Parameter Reference

This list is auto-generated from the source code and contains the most recent parameter documentation.

Attitude EKF estimator

Name	Description	Min	Max	Default
	Comment			
EKF_ATT_V3_Q0	Body angular rate process noise			1e-4
EKF_ATT_V3_Q1	Body angular acceleration process noise			0.08
EKF_ATT_V3_Q2	Acceleration process noise			0.009
EKF_ATT_V3_Q3	Magnet field vector process noise			0.005
EKF_ATT_V4_R0	Gyro measurement noise			0.0008
EKF_ATT_V4_R1	Accel measurement noise			10000.0
EKF_ATT_V4_R2	Mag measurement noise			100.0
ATT_J11	Moment of inertia matrix diagonal entry (1, 1)			0.0018
ATT_J22	Moment of inertia matrix diagonal entry (2, 2)			0.0018
ATT_J33	Moment of inertia matrix diagonal entry (3, 3)			0.0037
ATT_J_EN	Moment of inertia enabled in estimator			0
	If set to != 0 the moment of inertia will be used in the estimator			

Attitude Q estimator

Name	Description	Min	Max	Default
	Comment			
ATT_W_ACC	Complimentary filter accelerometer weight	0	1	0.2
ATT_W_MAG	Complimentary filter magnetometer weight	0	1	0.1
ATT_W_EXT_HDG	Complimentary filter external heading weight	0	1	0.1
ATT_W_GYRO_BIAS	Complimentary filter gyroscope bias weight	0	1	0.1
ATT_MAG_DECL	Magnetic declination, in degrees			0.0

Name	Description	Min	Max	Default
	Comment			
	This parameter is not used in normal operation, as the declination is looked up based on the GPS coordinates of the vehicle.			
ATT_MAG_DECL_A	Automatic GPS based declination compensation			1
ATT_EXT_HDG_M	External heading usage mode (from Motion capture/Vision) Set to 1 to use heading estimate from vision. Set to 2 to use heading from motion capture	0	2	0
ATT_ACC_COMP	Acceleration compensation based on GPS velocity			1
ATT_BIAS_MAX	Gyro bias limit	0	2	0.05
ATT_VIBE_THRESH	Threshold (of RMS) to warn about high vibration levels	0.01	10	0.2

Battery Calibration

Name	Description	Min	Max	Default
	Comment			
BAT_V_SCALE_IO	Scaling factor for battery voltage sensor on PX4IO	1	100000	10000
BAT_CNT_V_VOLT	Scaling from ADC counts to volt on the ADC input (battery voltage)			-1.0
	This is not the battery voltage, but the intermediate ADC voltage. A value of -1 signifies that the board defaults are used, which is highly recommended.			
BAT_CNT_V_CURR	Scaling from ADC counts to volt on the ADC input (battery current)			-1.0
	This is not the battery current, but the intermediate ADC voltage. A value of -1 signifies that the board defaults are used, which is highly recommended.			
BAT_V_OFFS_CURR	Offset in volt as seen by the ADC input of the current sensor			0.0
	This offset will be subtracted before calculating the battery current based on the voltage.			
BAT_V_DIV	Battery voltage divider (V divider)			-1.0

Name	Description	Min	Max	Default
	Comment			
	This is the divider from battery voltage to 3.3V ADC voltage. If using e.g. Mauch power modules the value from the datasheet can be applied straight here. A value of -1 means to use the board default.			
BAT_A_PER_V	Battery current per volt (A/V)			-1.0
	The voltage seen by the 3.3V ADC multiplied by this factor will determine the battery current. A value of -1 means to use the board default.			
BAT_SOURCE	Battery monitoring source	0	1	0
	This parameter controls the source of battery data. The value 'Power Module' means that measurements are expected to come from a power module. If the value is set to 'External' then the system expects to receive mavlink battery status messages.			
BAT_V_EMPTY	Empty cell voltage (5C load)			3.4
	Defines the voltage where a single cell of the battery is considered empty. The voltage should be chosen before the steep dropoff to 2.8V. A typical lithium battery can only be discharged down to 10% before it drops off to a voltage level damaging the cells.			
BAT_V_CHARGED	Full cell voltage (5C load)			4.05
	Defines the voltage where a single cell of the battery is considered full under a mild load. This will never be the nominal voltage of 4.2V			
BAT_LOW_THR	Low threshold	0.12	0.4	0.15
	Sets the threshold when the battery will be reported as low. This has to be higher than the critical threshold.			
BAT_CRIT_THR	Critical threshold	0.05	0.1	0.07
	Sets the threshold when the battery will be reported as critically low. This has to be lower than the low threshold. This threshold commonly will trigger RTL or landing.			
BAT_V_LOAD_DROP	Voltage drop per cell on full throttle	0.07	0.5	0.3

Name	Description	Min	Max	Default
	Comment			
	This implicitely defines the internal resistance to maximum current ratio and assumes linearity. A good value to use is the difference between the 5C and 20-25C load.			
BAT_N_CELLS	Number of cells			3
	Defines the number of cells the attached battery consists of.			
BAT_CAPACITY	Battery capacity	-1.0	100000	-1.0
	Defines the capacity of the attached battery.			

Camera trigger

Name	Description	Min	Max	Default
	Comment			
TRIG_INTERVAL	Camera trigger interval	4.0	10000.0	40.0
	This parameter sets the time between two consecutive trigger events			
TRIG_POLARITY	Camera trigger polarity	0	1	0
	This parameter sets the polarity of the trigger (0 = active low, 1 = active high)			
TRIG_ACT_TIME	Camera trigger activation time	0.1	3	0.5
	This parameter sets the time the trigger needs to pulled high or low.			
TRIG_MODE	Camera trigger mode	0	4	0
TRIG_PINS	Camera trigger pin	1	123456	12
	Selects which pin is used, ranges from 1 to 6 (AUX1-AUX6)			
TRIG_DISTANCE	Camera trigger distance	0		25.0
	Sets the distance at which to trigger the camera.			

Circuit Breaker

Name	Description	Min	Max	Default
	Comment			
CBRK_SUPPLY_CHK	Circuit breaker for power supply check	0	894281	0
	Setting this parameter to 894281 will disable the power valid checks in the commander. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_RATE_CTRL	Circuit breaker for rate controller output	0	140253	0
	Setting this parameter to 140253 will disable the rate controller uORB publication. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_IO_SAFETY	Circuit breaker for IO safety	0	22027	0
	Setting this parameter to 22027 will disable IO safety. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_AIRSPD_CHK	Circuit breaker for airspeed sensor	0	162128	0
	Setting this parameter to 162128 will disable the check for an airspeed sensor. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_FLIGHTTERM	Circuit breaker for flight termination	0	121212	121212
	Setting this parameter to 121212 will disable the flight termination action. –> The IO driver will not do flight termination if requested by the FMU WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_ENGINEFAIL	Circuit breaker for engine failure detection	0	284953	284953
	Setting this parameter to 284953 will disable the engine failure detection. If the aircraft is in engine failure mode the engine failure flag will be set to healthy WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_GPSFAIL	Circuit breaker for GPS failure detection	0	240024	0
	Setting this parameter to 240024 will disable the GPS failure detection. If this check is enabled, then the sensor check will fail if the GPS module is missing. It will also check for excessive signal noise on the GPS receiver and warn the user if detected. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_BUZZER	Circuit breaker for disabling buzzer	0	782097	0

