

## **Aclock – The Intelligent Alarm Clock**

### **Abstract**

Occasionally, I end up waking up late in the morning wondering why my alarm clock didn't do its job. Actually, it does exactly what it was created to do. Unfortunately, it isn't smart enough to know that after I turned it off I fell immediately back to sleep. What I need is an alarm clock that won't shut off unless I am out of bed.

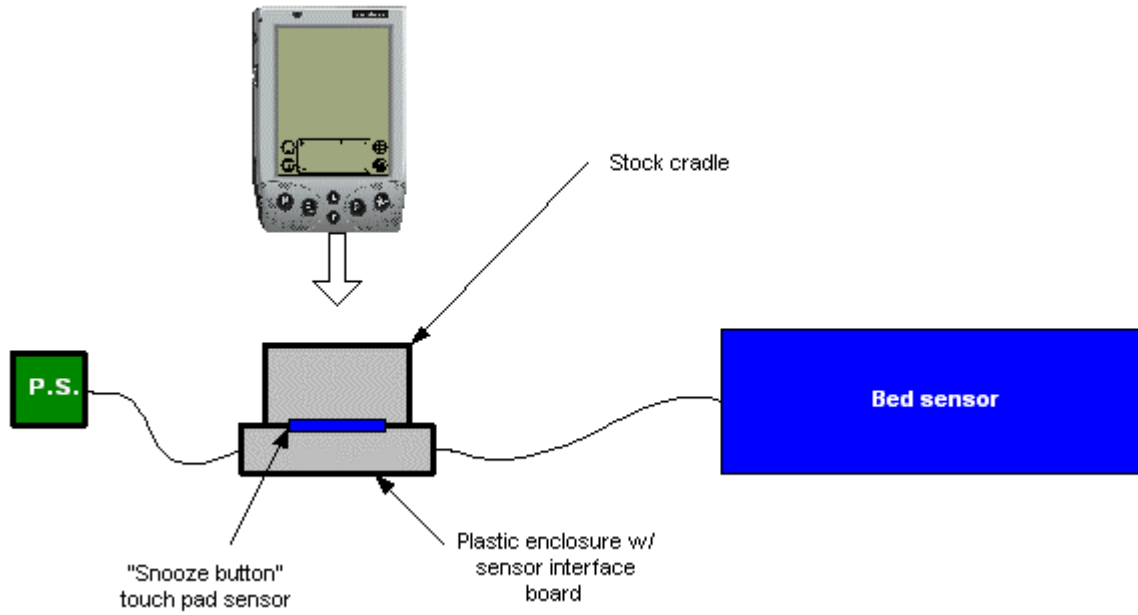
The Intelligent Alarm Clock is a Palm PDA application which is interfaced to sensors that detect your presence.

The PDA is inserted into a special docking station which is connected to a sensor interface board. One sensor is a touch pad snooze button. When the alarm is on, touching this sensor will bump the alarm time by 9 minutes. The second sensor is placed on the mattress, under the sheet and mattress cover. After touching the snooze button, touch and hold the snooze button for > 3 seconds to turn off the alarm. But it will only be turned off if no presence is detected by the bed sensor.

