

# Programming Embedded Interfaces : Project 1 Brief

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Assigned on February 4, 2005, toward March 4 or 16 final deadline.

**Summary:** Develop the firmware (inclusive serial-based API) + assemble a supporting blade and UI board for an LED or switch-based display or input.

## Details:

- 1) Find a partner (teams of two; one team will be three people). If you're not comfortable in soldering, it's in your interest to pair with someone who is. (There won't be much soldering involved, but you'll want to do it reasonably well; programming can become rather tricky on flaky circuits.)
- 2) Three of the teams will develop a simple display device; three of the teams will develop a simple input device.
- 3) In the second project, each team will pair up with one or more teams who've developed a complementary device, and link these using a high-level language with some network-based source and/or sink of information. Keep this in mind as you plan and propose your first project. More details will come in class.
- 4) For the display teams, most (if not all) should develop LED blade-based projects, probably incorporating 5-10 LEDs. If desired, a team could also work w/ a graphics LCD display (120x32 pixels)
- 5) For the sensor teams, most (if not all) should develop switch blade-based projects, probably incorporating 5-10 switches. If desired, a team could also work w/ a capacitive sensing blade (currently fabricated but not tested).
- 6) All teams should think about what each LED or switch might physically represent. Think "people, place, or thing;" also, check out:

<http://wiki.cct.lsu.edu/tangint/space/Physical-digital+associations>

Your physical layout of LEDs or switches should reflect a deliberate design decision along these lines. Alignment with your research topics or personal interests is encouraged. We'll discuss this in class.

## Timeline

- 1) **Friday, February 4, 2005:** Assignment posted
- 2) **Friday, February 11, 2005:** In-class discussion on preliminary project ideas
- 3) **Friday, February 18, 2005:** Project 1 proposals due, submitted both to the class Wiki and as a paper printout. In one to two printed pages (written together with your partner), you should name your team; describe the general hardware implementation (which blade, how many + which kind switches/LEDs, etc.) and the general firmware functionality you plan to provide. These proposals are subject to instructor approval and feedback.
- 4) **Friday, February 25, 2005:** A stable serial API implementing at least three different functions/modes (using several-character seven-bit ASCII msgs).
- 5) **Friday, March 4, 2005:** DISCUSS: either deadline or checkup/warm-up demos
- 6) **Wednesday, March 16, 2005:** DISCUSS: second deadline option

## EMBINT CALENDAR

	M	W	F	topic
1		19-Jan	21-Jan	Introduction and overview
2	24-Jan	26-Jan	28-Jan	Intro to the PIC microcontroller + basic electronics
3	31-Jan	2-Feb	4-Feb	Intro to the PIC, basic electronics, and <b>proj1 assignment</b>
4	7-Feb	9-Feb	11-Feb	Discussion and <b>brainstorming on Proj1</b>
5	14-Feb	16-Feb	18-Feb	Embint for sensors, displays, and actuators + <b>proj1 proposals</b>
6	21-Feb	23-Feb	25-Feb	Hands-on embedded programming + <b>proj1 api spec</b>
7	28-Feb	2-Mar	4-Mar	Intro to the Rabbit microcontroller; <b>midterm-prep HW</b> + <b>proj1 checkup</b>
8	7-Mar	9-Mar	11-Mar	mid-term test + proj1 convergence
9	14-Mar	16-Mar	18-Mar	<b>first project due</b> + debrief
10	21-Mar	23-Mar	25-Mar	
11	28-Mar	30-Mar	1-Apr	High-level programming of embedded interfaces
12	4-Apr	6-Apr	8-Apr	Planning and resources for second projects
13	11-Apr	13-Apr	15-Apr	Embedded interfaces for facilitating human interaction
14	18-Apr	20-Apr	22-Apr	Embedded interfaces to networks
15	25-Apr	27-Apr	29-Apr	Embedded interfaces to grids
16	2-May	4-May	6-May	Second project deadline + presentation