Name	Description	Min	Max	Default
	Comment			
	Setting this parameter to 782097 will disable the buzzer audio notification. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			
CBRK_USB_CHK	Circuit breaker for USB link check	0	197848	0
	Setting this parameter to 197848 will disable the USB connected checks in the commander. WARNING: ENABLING THIS CIRCUIT BREAKER IS AT OWN RISK			

Commander

Name	Description	Min	Max	Default
	Comment			
COM_DL_LOSS_T	Datalink loss time threshold	5	300	10
	After this amount of seconds without datalink the data link lost mode triggers			
COM_DL_REG_T	Datalink regain time threshold	0	3	0
	After a data link loss: after this this amount of seconds with a healthy datalink the 'datalink loss' flag is set back to false			
COM_EF_THROT	Engine Failure Throttle Threshold	0.0	1.0	0.5
	Engine failure triggers only above this throttle value			
COM_EF_C2T	Engine Failure Current/Throttle Threshold	0.0	50.0	5.0
	Engine failure triggers only below this current value			
COM_EF_TIME	Engine Failure Time Threshold	0.0	60.0	10.0
	Engine failure triggers only if the throttle threshold and the current to throttle threshold are violated for this time			
COM_RC_LOSS_T	RC loss time threshold	0	35	0.5
	After this amount of seconds without RC connection the rc lost flag is set to true			
COM_HOME_H_T	Home set horizontal threshold	2	15	5.0

Name	Description	Min	Max	Default
	Comment			
	The home position will be set if the estimated positioning accuracy is below the threshold.			
COM_HOME_V_T	Home set vertical threshold	5	25	10.0
	The home position will be set if the estimated positioning accuracy is below the threshold.			
COM_AUTOS_PAR	Autosaving of params			1
	If not equal to zero the commander will automatically save parameters to persistent storage once changed. Default is on, as the interoperability with currently deployed GCS solutions depends on parameters being sticky. Developers can default it to off.			
COM_RC_IN_MODE	RC control input mode	0	2	0
	The default value of 0 requires a valid RC transmitter setup. Setting this to 1 allows joystick control and disables RC input handling and the associated checks. A value of 2 will generate RC control data from manual input received via MAVLink instead of directly forwarding the manual input data.			
COM_RC_ARM_HYST	RC input arm/disarm command duration	100	1500	1000
	The default value of 1000 requires the stick to be held in the arm or disarm position for 1 second.			
COM_DISARM_LAND	Time-out for auto disarm after landing	0	20	0
	A non-zero, positive value specifies the time-out period in seconds after which the vehicle will be automatically disarmed in case a landing situation has been detected during this period. A value of zero means that automatic disarming is disabled.			
COM_ARM_WO_GPS	Allow arming without GPS	0	1	1
	The default allows to arm the vehicle without GPS signal.			
COM_LOW_BAT_ACT	Battery failsafe mode			0
	Action the system takes on low battery. Defaults to off			

Name	Description	Min	Max	Default
	Comment			
COM_OF_LOSS_T	Time-out to wait when offboard connection is lost before triggering offboard lost action. See COM_OBL_ACT and COM_OBL_RC_ACT to configure action	0	60	0.0

Data Link Loss

Name	Description	Min	Max	Default
	Comment			
NAV_DLL_CH_T	Comms hold wait time	0.0	3600.0	120.0
	The amount of time in seconds the system should wait at the comms hold waypoint			
NAV_DLL_CH_LAT	Comms hold Lat	-900000000	900000000	-266072120
	Latitude of comms hold waypoint			
NAV_DLL_CH_LON	Comms hold Lon	-1800000000	1800000000	1518453890
	Longitude of comms hold waypoint			
NAV_DLL_CH_ALT	Comms hold alt	-50	30000	600.0
	Altitude of comms hold waypoint			
NAV_DLL_AH_T	Airfield home wait time	0.0	3600.0	120.0
	The amount of time in seconds the system should wait at the airfield home waypoint			
NAV_DLL_N	Number of allowed Datalink timeouts	0	1000	2
	After more than this number of data link timeouts the aircraft returns home directly			
NAV_DLL_CHSK	Skip comms hold wp			0
	If set to 1 the system will skip the comms hold wp on data link loss and will directly fly to airfield home			
NAV_AH_LAT	Airfield home Lat	-900000000	900000000	-265847810

Name	Description	Min	Max	Default
	Comment			
	Latitude of airfield home waypoint			
NAV_AH_LON	Airfield home Lon	-1800000000	1800000000	1518423250
	Longitude of airfield home waypoint			
NAV_AH_ALT	Airfield home alt	-50		600.0
	Altitude of airfield home waypoint			

EKF2

Name	Description	Min	Max	Default
	Comment			
EKF2_MAG_DELAY	Magnetometer measurement delay relative to IMU measurements	0	300	0
EKF2_BARO_DELAY	Barometer measurement delay relative to IMU measurements	0	300	0
EKF2_GPS_DELAY	GPS measurement delay relative to IMU measurements	0	300	200
EKF2_OF_DELAY	Optical flow measurement delay relative to IMU measurements Assumes measurement is timestamped at trailing edge of integration period	0	300	5
EKF2_RNG_DELAY	Range finder measurement delay relative to IMU measurements	0	300	5
EKF2_ASP_DELAY	Airspeed measurement delay relative to IMU measurements	0	300	200
EKF2_EV_DELAY	Vision Position Estimator delay relative to IMU measurements	0	300	175
EKF2_GPS_CHECK	Integer bitmask controlling GPS checks	0	511	21

