz Center Frequency
- 833 bytes/second data rate
- 92.8 ms packet time

A handheld remote in the system is activated manually by the customer. Typically, this happens as a button press. A single packet (or groups of packets) is then sent to the K5497 receiver. The K5497 receiver can then acknowledge that the packet was received by sending a return message back to the transmitter. The acknowledge packet is not always performed as the handheld remote needs to be equipped with a transceiver circuit as well.

The system operates in a typical wireless remote control fashion with no periodic nor automatic transmissions.