

# Amsys Airspeed Sensor

## add to airframe

```
<firmware name="fixedwing">
  <define name="USE_I2C0"/>
  <define name="USE_AIRSPEED"/>
  <subsystem name="i2c"/>
</firmware>
<modules>
  <load name="airspeed_amsys.xml">
    <define name="AIRSPEED_SCALE" value="1."/>
    <define name="AIRSPEED_FILTER" value="0."/>
  </load>
</modules>
```

## add to settings

```
<dl_settings NAME="Airspeed">
  <dl_setting MAX="3" MIN="0" STEP="0.001" VAR="airspeed_scale" shortname="air_scale"
module="modules/sensors/airspeed_amsys" param="AIRSPEED_SCALE"/>
  <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="airspeed_filter" shortname="air_filter"
module="modules/sensors/airspeed_amsys" param="AIRSPEED_FILTER"/>
</dl_settings>
```

## add to messages.xml

**(you have to do a „make“ over the whole project if you change this file)**

```
<message name="AMSYS_AIRSPEED" id="67">
  <field name="asRaw" type="uint16"></field>
  <field name="asPressureOffset" type="float" unit="Pa"></field>
  <field name="asPressure" type="float" unit="Pa"></field>
  <field name="asAirspeed" type="float" unit="m/s"></field>
  <field name="asAirsFilt" type="float" unit="m/s"></field>
  <field name="asTemp" type="float" unit="°C"></field>
</message>
```

## copy

```
/conf/modules/airspeed_amsys.xml
/sw/airborne/modules/sensors/airspeed_amsys.c
/sw/airborne/modules/sensors/airspeed_amsys.h
```

# Amsys Baro

## add to airframe

```
<firmware name="fixedwing">
  <define name="USE_I2C0"/>
  <subsystem name="i2c"/>
</firmware>
<modules>
  <load name="baro_amsys.xml">
    <define name="BARO_FILTER" value="0."/>
  </load>
</modules>
```

## add to settings

```
<dl_settings NAME="Baro">
  <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="baro_filter" shortname="baro_filter"
module="modules/sensors/baro_amsys" param="BARO_FILTER"/>
</dl_settings>
```

## add to messages.xml

(you have to do a „make“ over the whole project if you change this file)

```
<message name="AMSYS_BARO" id="68">
  <field name="pBaroRaw" type="uint16"></field>
  <field name="pBaro" type="float" unit="Pa"> </field>
  <field name="pHomePressure" type="float" unit="Pa"></field>
  <field name="AltOffset" type="float" unit="m"></field>
  <field name="aktuell" type="float" unit="m"></field>
  <field name="Over_Ground" type="float" unit="m"></field>
  <field name="tempBaro" type="float" unit="°C"></field>
</message>
```

## copy

```
/conf/modules/baro_amsys.xml
/sw/airborne/modules/sensors/baro_amsys.c
/sw/airborne/modules/sensors/baro_amsys.h
```

# Sonar

## add to airframe

```
<firmware name="fixedwing">
  <define name="USE_I2C0"/>
</firmware>
<modules>
  <load name="sonar_adc.xml">
    <configure name="ADC_SONAR" value="ADC_5"/>
    <define name="SONAR_ADC_OFFSET" value="0"/>
    <define name="SONAR_ADC_SCALE" value="0.0"/>
  </load>
</modules>
```

## add to messages.xml

(you have to do a „make“ over the whole project if you change this file)

```
<message name="SONAR_ADC" id="59">
  <field name="ADC" type="uint16"></field>
  <field name="RAW" type="float" unit="m"> </field>
  <field name="HIGH" type="float" unit="m"></field>
</message>
```

## copy

```
/conf/modules/sonar_adc.xml
/sw/airborne/modules/sonar/sonar_adc.c
/sw/airborne/modules/sonar/sonar_adc.h
```