Name	Description	Min	Max	Default
	Comment			
	Set bits to 1 to enable checks. Checks enabled by the following bit positions 0 : Minimum required sat count set by EKF2_REQ_NSATS 1 : Minimum required GDoP set by EKF2_REQ_GDOP 2 : Maximum allowed horizontal position error set by EKF2_REQ_EPH 3 : Maximum allowed vertical position error set by EKF2_REQ_EPV 4 : Maximum allowed speed error set by EKF2_REQ_SACC 5 : Maximum allowed horizontal position rate set by EKF2_REQ_HDRIFT. This check can only be used if the vehciel is stationary during alignment. 6 : Maximum allowed vertical position rate set by EKF2_REQ_VDRIFT. This check can only be used if the vehciel is stationary during alignment. 7 : Maximum allowed horizontal speed set by EKF2_REQ_HDRIFT. This check can only be used if the vehciel is stationary during alignment. 8 : Maximum allowed vertical velocity discrepancy set by EKF2_REQ_VDRIFT			
EKF2_REQ_EPH	Required EPH to use GPS	2	100	5.0
EKF2_REQ_EPV	Required EPV to use GPS	2	100	8.0
EKF2_REQ_SACC	Required speed accuracy to use GPS	0.5	5.0	1.0
EKF2_REQ_NSATS	Required satellite count to use GPS	4	12	6
EKF2_REQ_GDOP	Required GDoP to use GPS	1.5	5.0	2.5
EKF2_REQ_HDRIFT	Maximum horizontal drift speed to use GPS	0.1	1.0	0.3
EKF2_REQ_VDRIFT	Maximum vertical drift speed to use GPS	0.1	1.5	0.5
EKF2_GYR_NOISE	Rate gyro noise for covariance prediction	0.0001	0.1	1.5e-2
EKF2_ACC_NOISE	Accelerometer noise for covariance prediction	0.01	1.0	3.5e-1
EKF2_GYR_B_NOISE	Process noise for IMU rate gyro bias prediction	0.0	0.01	1.0e-3
EKF2_ACC_B_NOISE	Process noise for IMU accelerometer bias prediction	0.0	0.01	3.0e-3
EKF2_MAG_B_NOISE	Process noise for body magnetic field prediction	0.0	0.1	1.0e-4
EKF2_MAG_E_NOISE	Process noise for earth magnetic field prediction	0.0	0.1	1.0e-3
EKF2_WIND_NOISE	Process noise for wind velocity prediction	0.0	1.0	1.0e-1
EKF2_GPS_V_NOISE	Measurement noise for gps horizontal velocity	0.01	5.0	0.5
EKF2_GPS_P_NOISE	Measurement noise for gps position	0.01	10.0	0.5
EKF2_NOAID_NOISE	Measurement noise for non-aiding position hold	0.5	50.0	10.0
EKF2_BARO_NOISE	Measurement noise for barometric altitude	0.01	15.0	2.0

Name	Description	Min	Max	Default
	Comment			
EKF2_HEAD_NOISE	Measurement noise for magnetic heading fusion	0.01	1.0	0.3
EKF2_MAG_NOISE	Measurement noise for magnetometer 3-axis fusion	0.001	1.0	5.0e-2
EKF2_EAS_NOISE	Measurement noise for airspeed fusion	0.5	5.0	1.4
EKF2_MAG_DECL	Magnetic declination			0
EKF2_HDG_GATE	Gate size for magnetic heading fusion	1.0		2.6
EKF2_MAG_GATE	Gate size for magnetometer XYZ component fusion	1.0		3.0
EKF2_DECL_TYPE	Integer bitmask controlling handling of magnetic declination	0	7	7
	Set bits in the following positions to enable functions. 0 : Set to true to use the declination from the geo_lookup library when the GPS position becomes available, set to false to always use the EKF2_MAG_DECL value. 1 : Set to true to save the EKF2_MAG_DECL parameter to the value returned by the EKF when the vehicle disarms. 2 : Set to true to always use the declination as an observaton when 3-axis magnetometer fusion is being used.			
EKF2_MAG_TYPE	Type of magnetometer fusion			0
	Integer controlling the type of magnetometer fusion used - magnetic heading or 3-axis magnetometer. If set to automatic: heading fusion on-ground and 3-axis fusion in-flight			
EKF2_BARO_GATE	Gate size for barometric height fusion	1.0		5.0
EKF2_GPS_P_GATE	Gate size for GPS horizontal position fusion	1.0		5.0
EKF2_GPS_V_GATE	Gate size for GPS velocity fusion	1.0		5.0
EKF2_TAS_GATE	Gate size for TAS fusion	1.0		3.0
EKF2_REC_RPL	Replay mode			0
	A value of 1 indicates that the ekf2 module will publish replay messages for logging.			
EKF2_AID_MASK	Integer bitmask controlling data fusion and aiding methods	0	28	1

Name	Description	Min	Max	Default
	Comment			
	Set bits in the following positions to enable: 0 : Set to true to use GPS data if available 1 : Set to true to use optical flow data if available 2 : Set to true to inhibit IMU bias estimation 3 : Set to true to enable vision position fusion 4 : Set to true to enable vision yaw fusion *			
EKF2_HGT_MODE	Determines the primary source of height data used by the EKF			0
	The range sensor option should only be used when for operation over a flat surface as the local NED origin will move up and down with ground level.			
EKF2_RNG_NOISE	Measurement noise for range finder fusion	0.01		0.1
EKF2_RNG_GATE	Gate size for range finder fusion	1.0		5.0
EKF2_MIN_RNG	Minimum valid range for the range finder	0.01		0.1
EKF2_EVP_NOISE	Measurement noise for vision position observations used when the vision system does not supply error estimates	0.01		0.05
EKF2_EVA_NOISE	Measurement noise for vision angle observations used when the vision system does not supply error estimates	0.01		0.05
EKF2_EV_GATE	Gate size for vision estimate fusion	1.0		5.0
EKF2_MIN_EV	Minimum valid range for the vision estimate	0.01		0.01
EKF2_OF_N_MIN	Measurement noise for the optical flow sensor when it's reported quality metric is at the maximum	0.05		0.15
EKF2_OF_N_MAX	Measurement noise for the optical flow sensor	0.05		0.5
	(when it's reported quality metric is at the minimum set by EKF2_OF_QMIN). The following condition must be met: EKF2_OF_N_MAXN >= EKF2_OF_N_MIN			
EKF2_OF_QMIN	Optical Flow data will only be used if the sensor reports a quality metric >= EKF2_OF_QMIN	0	255	1
EKF2_OF_GATE	Gate size for optical flow fusion	1.0		3.0
EKF2_OF_RMAX	Optical Flow data will not fused if the magnitude of the flow rate > EKF2_OF_RMAX	1.0		2.5

Name	Description	Min	Max	Default
	Comment			
EKF2_TERR_NOISE	Terrain altitude process noise - accounts for instability in vehicle height estimate	0.5		5.0
EKF2_TERR_GRAD	Magnitude of terrain gradient	0.0		0.5
EKF2_IMU_POS_X	X position of IMU in body frame			0.0
EKF2_IMU_POS_Y	Y position of IMU in body frame			0.0
EKF2_IMU_POS_Z	Z position of IMU in body frame			0.0
EKF2_GPS_POS_X	X position of GPS antenna in body frame			0.0
EKF2_GPS_POS_Y	Y position of GPS antenna in body frame			0.0
EKF2_GPS_POS_Z	Z position of GPS antenna in body frame			0.0
EKF2_RNG_POS_X	X position of range finder origin in body frame			0.0
EKF2_RNG_POS_Y	Y position of range finder origin in body frame			0.0
EKF2_RNG_POS_Z	Z position of range finder origin in body frame			0.0
EKF2_OF_POS_X	X position of optical flow focal point in body frame			0.0
EKF2_OF_POS_Y	Y position of optical flow focal point in body frame			0.0
EKF2_OF_POS_Z	Z position of optical flow focal point in body frame			0.0
EKF2_EV_POS_X	X position of VI sensor focal point in body frame			0.0
EKF2_EV_POS_Y	Y position of VI sensor focal point in body frame			0.0
EKF2_EV_POS_Z	Z position of VI sensor focal point in body frame			0.0
EKF2_ARSP_THR	Airspeed fusion threshold. A value of zero will deactivate airspeed fusion. Any other positive value will determine the minimum airspeed which will still be fused	0.0		0.0
EKF2_TAU_VEL	Time constant of the velocity output prediction and smoothing filter		1.0	0.5

