SLOVENSKI STANDARD
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Elektronski sistemi za stanovanja in stavbe (HBES) – Tehnično poročilo 5: Zahteve za infrardeče HBES in zahteve trga

Home and Building Electronic Systems (HBES) - Technical Report 5: Application requirements and market demands for infra-red in the context of HBES

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Home and Building Electronic Systems (HBES) Technical Report 5: Application requirements and market demands for infra-red in the context of HBES

This CENELEC Report has been prepared by the Technical Committee CENELEC TC 205, Home and Building electronic Systems (HBES). It was approved by the Technical Committee on 1995-10-18 and endorsed by the CENELEC Technical Board on 1995-11-28.

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CENELEC

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Foreword

This Technical Report has been prepared by Working Group 9 of CENELEC Technical Committee TC 205, Home and Building electronic Systems.

During the TC 205 plenary meeting on 18/19 October 1995 it was decided to ask the CENELEC Technical Board to approve the document for publication as a CENELEC Report. The CENELEC Technical Board approved the document for publication as a CENELEC Report on 1995-11-28.

Introduction

This document describes applications which an IR-system for Home and Building Electronic System, HBES should meet. Market and application demands are taken into account.

As a Technical Report, the document is believed to provide an adequate, but non-limitative set of typical requirements and design recommendations.

1 Requirements

1.1 Application environments

Room based	A living room or a office. Typical not bigger than about 70 m^2. It is part of our work.
Apartment based	An apartment consists of several rooms and eventually its immediate surrounding e.g. a garden entrance. It is part of our work.
Building / campus based	Not required and not suitable for IR applications. Later we could consider point to point communication between building e.g. laser technology.

1.2 General technical requirements

1.2.1 Requirements on room based application

1) Reliable functionality, not disturbed by other systems and natural effects (daylight, FL-lamps, etc.) Comparable to a traditional installation, typical < 3 missing actions.
2) Fast response time t_r < 200 ms. (action to reaction)
3) Ergonomic aspects e.g. symbol standards are not base of our work.
4) Economic design e.g.:
   - Battery life time, typical 1 year
   - Costs, availability on affordable components
   - Existing proven technology.
5) Expandable "future proof", "future protocols" new features.
6) Easy to install and to configure. Certain systems and application environments may require professional installation.
7) Mobile and fixed mounted devices.
8) Usable in other rooms.
9) Diffused (wide angle) and direct IR communication.

10) Feedback
    - Biofeedback e.g. visual or acoustics (unidirectional).
    - By IR acknowledge message (bi-directional).
11) Bi-directional communication, full message in bi-directional ways.
12) Use of IR Telegram Repeater should be possible.

1.2.2 Additional requirements for the advanced scenario

1) Communication in one and several rooms by using different media e.g. IR and TP, IR and Power Line Carrier or any other combination.
2) Feedback should be available also in case where biofeedback is not available.
3) Avoiding fault functions in other rooms e.g. by using a mobile IR-Transmitter.
4) The standard should provide for unidirectional and bi-directional communication.
5) data security Hamming Distance > 2 (e.g. parity-bit)
6) Classes Class 1: yes
   Class 2: t.b.d.
   Class 3: t.b.d.

1.3 Environmental Requirements

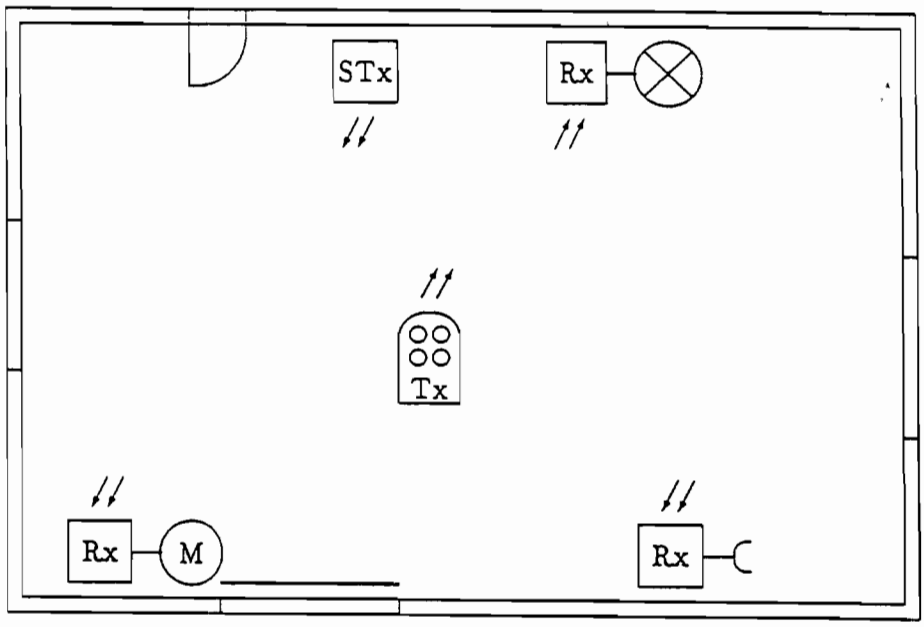
1) Coexistence (no wrong action) with independent local IR-applications with no connection to HBES.
2) Susceptibility against irradiation from vacuum fluorescent light sources should be good
3) Susceptibility against irradiation from sunlight should be good

2 Application scenarios

2.1 Room based

2.1.1 Light and shutter control

There is a fast biofeedback (visual, switch on / off and dim the lights, shutters go up or down) in the Light and Shutter application. In this case bi-directional communication is not a must.