# Airspeed Controllloop Switch

## add to settings

```
<dl_setting MAX="2" MIN="0" STEP="1" VAR="airspeed_mode" shortname="as_mode_0-2"
module="guidance/guidance_v"/>
<dl_setting MAX="5" MIN="3" STEP="1" VAR="airspeed_mode" shortname="as_mode_3-5"
module="guidance/guidance_v"/>
```

```
<dl_settings NAME="Std_Vas">
  <dl_settings name="Standardregelung">
    <dl_setting MAX="1" MIN="0.0" STEP="0.05" VAR="v_ctl_auto_throttle_cruise_throttle" shortname="cruise throttle" module="guidance/guidance_v" handler="SetCruiseThrottle"
param="V_CTL_AUTO_THROTTLE_NOMINAL_CRUISE_THROTTLE">
      <strip_button name="Loiter" value="0.1"/>
      <strip_button name="Cruise" value="0"/>
      <strip_button name="Dash" value="1"/>
    </dl_setting>

    <dl_setting MAX="0.00" MIN="-0.05" STEP="0.005" VAR="v_ctl_auto_throttle_pgain" shortname="throttle_pgain" param="V_CTL_AUTO_THROTTLE_PGAIN"/>
    <dl_setting MAX="1" MIN="0.0" STEP="0.05" VAR="v_ctl_auto_throttle_igain" shortname="throttle_igain" param="V_CTL_AUTO_THROTTLE_IGAIN"/>
    <dl_setting MAX="2" MIN="0.0" STEP="0.1" VAR="v_ctl_auto_throttle_dgain" shortname="throttle_dgain"/>
    <dl_setting MAX="0" MIN="-4000" STEP="100" VAR="v_ctl_auto_throttle_dash_trim" shortname="dash trim"/>
    <dl_setting MIN="0" MAX="3000" STEP="100" VAR="v_ctl_auto_throttle_loiter_trim" shortname="loiter trim" param="V_CTL_AUTO_THROTTLE_LOITER_TRIM"/>
    <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_throttle_climb_throttle_increment" shortname="throttle_incr"
param="V_CTL_AUTO_THROTTLE_CLIMB_THROTTLE_INCREMENT"/>
    <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_throttle_pitch_of_vz_pgain" shortname="pitch_of_vz"
param="V_CTL_AUTO_THROTTLE_PITCH_OF_VZ_PGAIN"/>
    <dl_setting MAX="10" MIN="-10" STEP="0.1" VAR="v_ctl_auto_throttle_pitch_of_vz_dgain" shortname="pitch_of_vz (d)"/>
  </dl_settings>

  <dl_settings name="Vassillis">
    <dl_setting MAX="20" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_setpoint" shortname="airspeed_setpoint" module="guidance/guidance_v"
param="V_CTL_AUTO_AIRSPEED_SETPOINT"/>
    <dl_setting MAX="5" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_downtime" shortname="airspeed_downtime" param="V_CTL_AUTO_AIRSPEED_DOWNTIME"/>
    <dl_setting MAX="0.5" MIN="-0.5" STEP="0.01" VAR="v_ctl_auto_pitch_pgain_v" shortname="pitch_pgain" param="V_CTL_AUTO_PITCH_PGAIN_V"/>
    <dl_setting MAX="10" MIN="-10" STEP="0.1" VAR="v_ctl_auto_pitch_igain_v" shortname="pitch_igain" param="V_CTL_AUTO_PITCH_IGAIN_V"/>
    <dl_setting MAX="0.5" MIN="-0.5" STEP="0.005" VAR="v_ctl_auto_airspeed_pgain_v" shortname="airspeed_pgain" param="V_CTL_AUTO_AIRSPEED_PGAIN_V"/>
    <dl_setting MAX="1" MIN="0" STEP="0.005" VAR="v_ctl_auto_airspeed_igain_v" shortname="airspeed_igain" param="V_CTL_AUTO_AIRSPEED_IGAIN_V"/>
    <dl_setting MAX="20" MIN="0" STEP="0.01" VAR="v_ctl_auto_groundspeed_setpoint" shortname="gndsp_setpoint"
param="V_CTL_AUTO_GROUNDSPEED_SETPOINT"/>
    <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_pgain" shortname="gndsp_pgain" param="V_CTL_AUTO_GROUNDSPEED_PGAIN"/>
    <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_igain" shortname="gndsp_igain" param="V_CTL_AUTO_GROUNDSPEED_IGAIN"/>
  </dl_settings>

  <dl_settings NAME="Pitch">
    <dl_settings name="Pitch Climbrate">
      <dl_setting MAX="20" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_setpoint" shortname="airspeed_setpoint" module="guidance/guidance_v"
param="V_CTL_AUTO_AIRSPEED_SETPOINT"/>