Name	Description	Min	Max	Default
	Comment			
EKF2_TAU_POS	Time constant of the position output prediction and smoothing filter. Controls how tightly the output track the EKF states	0.1	1.0	0.25
EKF2_GBIAS_INIT	1-sigma IMU gyro switch-on bias	0.0	0.2	0.1
EKF2_ABIAS_INIT	1-sigma IMU accelerometer switch-on bias	0.0	0.5	0.2
EKF2_ANGERR_INIT	1-sigma tilt angle uncertainty after gravity vector alignment	0.0	0.5	0.1

FW Attitude Control

Name	Description	Min	Max	Default
	Comment			
FW_R_TC	Attitude Roll Time Constant	0.4	1.0	0.4
	This defines the latency between a roll step input and the achieved setpoint (inverse to a P gain). Half a second is a good start value and fits for most average systems. Smaller systems may require smaller values, but as this will wear out servos faster, the value should only be decreased as needed.			
FW_P_TC	Attitude Pitch Time Constant	0.2	1.0	0.4
	This defines the latency between a pitch step input and the achieved setpoint (inverse to a P gain). Half a second is a good start value and fits for most average systems. Smaller systems may require smaller values, but as this will wear out servos faster, the value should only be decreased as needed.			
FW_PR_P	Pitch rate proportional gain	0.005	1.0	0.08
	This defines how much the elevator input will be commanded depending on the current body angular rate error.			
FW_PR_I	Pitch rate integrator gain	0.005	0.5	0.02
	This gain defines how much control response will result out of a steady state error. It trims any constant error.			
FW_P_RMAX_POS	Maximum positive / up pitch rate	0.0	90.0	60.0
	This limits the maximum pitch up angular rate the controller will output (in degrees per second). Setting a value of zero disables the limit.			

Name	Description	Min	Max	Default
	Comment			
FW_P_RMAX_NEG	Maximum negative / down pitch rate	0.0	90.0	60.0
	This limits the maximum pitch down up angular rate the controller will output (in degrees per second). Setting a value of zero disables the limit.			
FW_PR_IMAX	Pitch rate integrator limit	0.0	1.0	0.4
	The portion of the integrator part in the control surface deflection is limited to this value			
FW_RR_P	Roll rate proportional Gain	0.005	1.0	0.05
	This defines how much the aileron input will be commanded depending on the current body angular rate error.			
FW_RR_I	Roll rate integrator Gain	0.005	0.2	0.01
	This gain defines how much control response will result out of a steady state error. It trims any constant error.			
FW_RR_IMAX	Roll Integrator Anti-Windup	0.0	1.0	0.2
	The portion of the integrator part in the control surface deflection is limited to this value.			
FW_R_RMAX	Maximum Roll Rate	0.0	90.0	70.0
	This limits the maximum roll rate the controller will output (in degrees per second). Setting a value of zero disables the limit.			
FW_YR_P	Yaw rate proportional gain	0.005	1.0	0.05
	This defines how much the rudder input will be commanded depending on the current body angular rate error.			
FW_YR_I	Yaw rate integrator gain	0.0	50.0	0.0
	This gain defines how much control response will result out of a steady state error. It trims any constant error.			
FW_YR_IMAX	Yaw rate integrator limit	0.0	1.0	0.2

Name	Description	Min	Max	Default
	Comment			
	The portion of the integrator part in the control surface deflection is limited to this value			
FW_Y_RMAX	Maximum Yaw Rate	0.0	90.0	0.0
	This limits the maximum yaw rate the controller will output (in degrees per second). Setting a value of zero disables the limit.			
FW_WR_P	Wheel steering rate proportional gain	0.005	1.0	0.5
	This defines how much the wheel steering input will be commanded depending on the current body angular rate error.			
FW_WR_I	Wheel steering rate integrator gain	0.005	0.5	0.1
	This gain defines how much control response will result out of a steady state error. It trims any constant error.			
FW_WR_IMAX	Wheel steering rate integrator limit	0.0	1.0	1.0
	The portion of the integrator part in the control surface deflection is limited to this value			
FW_W_RMAX	Maximum wheel steering rate	0.0	90.0	0.0
	This limits the maximum wheel steering rate the controller will output (in degrees per second). Setting a value of zero disables the limit.			
FW_RR_FF	Roll rate feed forward	0.0	10.0	0.5
	Direct feed forward from rate setpoint to control surface output. Use this to obtain a tigher response of the controller without introducing noise amplification.			
FW_PR_FF	Pitch rate feed forward	0.0	10.0	0.5
	Direct feed forward from rate setpoint to control surface output			
FW_YR_FF	Yaw rate feed forward	0.0	10.0	0.3
	Direct feed forward from rate setpoint to control surface output			
FW_WR_FF	Wheel steering rate feed forward	0.0	10.0	0.2

Name	Description	Min	Max	Default
	Comment			
	Direct feed forward from rate setpoint to control surface output			
FW_YCO_VMIN	Minimal speed for yaw coordination	0.0	1000.0	1000.0
	For airspeeds above this value, the yaw rate is calculated for a coordinated turn. Set to a very high value to disable.			
FW_YCO_METHOD	Method used for yaw coordination	0	1	0
	The param value sets the method used to calculate the yaw rate 0: open-loop zero lateral acceleration based on kinematic constraints 1: closed-loop: try to reduce lateral acceleration to 0 by measuring the acceleration			
FW_RSP_OFF	Roll Setpoint Offset	-90.0	90.0	0.0
	An airframe specific offset of the roll setpoint in degrees, the value is added to the roll setpoint and should correspond to the typical cruise speed of the airframe.			
FW_PSP_OFF	Pitch Setpoint Offset	-90.0	90.0	0.0
	An airframe specific offset of the pitch setpoint in degrees, the value is added to the pitch setpoint and should correspond to the typical cruise speed of the airframe.			
FW_MAN_R_MAX	Max Manual Roll	0.0	90.0	45.0
	Max roll for manual control in attitude stabilized mode			
FW_MAN_P_MAX	Max Manual Pitch	0.0	90.0	45.0
	Max pitch for manual control in attitude stabilized mode			
FW_FLAPS_SCL	Scale factor for flaps	0.0	1.0	1.0
FW_FLAPERON_SCL	Scale factor for flaperons	0.0	1.0	0.0
FW_ARSP_MODE	Airspeed mode	0	2	0
	The param value sets the method used to publish the control state airspeed. For small wings or VTOL without airspeed sensor this parameter can be used to enable flying without an airspeed reading			