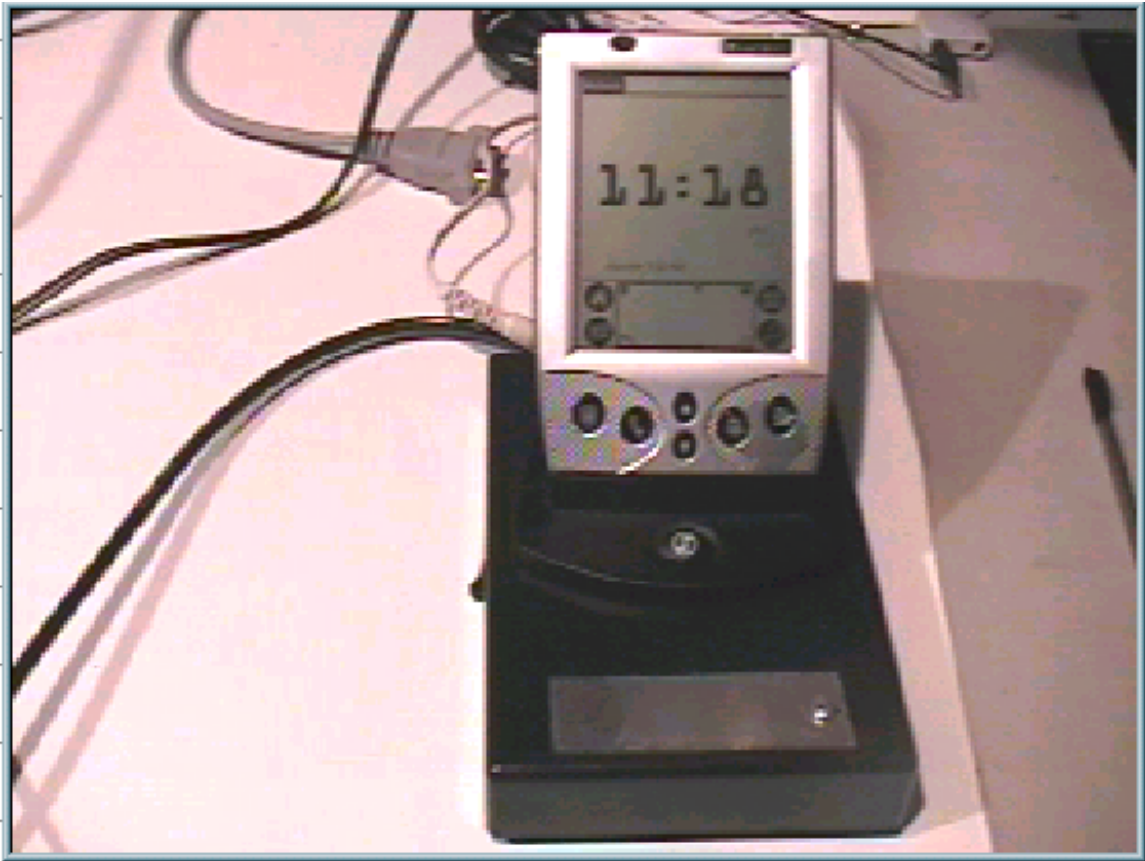
A PDA is chosen for the following reasons:

- Schedule for your day can be checked right away in the morning
- You can easily make notes if a thought hits you in the middle of the night
- You have to plug in your PDA to recharge the batteries anyway
- With wireless add-on hardware you can get up to the minute info. in the morning (traffic reports, weather conditions, security system, etc.)

## Block Diagram



**Photograph**



## Code Sample

```

/*****
 *
 * FUNCTION:      CheckSensors
 *
 * DESCRIPTION:  Reads the E1 and E2 efield sensors and determines
 *              a digital state for each sensor.
 *
 * PARAMETERS:
 *
 * RETURNED:
 *
 *****/
void CheckSensors( void )
{
    UInt32 data;

    if( use_sensors == false )
    {
        s1.state = false;
        s2.state = false;
        return;
    }

    //E1
    TransmitData( "s 1\r" );
    FlushReceiver();
    TransmitData( "x\r" );
    data = SerGetRcvByte();

    if( data == 65535 )
    {
        return;
    }

    s1.db <<= 1;
    if( data > 50 )
    {
        s1.db |= 0x01;
    }
    else
    {
    }

    if( (s1.state == false) && (s1.db == 0xff) )
    {
        s1.state = true;
        s1.time = TimGetSeconds();
    }
    else if( (s1.state == true) && (s1.db == 0x00) )
    {
        s1.state = false;
    }

    //E2
    TransmitData( "s 2\r" );
    FlushReceiver();
    TransmitData( "x\r" );
    data = SerGetRcvByte();
    if( data == 65535 )
    {
        return;
    }

    s2.db <<= 1;
    if( data > 50 )
    {
        s2.db |= 0x01;
    }
}

```

```
    else
    {
    }

    if( (s2.state == false) && (s2.db == 0xff) )
    {
        s2.state = true;
        s2.time = TimGetSeconds();
    }
    else if( (s2.state == true) && (s2.db == 0x00) )
    {
        s2.state = false;
    }
}
```

## Schematic