      <dl_setting MAX="5" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_downtime" shortname="airspeed_downtime" param="V_CTL_AUTO_AIRSPEED_DOWNTIME"/>
      <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_prethrottle_aspc" shortname="prethrottle"
param="V_CTL_AUTO_AIRSPEED_PRETHROTTLE_ASPC"/>
      <dl_setting MAX="0" MIN="-0.3" STEP="0.001" VAR="v_ctl_auto_pitch_pgain_aspc" shortname="pitch_pgain" param="V_CTL_AUTO_PITCH_PGAIN_ASPC"/>
      <dl_setting MAX="0.1" MIN="0" STEP="0.001" VAR="v_ctl_auto_pitch_igain_aspc" shortname="pitch_igain" param="V_CTL_AUTO_PITCH_IGAIN_ASPC"/>
      <dl_setting MAX="0" MIN="-0.3" STEP="0.01" VAR="v_ctl_auto_airspeed_pgain_aspc" shortname="airspeed_pgain" param="V_CTL_AUTO_AIRSPEED_PGAIN_ASPC"/>
      <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="v_ctl_auto_airspeed_igain_aspc" shortname="airspeed_igain" param="V_CTL_AUTO_AIRSPEED_IGAIN_ASPC"/>
      <dl_setting MAX="20" MIN="0" STEP="0.01" VAR="v_ctl_auto_groundspeed_setpoint" shortname="gndsp_setpoint"
param="V_CTL_AUTO_GROUNDSPEED_SETPOINT"/>
      <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_pgain" shortname="gndsp_pgain" param="V_CTL_AUTO_GROUNDSPEED_PGAIN"/>
      <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_igain" shortname="gndsp_igain" param="V_CTL_AUTO_GROUNDSPEED_IGAIN"/>
    </dl_settings>

    <dl_settings name="Pitch Simple">
      <dl_setting MAX="20" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_setpoint" shortname="airspeed_setpoint" module="guidance/guidance_v"
param="V_CTL_AUTO_AIRSPEED_SETPOINT"/>
      <dl_setting MAX="5" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_downtime" shortname="airspeed_downtime" param="V_CTL_AUTO_AIRSPEED_DOWNTIME"/>
      <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_prethrottle_asps" shortname="prethrottle"
param="V_CTL_AUTO_AIRSPEED_PRETHROTTLE_ASPS"/>
      <dl_setting MAX="0" MIN="-0.3" STEP="0.001" VAR="v_ctl_auto_pitch_pgain_asps" shortname="pitch_pgain" param="V_CTL_AUTO_PITCH_PGAIN_ASPS"/>
      <dl_setting MAX="0.1" MIN="0" STEP="0.001" VAR="v_ctl_auto_pitch_igain_asps" shortname="pitch_igain" param="V_CTL_AUTO_PITCH_IGAIN_ASPS"/>
      <dl_setting MAX="0" MIN="-0.3" STEP="0.01" VAR="v_ctl_auto_airspeed_pgain_asps" shortname="airspeed_pgain" param="V_CTL_AUTO_AIRSPEED_PGAIN_ASPS"/>
      <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="v_ctl_auto_airspeed_igain_asps" shortname="airspeed_igain" param="V_CTL_AUTO_AIRSPEED_IGAIN_ASPS"/>
      <dl_setting MAX="20" MIN="0" STEP="0.01" VAR="v_ctl_auto_groundspeed_setpoint" shortname="gndsp_setpoint"
param="V_CTL_AUTO_GROUNDSPEED_SETPOINT"/>
      <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_pgain" shortname="gndsp_pgain" param="V_CTL_AUTO_GROUNDSPEED_PGAIN"/>
      <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_groundspeed_igain" shortname="gndsp_igain" param="V_CTL_AUTO_GROUNDSPEED_IGAIN"/>
    </dl_settings>

    <dl_settings name="Manual Power">
```

```

        <dl_setting MAX="20" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_setpoint" shortname="airspeed_setpoint" module="guidance/guidance_v"
param="V_CTL_AUTO_AIRSPEED_SETPOINT"/>
        <dl_setting MAX="5" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_downtime" shortname="airspeed_downtime" param="V_CTL_AUTO_AIRSPEED_DOWNTIME"/>
        <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_throttlestp_asmp" shortname="throttlestp"
param="V_CTL_AUTO_AIRSPEED_THROTTLESETP_ASMP"/>