FW L1 Control

Name	Description	Min	Max	Default
	Comment			
FW_L1_PERIOD	L1 period	12.0	50.0	20.0
	This is the L1 distance and defines the tracking point ahead of the aircraft its following. A value of 18-25 meters works for most aircraft. Shorten slowly during tuning until response is sharp without oscillation.			
FW_L1_DAMPING	L1 damping	0.6	0.9	0.75
	Damping factor for L1 control.			
FW_THR_CRUISE	Cruise throttle	0.0	1.0	0.6
	This is the throttle setting required to achieve the desired cruise speed. Most airframes have a value of 0.5-0.7.			
FW_THR_SLEW_MAX	Throttle max slew rate	0.0	1.0	0.0
	Maximum slew rate for the commanded throttle			
FW_P_LIM_MIN	Negative pitch limit	-60.0	0.0	-45.0
	The minimum negative pitch the controller will output.			
FW_P_LIM_MAX	Positive pitch limit	0.0	60.0	45.0
	The maximum positive pitch the controller will output.			
FW_R_LIM	Controller roll limit	35.0	65.0	50.0
	The maximum roll the controller will output.			
FW_THR_MAX	Throttle limit max	0.0	1.0	1.0
	This is the maximum throttle % that can be used by the controller. For overpowered aircraft, this should be reduced to a value that provides sufficient thrust to climb at the maximum pitch angle PTCH_MAX.			
FW_THR_MIN	Throttle limit min	0.0	1.0	0.0

Name	Description	Min	Max	Default
	Comment			
	This is the minimum throttle % that can be used by the controller. For electric aircraft this will normally be set to zero, but can be set to a small non-zero value if a folding prop is fitted to prevent the prop from folding and unfolding repeatedly in-flight or to provide some aerodynamic drag from a turning prop to improve the descent rate. For aircraft with internal combustion engine this parameter should be set for desired idle rpm.			
FW_THR_IDLE	Idle throttle	0.0	0.4	0.15
	This is the minimum throttle while on the ground For aircraft with internal combustion engine this parameter should be set above desired idle rpm.			
FW_THR_LND_MAX	Throttle limit value before flare	0.0	1.0	1.0
	This throttle value will be set as throttle limit at FW_LND_TLALT, before aircraft will flare.			
FW_CLMBOUT_DIFF	Climbout Altitude difference	0.0	150.0	10.0
	If the altitude error exceeds this parameter, the system will climb out with maximum throttle and minimum airspeed until it is closer than this distance to the desired altitude. Mostly used for takeoff waypoints / modes. Set to 0 to disable climbout mode (not recommended).			
FW_LND_ANG	Landing slope angle	1.0	15.0	5.0
FW_LND_HVIRT		1.0	15.0	10.0
FW_LND_FLALT	Landing flare altitude (relative to landing altitude)	0.0	25.0	8.0
FW_LND_TLALT	Landing throttle limit altitude (relative landing altitude)	-1.0	30.0	-1.0
	Default of -1.0 lets the system default to applying throttle limiting at 2/3 of the flare altitude.			
FW_LND_HHDIST	Landing heading hold horizontal distance	0	30.0	15.0
FW_LND_USETER	Use terrain estimate during landing			0
FW_LND_FL_PMIN	Flare, minimum pitch	0	15.0	2.5

Name	Description	Min	Max	Default
	Comment			
	Minimum pitch during flare, a positive sign means nose up Applied once FW_LND_TLALT is reached			
FW_LND_FL_PMAX	Flare, maximum pitch	0	45.0	15.0
	Maximum pitch during flare, a positive sign means nose up Applied once FW_LND_TLALT is reached			
FW_LND_AIRSPD_SC	Min. airspeed scaling factor for landing	1.0	1.5	1.3
	Multiplying this factor with the minimum airspeed of the plane gives the target airspeed the landing approach. FW_AIRSPD_MIN * FW_LND_AIRSPD_SC			

FW TECS

Name	Description	Min	Max	Default
	Comment			
FW_AIRSPD_MIN	Minimum Airspeed	0.0	40	10.0
	If the airspeed falls below this value, the TECS controller will try to increase airspeed more aggressively.			
FW_AIRSPD_MAX	Maximum Airspeed	0.0	40	20.0
	If the airspeed is above this value, the TECS controller will try to decrease airspeed more aggressively.			
FW_T_CLMB_MAX	Maximum climb rate	1.0	15.0	5.0
	This is the best climb rate that the aircraft can achieve with the throttle set to THR_MAX and the airspeed set to the default value. For electric aircraft make sure this number can be achieved towards the end of flight when the battery voltage has reduced. The setting of this parameter can be checked by commanding a positive altitude change of 100m in loiter, RTL or guided mode. If the throttle required to climb is close to THR_MAX and the aircraft is maintaining airspeed, then this parameter is set correctly. If the airspeed starts to reduce, then the parameter is set to high, and if the throttle demand required to climb and maintain speed is noticeably less than FW_THR_MAX, then either FW_T_CLMB_MAX should be increased or FW_THR_MAX reduced.			
FW_T_SINK_MIN	Minimum descent rate	1.0	5.0	2.0

Name	Description	Min	Max	Default
	Comment			
	This is the sink rate of the aircraft with the throttle set to THR_MIN and flown at the same airspeed as used to measure FW_T_CLMB_MAX.			
FW_T_SINK_MAX	Maximum descent rate	2.0	15.0	5.0
	This sets the maximum descent rate that the controller will use. If this value is too large, the aircraft can over-speed on descent. This should be set to a value that can be achieved without exceeding the lower pitch angle limit and without over-speeding the aircraft.			
FW_T_TIME_CONST	TECS time constant	1.0	10.0	5.0
	This is the time constant of the TECS control algorithm (in seconds). Smaller values make it faster to respond, larger values make it slower to respond.			
FW_T_THRO_CONST	TECS Throttle time constant	1.0	10.0	8.0
	This is the time constant of the TECS throttle control algorithm (in seconds). Smaller values make it faster to respond, larger values make it slower to respond.			
FW_T_THR_DAMP	Throttle damping factor	0.0	2.0	0.5
	This is the damping gain for the throttle demand loop. Increase to add damping to correct for oscillations in speed and height.			
FW_T_INTEG_GAIN	Integrator gain	0.0	2.0	0.1
	This is the integrator gain on the control loop. Increasing this gain increases the speed at which speed and height offsets are trimmed out, but reduces damping and increases overshoot.			
FW_T_VERT_ACC	Maximum vertical acceleration	1.0	10.0	7.0
	This is the maximum vertical acceleration (in m/s/s) either up or down that the controller will use to correct speed or height errors. The default value of 7 m/s/s (equivalent to +- 0.7 g) allows for reasonably aggressive pitch changes if required to recover from under-speed conditions.			
FW_T_HGT_OMEGA	Complementary filter “omega” parameter for height	1.0	10.0	3.0