Stx = IR-transmitter fixed
Tx = IR-transmitter handheld
Rx = IR-receiver with electrical actuator
M = shutter motor

Figure 1: Light and shutter control

2.1.2 Audio / video control

There is also a fast biofeedback (visual or acoustics) in most of the applications, except the Video programming.

Today: Most IR-systems are not compatible for both lighting and Audio / Video Application and are unidirectional.

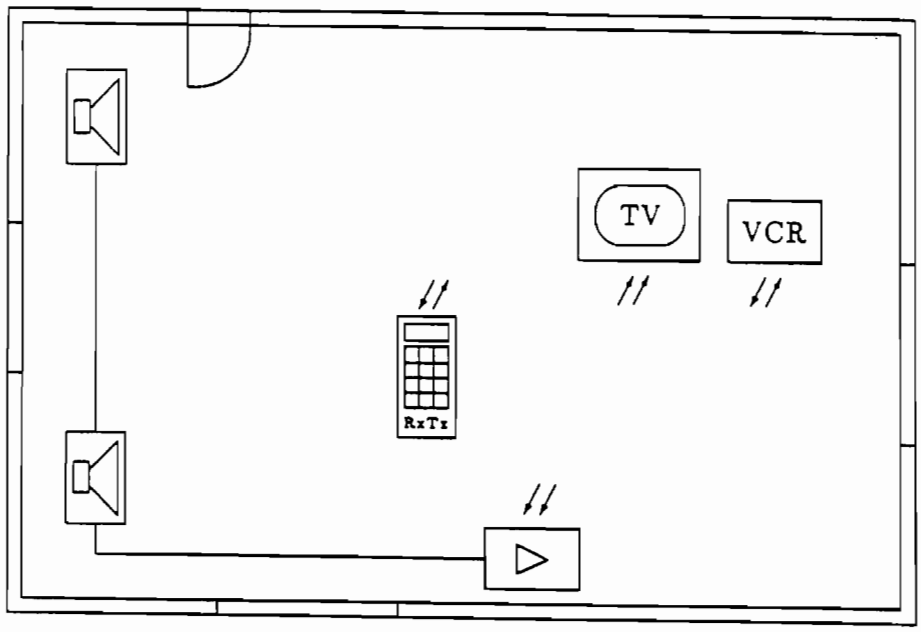


Figure 2: Audio / video control

2.1.3 Heating, ventilation and air-conditioning control

There is only a slow biofeedback (e.g. heat sense) therefore it is a must to feedback the status in an other way e.g. temperature display.

The thermostat can be in the temperature sensor (ϑRxTx) or in the heater actuator. If the thermostat is in the heater actuator, then the temperature sensor can be unidirectional (the temperature sensor can send the temperature value only when the temperature has changed or can send the values in intervals). The temperature sensor and the remote controller can also be combined.

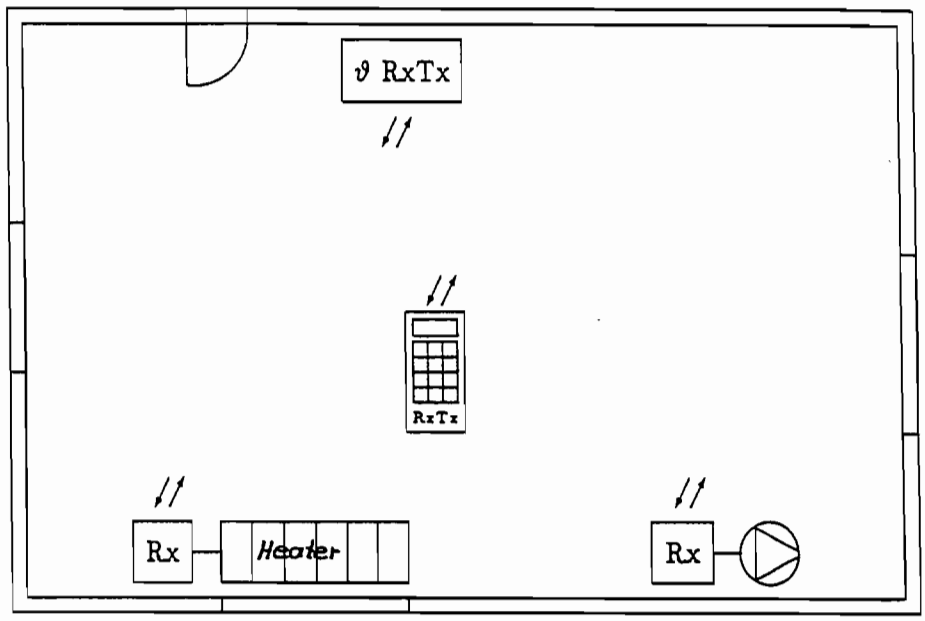


Figure 3: Heating, ventilation and air-conditioning control