        <dl_setting MAX="0" MIN="-0.3" STEP="0.001" VAR="v_ctl_auto_pitch_pgain_asmp" shortname="pitch_pgain" param="V_CTL_AUTO_PITCH_PGAIN_ASMP"/>
        <dl_setting MAX="0.1" MIN="0" STEP="0.001" VAR="v_ctl_auto_pitch_igain_asmp" shortname="pitch_igain" param="V_CTL_AUTO_PITCH_IGAIN_ASMP"/>
        <dl_setting MAX="20" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_setpoint" shortname="gndsp_setpoint"
param="V_CTL_AUTO_GROUNDSPEED_SETPOINT"/>
        <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_airspeed_pgain" shortname="gndsp_pgain" param="V_CTL_AUTO_GROUNDSPEED_PGAIN"/>
        <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_airspeed_igain" shortname="gndsp_igain" param="V_CTL_AUTO_GROUNDSPEED_IGAIN"/>
    </dl_settings>

    <dl_settings name="Pitch Acceleration">
        <dl_setting MAX="20" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_setpoint" shortname="airspeed_setpoint" module="guidance/guidance_v"
param="V_CTL_AUTO_AIRSPEED_SETPOINT"/>
        <dl_setting MAX="5" MIN="0" STEP="0.1" VAR="v_ctl_auto_airspeed_downtime" shortname="airspeed_downtime" param="V_CTL_AUTO_AIRSPEED_DOWNTIME"/>
        <dl_setting MAX="1" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_prethrottle_aspa" shortname="prethrottle"
param="V_CTL_AUTO_AIRSPEED_PRETHROTTLE_ASPA"/>
        <dl_setting MAX="0" MIN="-0.3" STEP="0.001" VAR="v_ctl_auto_pitch_pgain_aspa" shortname="pitch_pgain" param="V_CTL_AUTO_PITCH_PGAIN_ASPA"/>
        <dl_setting MAX="0.1" MIN="0" STEP="0.001" VAR="v_ctl_auto_pitch_igain_aspa" shortname="pitch_igain" param="V_CTL_AUTO_PITCH_IGAIN_ASPA"/>
        <dl_setting MAX="0" MIN="-0.3" STEP="0.01" VAR="v_ctl_auto_airspeed_pgain_aspa" shortname="airspeed_pgain" param="V_CTL_AUTO_AIRSPEED_PGAIN_ASPA"/>
        <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="v_ctl_auto_airspeed_igain_aspc" shortname="airspeed_igain" param="V_CTL_AUTO_AIRSPEED_IGAIN_ASPA"/>
        <dl_setting MAX="3" MIN="0" STEP="0.1" VAR="v_ctl_altitude_max_accel" shortname="max_accel" param="V_CTL_ALTITUDE_MAX_ACCEL"/>
        <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="v_ctl_airspeed_acc_filter_value" shortname="acc_filter_value" param="V_CTL_AIRSPEED_ACC_FILTER_VALUE"/>
        <dl_setting MAX="1" MIN="0" STEP="0.001" VAR="v_ctl_accel_pgain" shortname="accel_pgain" param="V_CTL_ACCEL_PGAIN"/>
        <dl_setting MAX="20" MIN="0" STEP="0.01" VAR="v_ctl_auto_airspeed_setpoint" shortname="gndsp_setpoint"
param="V_CTL_AUTO_GROUNDSPEED_SETPOINT"/>
        <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_airspeed_pgain" shortname="gndsp_pgain" param="V_CTL_AUTO_GROUNDSPEED_PGAIN"/>
        <dl_setting MAX="1" MIN="0" STEP="0.025" VAR="v_ctl_auto_airspeed_igain" shortname="gndsp_igain" param="V_CTL_AUTO_GROUNDSPEED_IGAIN"/>
    </dl_settings>

```

## add to messages.xml

(you have to do a „make“ over the whole project if you change this file)

```

<message name="AS_GUIDANCE" id="71">
    <field name="AS_Mode" type="uint8"></field>
    <field name="AS_Setp_Ctr" type="float"></field>
    <field name="AS_Error" type="float"></field>
    <field name="GS_Error" type="float"></field>
    <field name="nav_pitch" type="float"></field>
    <field name="throttle_setp" type="float"></field>
    <field name="f_throttle" type="float"></field>
</message>

```

## copy and replace

/sw/airborne/firmwares/fixedwing/guidance/guidance\_v.c

/sw/airborne/firmwares/fixedwing/guidance/guidance\_v.h