Name	Description	Min	Max	Default
	Comment			
	This is the cross-over frequency (in radians/second) of the complementary filter used to fuse vertical acceleration and barometric height to obtain an estimate of height rate and height. Increasing this frequency weights the solution more towards use of the barometer, whilst reducing it weights the solution more towards use of the accelerometer data.			
FW_T_SPD_OMEGA	Complementary filter “omega” parameter for speed	1.0	10.0	2.0
	This is the cross-over frequency (in radians/second) of the complementary filter used to fuse longitudinal acceleration and airspeed to obtain an improved airspeed estimate. Increasing this frequency weights the solution more towards use of the airspeed sensor, whilst reducing it weights the solution more towards use of the accelerometer data.			
FW_T_RLL2THR	Roll → Throttle feedforward	0.0	20.0	15.0
	Increasing this gain turn increases the amount of throttle that will be used to compensate for the additional drag created by turning. Ideally this should be set to approximately 10 x the extra sink rate in m/s created by a 45 degree bank turn. Increase this gain if the aircraft initially loses energy in turns and reduce if the aircraft initially gains energy in turns. Efficient high aspect-ratio aircraft (eg powered sailplanes) can use a lower value, whereas inefficient low aspect-ratio models (eg delta wings) can use a higher value.			
FW_T_SPDWEIGHT	Speed ← → Altitude priority	0.0	2.0	1.0
	This parameter adjusts the amount of weighting that the pitch control applies to speed vs height errors. Setting it to 0.0 will cause the pitch control to control height and ignore speed errors. This will normally improve height accuracy but give larger airspeed errors. Setting it to 2.0 will cause the pitch control loop to control speed and ignore height errors. This will normally reduce airspeed errors, but give larger height errors. The default value of 1.0 allows the pitch control to simultaneously control height and speed. Note to Glider Pilots - set this parameter to 2.0 (The glider will adjust its pitch angle to maintain airspeed, ignoring changes in height).			
FW_T_PTCH_DAMP	Pitch damping factor	0.0	2.0	0.0
	This is the damping gain for the pitch demand loop. Increase to add damping to correct for oscillations in height. The default value of 0.0 will work well provided the pitch to servo controller has been tuned properly.			
FW_T_HRATE_P	Height rate P factor	0.0	2.0	0.05
FW_T_HRATE_FF	Height rate FF factor	0.0	2.0	0.0

Name	Description	Min	Max	Default
	Comment			
FW_T_SRATE_P	Speed rate P factor	0.0	2.0	0.02
FW_AIRSPD_TRIM	Cruise Airspeed	0.0	40	15.0
	The fixed wing controller tries to fly at this airspeed.			

Follow target

Name	Description	Min	Max	Default
	Comment			
NAV_MIN_FT_HT	Minimum follow target altitude	8.0		8.0
	The minimum height in meters relative to home for following a target			
NAV_FT_DST	Distance to follow target from	1.0		8.0
	The distance in meters to follow the target at			
NAV_FT_FS	Side to follow target from	0	3	1
	The side to follow the target from (front right = 0, behind = 1, front = 2, front left = 3)			
NAV_FT_RS	Dynamic filtering algorithm responsiveness to target movement lower numbers increase the responsiveness to changing long lat but also ignore less noise	0.0	1.0	0.5

GPS

Name	Description	Min	Max	Default
	Comment			
GPS_DUMP_COMM	Dump GPS communication to a file	0	1	0
	If this is set to 1, all GPS communication data will be written to a file. Two files will be created, for reading and writing. All communication from startup until device disarm will be dumped.			

GPS Failure Navigation

Name	Description	Min	Max	Default
	Comment			
NAV_GPSF_LT	Loiter time	0.0	3600.0	30.0
	The amount of time in seconds the system should do open loop loiter and wait for gps recovery before it goes into flight termination.			
NAV_GPSF_R	Open loop loiter roll	0.0	30.0	15.0
	Roll in degrees during the open loop loiter			
NAV_GPSF_P	Open loop loiter pitch	-30.0	30.0	0.0
	Pitch in degrees during the open loop loiter			
NAV_GPSF_TR	Open loop loiter thrust	0.0	1.0	0.7
	Thrust value which is set during the open loop loiter			

Geofence

Name	Description	Min	Max	Default
	Comment			
GF_ACTION	Geofence violation action	0	4	1
	Note: Setting this value to 4 enables flight termination, which will kill the vehicle on violation of the fence. Due to the inherent danger of this, this function is disabled using a software circuit breaker, which needs to be reset to 0 to really shut down the system.			
GF_ALTMODE	Geofence altitude mode	0	1	0
	Select which altitude reference should be used 0 = WGS84, 1 = AMSL			
GF_SOURCE	Geofence source	0	1	0
	Select which position source should be used. Selecting GPS instead of global position makes sure that there is no dependence on the position estimator 0 = global position, 1 = GPS			
GF_COUNT	Geofence counter limit	-1	10	-1
	Set how many subsequent position measurements outside of the fence are needed before geofence violation is triggered			

Name	Description	Min	Max	Default
GF_MAX_HOR_DIST	Max horizontal distance in meters	-1	5000	-1
	Comment			
	Set to > 0 to activate a geofence action if horizontal distance to home exceeds this value.			
GF_MAX_VER_DIST	Max vertical distance in meters	-1		-1
	Set to > 0 to activate a geofence action if vertical distance to home exceeds this value.			

Gimbal

Name	Description	Min	Max	Default
	Comment			
GMB_USE_MNT	Consider mount operation mode			0
	If set to 1, mount mode will be enforced.			
GMB_AUX_MNT_CHN	Auxiliary switch to set mount operation mode	0	3	0
	Set to 0 to disable manual mode control. If set to an auxiliary switch: Switch off means the gimbal is put into safe/locked position. Switch on means the gimbal can move freely, and landing gear will be retracted if applicable.			

Land Detector

Name	Description	Min	Max	Default
	Comment			
LNDMC_Z_VEL_MAX	Multicopter max climb rate			0.70
	Maximum vertical velocity allowed in the landed state (m/s up and down)			
LNDMC_XY_VEL_MAX	Multicopter max horizontal velocity			1.50
	Maximum horizontal velocity allowed in the landed state (m/s)			
LNDMC_ROT_MAX	Multicopter max rotation			20.0
	Maximum allowed angular velocity around each axis allowed in the landed state.			
LNDMC_FFALL_THR	Multicopter specific force threshold	0.1	10	2.0

Name	Description	Min	Max	Default
	Comment			
	Multicopter threshold on the specific force measured by accelerometers in m/s^2 for free-fall detection			
LNDMC_FFALL_TTRI	Multicopter free-fall trigger time	0.02	5	0.3
	Seconds (decimal) that freefall conditions have to met before triggering a freefall. Minimal value is limited by LAND_DETECTOR_UPDATE_RATE=50Hz in landDetector.h			
LNDFW_VEL_XY_MAX	Fixedwing max horizontal velocity	0.5	10	5.0
	Maximum horizontal velocity allowed in the landed state (m/s)			
LNDFW_VEL_Z_MAX	Fixedwing max climb rate	5	20	10.0
	Maximum vertical velocity allowed in the landed state (m/s up and down)			
LNDFW_VELI_MAX	Fixedwing max short-term velocity	2	10	4.0
	Maximum velocity integral in flight direction allowed in the landed state (m/s)			
LNDFW_AIRSPD_MAX	Airspeed max	4	20	8.00
	Maximum airspeed allowed in the landed state (m/s)			

Launch detection

Name	Description	Min	Max	Default
	Comment			
LAUN_ALL_ON	Launch detection			0
LAUN_CAT_A	Catapult accelerometer threshold	0		30.0
	LAUN_CAT_A for LAUN_CAT_T serves as threshold to trigger launch detection.			
LAUN_CAT_T	Catapult time threshold	0.0	5.0	0.05
	LAUN_CAT_A for LAUN_CAT_T serves as threshold to trigger launch detection.			

