

Integration of low-cost performant sensors and microcontroller (single board computer) (eg. MEMS-accelerometer, GPS receiver, low cost temperature sensor...)

Simple integration of low cost performant sensors within microcontrollersystems and/or open source hardware is feasible and relatively simple

- Very limited development cost (configurable standard 'blocks')
- low investment cost
- Short development cycle (rather 'configuring' than. 'programming' and data formatting)
- This application is extendible with diverse on-board I/Os, Wifi, RS232 upto a full-blown controller for controlling tasks (like PLC)

Figure 1: example of van low cost temperature sensor and PIR sensor (passive infrared motion sensor)



Figure 2: example of C-code function (algorithm)

```

Perform One PID Iteration
//=====
double PIDCalc( PID **pp,double NextPoint)
{
    double      dError,
                Error;

    pp->SumError += (Error = pp->SetPoint - NextPoint);
    if (Error==0)
    {
        pp->SumError=0;
    }
    else
    {
        if ( (pp->SumError)> (0.15*pp->SetPoint) )
        {
            pp->SumError=0.15*pp->SetPoint;
        }
        dError = pp->LastError - pp->PrevError;
        pp->PrevError = pp->LastError;
        pp->LastError = Error;
        return ( pp->Proportion * Error
                + pp->Integral * pp->SumError
                + pp->Derivative * dError
                );
    }
}

```

Figure 3: Integration of a standaard GPS receiver (31 euro) and signalconverter (< 4 euro) with a microcontroller (without specific hardware development / no PCB design)

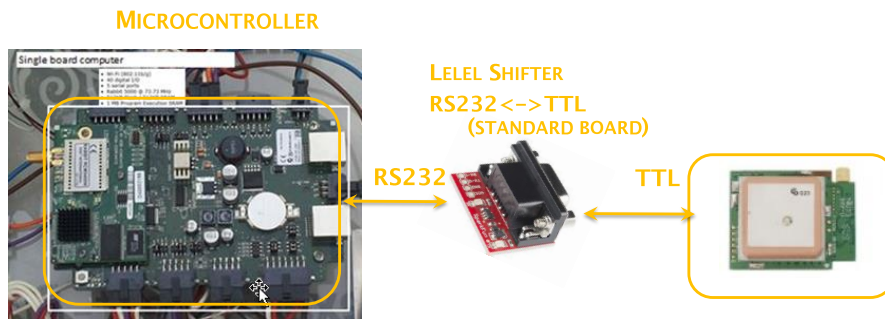
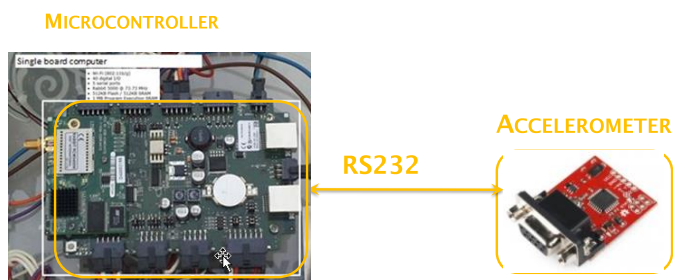


Figure 4: integration of a MEMS-accelerometer board (ca 24 euro) (with integrated proper microcontroller) and a single board computer /microcontroller.
De integrated microcontroller on the accelerometerboard (right) integrates the sensorsignals)



(In preparation)

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