Signal specifications for the B12 mobile robot base control PIC

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This document covers the command signal interface for the control PIC. Serial communications between the PIC and the B12 base are not covered here.

1 PIC input signals

The PIC accepts command signal input on pin B1. The input line should be set low between commands.

An input command is encoded as a 16-bit string preceded by one high start bit. No trailing stop bit is necessary.

Each bit is 20ms long. Bits are sent as non-inverted TTL levels.

1.1 Data encoding

The first 8 bits of the 16-bit command are interpreted as an unsigned, big-endian integer. This first integer specifies a command type.

The second 8 bits of the 16-bit command are interpreted as an unsigned, big-endian integer. This second integer specifies an argument for the command.

For the remainder of this document, command-argument pairs will be denote by (x, y), which means a command type x with an argument value y.

1.2 Examples

The command $(0, 0)$ would be sent as the following string, where each character represents 20ms:

```
HLLLLLLLLLLLLLLLL
```

The command $(1, 1)$ would be sent as the following string:

```
HLLLLLLLHLLLLLLLH
```

The command $(3, 100)$ would be sent as the following string:

```
HLLLLLLHHLHHLLHLLL
```

2 PIC output

The PIC sends response signal output on pin B2. This signal consists only of a "ready for next command" flag. Pin B2 will be set to high when the PIC is ready to receive a new command. B2 will be set to low as soon as the PIC sees the leading edge of a new command's start bit.

Note that in the current implementation, the ready state is represented by a pulse train with 125ms long pulses on pin B2. This is necessary for the camera to register a change in its input pin, as a pin that is steadily high goes unnoticed. The non-ready state is still represented by a low value on pin B2.