Name	Description	Min	Max	Default
	Comment			
LAUN_CAT_MDEL	Motor delay	0.0	10.0	0.0
	Delay between starting attitude control and powering up the throttle (giving throttle control to the controller) Before this timespan is up the throttle will be set to FW_THR_IDLE, set to 0 to deactivate			
LAUN_CAT_PMAX	Maximum pitch before the throttle is powered up (during motor delay phase)	0.0	45.0	30.0
	This is an extra limit for the maximum pitch which is imposed in the phase before the throttle turns on. This allows to limit the maximum pitch angle during a bungee launch (make the launch less steep).			

Local Position Estimator

Name	Description	Min	Max	Default
	Comment			
LPE_INTEGRATE	Accelerometer integration for prediction			1
LPE_FLW_OFF_Z	Optical flow z offset from center	-1	1	0.0
LPE_FLW_XY	Optical flow xy standard deviation	0.01	1	0.01
LPE_FLW_QMIN	Optical flow minimum quality threshold	0	255	75
LPE_SNR_Z	Sonar z standard deviation	0.01	1	0.05
LPE_SNR_OFF_Z	Sonar z offset from center of vehicle +down	-1	1	0.00
LPE_LDR_Z	Lidar z standard deviation	0.01	1	0.03
LPE_LDR_OFF_Z	Lidar z offset from center of vehicle +down	-1	1	0.00
LPE_ACC_XY	Accelerometer xy standard deviation	0.00001	2	0.0454
	Data sheet sqrt(Noise power) = 150ug/sqrt(Hz) std dev = (150*9.8*1e-6)*sqrt(1000 Hz) m/s^2 Since accels sampled at 1000 Hz. should be 0.0464			
LPE_ACC_Z	Accelerometer z standard deviation	0.00001	2	0.0454
	(see Accel x comments)			
LPE_BAR_Z	Barometric presssure altitude z standard deviation	0.01	3	3.0

Name	Description	Min	Max	Default
	Comment			
LPE_GPS_ON	Enables GPS data, also forces alt init with GPS			1
LPE_GPS_DELAY	GPS delay compensaton	0	0.4	0.25
LPE_GPS_XY	GPS xy standard deviation	0.01	5	2.0
LPE_GPS_Z	GPS z standard deviation	0.01	200	100.0
LPE_GPS_VXY	GPS xy velocity standard deviation	0.01	2	0.25
LPE_GPS_VZ	GPS z velocity standard deviation	0.01	2	0.25
LPE_EPH_MAX	GPS max eph	1.0	5.0	3.0
LPE_EPV_MAX	GPS max epv	1.0	5.0	5.0
LPE_VIS_XY	Vision xy standard deviation	0.01	1	0.5
LPE_VIS_Z	Vision z standard deviation	0.01	2	0.5
LPE_VIS_ON	Vision correction			1
LPE_VIC_P	Vicon position standard deviation	0.01	1	0.05
LPE_PN_P	Position propagation noise density	0	1	0.0
LPE_PN_V	Velocity propagation noise density	0	1	0.0
LPE_PN_B	Accel bias propagation noise density	0	1	1e-3
LPE_PN_T	Terrain random walk noise density, hilly/outdoor (1e-1), flat/Indoor (1e-3)	0	1	1e-1
LPE_FGYRO_HP	Flow gyro high pass filter cut off frequency	0	2	0.1
LPE_LAT	Home latitude for nav w/o GPS	-90	90	40.430
LPE_LON	Home longitude for nav w/o GPS	-180	180	-86.929

MAVLink

Name	Description	Min	Max	Default
	Comment			
MAV_SYS_ID	MAVLink system ID	1	250	1
MAV_COMP_ID	MAVLink component ID	1	250	1
MAV_PROTO_VER	MAVLink protocol version			1

Name	Description	Min	Max	Default
	Comment			
MAV_RADIO_ID	MAVLink Radio ID	-1	240	0
	When non-zero the MAVLink app will attempt to configure the radio to this ID and re-set the parameter to 0. If the value is negative it will reset the complete radio config to factory defaults.			
MAV_TYPE	MAVLink airframe type	1		2
MAV_USEHILGPS	Use/Accept HIL GPS message even if not in HIL mode			0
	If set to 1 incoming HIL GPS messages are parsed.			
MAV_FWDEXTSP	Forward external setpoint messages			1
	If set to 1 incoming external setpoint messages will be directly forwarded to the controllers if in offboard control mode			
MAV_BROADCAST	Broadcast heartbeats on local network			0
	This allows a ground control station to automatically find the drone on the local network.			
MAV_TEST_PAR	Test parameter	-1000	1000	1
	This parameter is not actively used by the system. Its purpose is to allow testing the parameter interface on the communication level.			

MKBLCTRL Testmode

Name	Description	Min	Max	Default
	Comment			
MKBLCTRL_TEST	Test mode (Identify) of MKBLCTRL Driver			0

MPU9x50 Configuration

Name	Description	Min	Max	Default
	Comment			
MPU_GYRO_LPF_ENM	Low pass filter frequency for Gyro			4
MPU_ACC_LPF_ENM	Low pass filter frequency for Accelerometer			4

Name	Description	Min	Max	Default
	Comment			
MPU_SAMPLE_R_ENM	Sample rate in Hz			2

Mission

Name	Description	Min	Max	Default
	Comment			
COM_OBL_ACT	Set offboard loss failsafe mode			0
	The offboard loss failsafe will only be entered after a timeout, set by COM_OF_LOSS_T in seconds.			
COM_OBL_RC_ACT	Set offboard loss failsafe mode when RC is available			0
	The offboard loss failsafe will only be entered after a timeout, set by COM_OF_LOSS_T in seconds.			
MIS_TAKEOFF_ALT	Take-off altitude	0	80	10.0
	This is the minimum altitude the system will take off to.			
MIS_LTRMIN_ALT	Minimum Loiter altitude	0	80	1.2
	This is the minimum altitude the system will always obey. The intent is to stay out of ground effect.			
MIS_ONBOARD_EN	Persistent onboard mission storage			1
	When enabled, missions that have been uploaded by the GCS are stored and reloaded after reboot persistently.			
MIS_DIST_1WP	Maximal horizontal distance from home to first waypoint	0	1000	900
	Failsafe check to prevent running mission stored from previous flight at a new takeoff location. Set a value of zero or less to disable. The mission will not be started if the current waypoint is more distant than MIS_DIS_1WP from the current position.			
MIS_ALTMODE	Altitude setpoint mode	0	1	1

