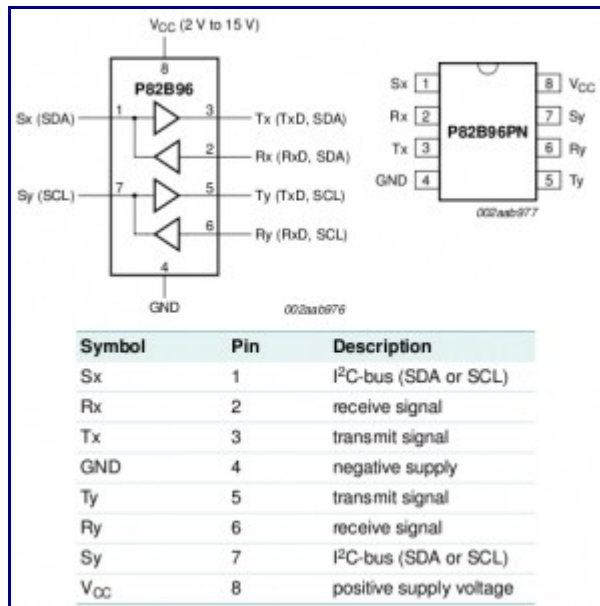


Sub-Module Communication

2010-02-25 14:02:55 by Chris



There will be communication taking place between the EAM and the Door Widget. It will consist of:

- Door Widget notifying the EAM of a doorbell button press
- Door Widget sending the EAM of a user-entered passcode and/or an RFID tag ID
- EAM notifying the Door Widget of its decision ("Access Granted", "Access Denied", etc.) for appropriate LED indicator and sound

These suggest that transmission data will be 1.) small and 2.) transmitted only a few times a day. There are several transmission protocols that I have considered. They are listed below with their pros and cons:

Ethernet

- **Pro:** Same hardware and firmware as the rest of THAT System
- **Pro:** Can travel as far as 300ft
- **Con:** Hardware overkill
- **Con:** Software overkill
- **Con:** Network switch required to have multiple sub-module nodes connected to EAM

RS-232

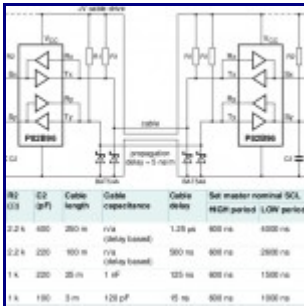
- **Pro:** Easy to implement in hardware (with RS-232 level shifter)
- **Neut:** Can travel 50ft before encountering capacitance issues (unless special cable is used)
- **Con:** Difficult to implement with more than one sub-module per bus

EIA-485

- **Pro:** Easy to implement in hardware
- **Pro:** Can travel as far as 4000ft!
- **Con:** Difficult to implement with more than one sub-module per bus

I²C + Bus Extender (See Fig. 1)

- **Pro:** Easy to implement in hardware
- **Pro:** Can travel 75ft with cable voltage of 5V over ordinary telephone cord (or 750ft with 12V) before encountering capacitance issues
- **Pro:** Multiple nodes per bus (max 112 with 7-bit address space)



For now I plan on using the NXP P82B96 I²C Bus Extender [Datasheet] to connect the EAM to the Door Widget. This method seems to be the most logical based on advantages it has over the alternatives. The P82B96 is available in 8-DIP form, from Digi-Key for \$3.64 in single quantities and for \$1.82 in quantities of 1,000.

Links:

- Digi-Key: P82B96 – <http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=568-1008-5-ND>
 - P82B96 Datasheet – http://www.nxp.com/documents/data_sheet/P82B96.pdf
 - NXP Long-distance Application Note: Successful mile-long I²C buses using this family of IC – <http://www.datasheetarchive.com/pdf/Datasheet-054/DSA004594.pdf>
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