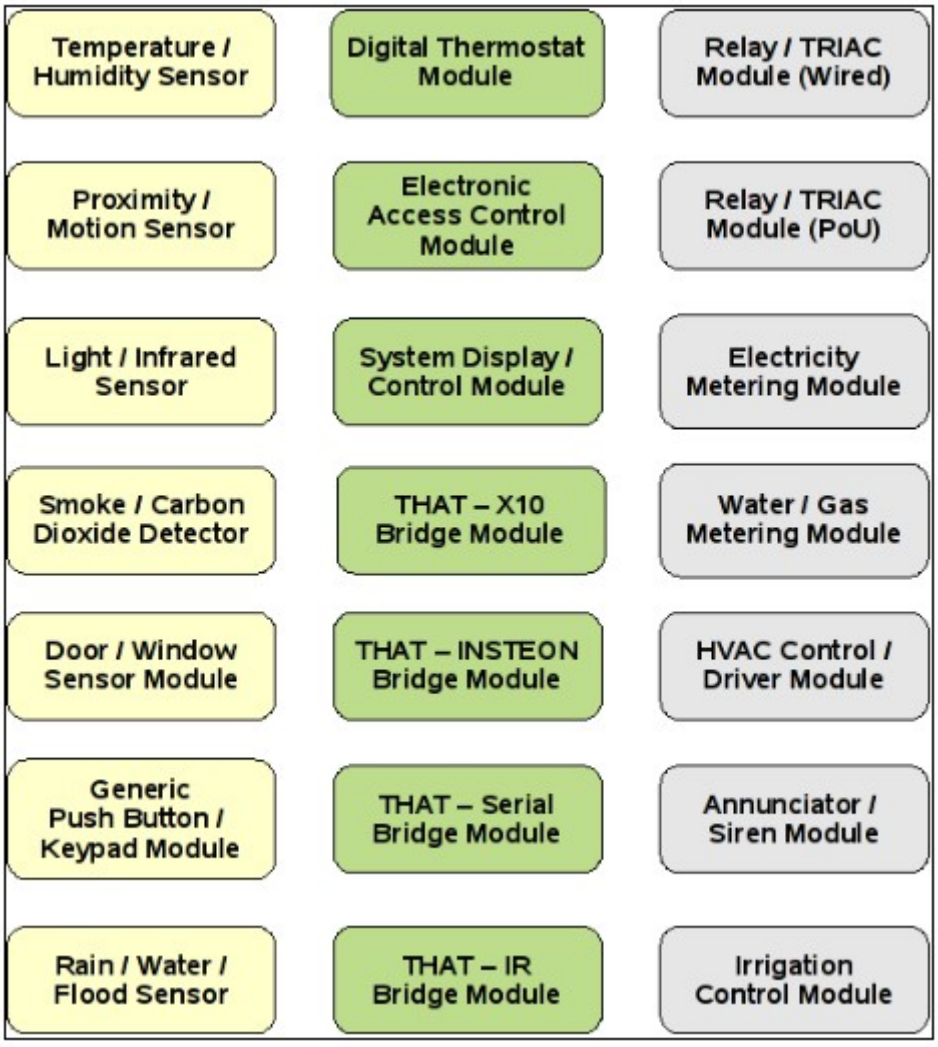
Project Introduction

2009-10-29 16:10:42 by Chris

The terms “home automation” and “building automation” are often used to describe a wide array of products and systems. These products aim to provide the user(s) with better, more-intelligent control over their environment as it relates to a home, building, or other indoor space. Unfortunately, most “automation” products are either inexpensive, simplistic, and severely limited in functionality, or they are very expensive, complex, and functionally chaotic.

THAT System

THAT Home Automation Topology, also known as THAT System, describes a new, comprehensive, IP/Ethernet-based home automation system developed by Nick Viera and Chris Miller. THAT System is designed to be as modular and economically feasible as possible, while retaining a rich, usable feature set. Possible modules to be designed for THAT System are shown in “THAT System Modules” below in Figure 1.



The morning of the first lab day dedicated to the development of THAT System was spent working on the function description of the system. The main goal was to make progress towards laying out specifications and a functional description of the Electronic Access Module (EAM), which my specific module for this project.

The primary design constraint for the EAM is that it adhere to the overall specifications laid out for all THAT

System modules. A summary of these specifications are listed below.

Topology Definition

The overall goals and initial design specifications for the basic topology behind THAT System are listed below.

- Overall Goals
    - Modularity on the lowest-level that is feasible.
    - Standardization of hardware to the largest extent possible.
    - Standardization of communication to the largest extent possible.
    - Form follows function.
    - Design integrity takes precedence over design cost.
    - Open Source Software for most functionality
    - Open Hardware for most functionality
    - “Freemium” philosophy for advanced functionality

- Hardware Design Goals
    - Link Protocol: 10BASE-T, 100BASE-TX Ethernet
    - Transport Protocol: UDP (possibly TCP for some modules)
    - Data Jack: 8P8C Modular jack
    - External Power Jack: 2.1mm barrel jack
    - Primary Power Supply: IEEE 802.3 Power over Ethernet (PoE)
    - Secondary Power Supply: External 12-48 VDC, 9-30 VAC