Name	Description	Min	Max	Default
	Comment			
	0: the system will follow a zero order hold altitude setpoint 1: the system will follow a first order hold altitude setpoint values follow the definition in enum mission_altitude_mode			
MIS_YAWMODE	Multirotor only. Yaw setpoint mode	0	3	1
	The values are defined in the enum mission_altitude_mode			
MIS_YAW_TMT	Time in seconds we wait on reaching target heading at a waypoint if it is forced	-1	20	-1.0
	If set > 0 it will ignore the target heading for normal waypoint acceptance. If the waypoint forces the heading the timeout will matter. For example on VTOL forwards transiton. Mainly useful for VTOLs that have less yaw authority and might not reach target yaw in wind. Disabled by default.			
MIS_YAW_ERR	Max yaw error in degrees needed for waypoint heading acceptance	0	90	12.0
VT_WV_LND_EN	Weather-vane mode landings for missions			0
VT_WV_LTR_EN	Weather-vane mode for loiter mode			0
NAV_LOITER_RAD	Loiter radius (FW only)	25	1000	50.0
	Default value of loiter radius for missions, loiter, RTL, etc. (fixedwing only).			
NAV_ACC_RAD	Acceptance Radius	0.05	200.0	10.0
	Default acceptance radius, overridden by acceptance radius of waypoint if set.			
NAV_DLL_ACT	Set data link loss failsafe mode			0
	The data link loss failsafe will only be entered after a timeout, set by COM_DL_LOSS_T in seconds. Once the timeout occurs the selected action will be executed. Setting this parameter to 4 will enable CASA Outback Challenge rules, which are only recommended to participants of that competition.			
NAV_RCL_ACT	Set RC loss failsafe mode			2

Name	Description	Min	Max	Default
	Comment			
	The RC loss failsafe will only be entered after a timeout, set by COM_RC_LOSS_T in seconds. If RC input checks have been disabled by setting the COM_RC_IN_MODE param it will not be triggered. Setting this parameter to 4 will enable CASA Outback Challenge rules, which are only recommended to participants of that competition.			

Multicopter Attitude Contr ol

Name	Description	Min	Max	Default
	Comment			
MC_ROLL_TC	Roll time constant	0.15	0.25	0.2
	Reduce if the system is too twitchy, increase if the response is too slow and sluggish.			
MC_PITCH_TC	Pitch time constant	0.15	0.25	0.2
	Reduce if the system is too twitchy, increase if the response is too slow and sluggish.			
MC_ROLL_P	Roll P gain	0.0	8	6.5
	Roll proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MC_ROLLRATE_P	Roll rate P gain	0.0	0.5	0.15
	Roll rate proportional gain, i.e. control output for angular speed error 1 rad/s.			
MC_ROLLRATE_I	Roll rate I gain	0.0		0.05
	Roll rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MC_ROLLRATE_D	Roll rate D gain	0.0	0.01	0.003
	Roll rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MC_ROLLRATE_FF	Roll rate feedforward	0.0		0.0
	Improves tracking performance.			

Name	Description	Min	Max	Default
	Comment			
MC_PITCH_P	Pitch P gain	0.0	10	6.5
	Pitch proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MC_PITCHRATE_P	Pitch rate P gain	0.0	0.6	0.15
	Pitch rate proportional gain, i.e. control output for angular speed error 1 rad/s.			
MC_PITCHRATE_I	Pitch rate I gain	0.0		0.05
	Pitch rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MC_PITCHRATE_D	Pitch rate D gain	0.0		0.003
	Pitch rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MC_PITCHRATE_FF	Pitch rate feedforward	0.0		0.0
	Improves tracking performance.			
MC_YAW_P	Yaw P gain	0.0	5	2.8
	Yaw proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MC_YAWRATE_P	Yaw rate P gain	0.0	0.6	0.2
	Yaw rate proportional gain, i.e. control output for angular speed error 1 rad/s.			
MC_YAWRATE_I	Yaw rate I gain	0.0		0.1
	Yaw rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MC_YAWRATE_D	Yaw rate D gain	0.0		0.0
	Yaw rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MC_YAWRATE_FF	Yaw rate feedforward	0.0		0.0

Name	Description	Min	Max	Default
	Comment			
	Improves tracking performance.			
MC_YAW_FF	Yaw feed forward	0.0	1.0	0.5
	Feed forward weight for manual yaw control. 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			
MC_ROLLRATE_MAX	Max roll rate	0.0	360.0	220.0
	Limit for roll rate, has effect for large rotations in autonomous mode, to avoid large control output and mixer saturation.			
MC_PITCHRATE_MAX	Max pitch rate	0.0	360.0	220.0
	Limit for pitch rate, has effect for large rotations in autonomous mode, to avoid large control output and mixer saturation.			
MC_YAWRATE_MAX	Max yaw rate	0.0	360.0	200.0
	A value of significantly over 120 degrees per second can already lead to mixer saturation.			
MC_YAWRAUTO_MAX	Max yaw rate in auto mode	0.0	120.0	45.0
	Limit for yaw rate, has effect for large rotations in autonomous mode, to avoid large control output and mixer saturation. A value of significantly over 60 degrees per second can already lead to mixer saturation. A value of 30 degrees / second is recommended to avoid very audible twitches.			
MC_ACRO_R_MAX	Max acro roll rate	0.0	1000.0	360.0
MC_ACRO_P_MAX	Max acro pitch rate	0.0	1000.0	360.0
MC_ACRO_Y_MAX	Max acro yaw rate	0.0	1000.0	360.0
MC_RATT_TH	Threshold for Rattitude mode	0.0	1.0	1.0
	Manual input needed in order to override attitude control rate setpoints and instead pass manual stick inputs as rate setpoints			
MP_ROLL_P	Roll P gain	0.0		6.0

Name	Description	Min	Max	Default
	Comment			
	Roll proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MP_ROLLRATE_P	Roll rate P gain	0.0		0.1
	Roll rate proportional gain, i.e. control output for angular speed error 1 rad/s.			
MP_ROLLRATE_I	Roll rate I gain	0.0		0.0
	Roll rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MP_ROLLRATE_D	Roll rate D gain	0.0		0.002
	Roll rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MP_PITCH_P	Pitch P gain	0.0		6.0
	Pitch proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MP_PITCHRATE_P	Pitch rate P gain	0.0		0.1
	Pitch rate proportional gain, i.e. control output for angular speed error 1 rad/s.			
MP_PITCHRATE_I	Pitch rate I gain	0.0		0.0
	Pitch rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MP_PITCHRATE_D	Pitch rate D gain	0.0		0.002
	Pitch rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MP_YAW_P	Yaw P gain	0.0		2.0
	Yaw proportional gain, i.e. desired angular speed in rad/s for error 1 rad.			
MP_YAWRATE_P	Yaw rate P gain	0.0		0.3
	Yaw rate proportional gain, i.e. control output for angular speed error 1 rad/s.			

Name	Description	Min	Max	Default
	Comment			
MP_YAWRATE_I	Yaw rate I gain	0.0		0.0
	Yaw rate integral gain. Can be set to compensate static thrust difference or gravity center offset.			
MP_YAWRATE_D	Yaw rate D gain	0.0		0.0
	Yaw rate differential gain. Small values help reduce fast oscillations. If value is too big oscillations will appear again.			
MP_YAW_FF	Yaw feed forward	0.0	1.0	0.5
	Feed forward weight for manual yaw control. 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			
MP_YAWRATE_MAX	Max yaw rate	0.0	360.0	60.0
	Limit for yaw rate, has effect for large rotations in autonomous mode, to avoid large control output and mixer saturation.			
MP_ACRO_R_MAX	Max acro roll rate	0.0	360.0	35.0
MP_ACRO_P_MAX	Max acro pitch rate	0.0	360.0	35.0
MP_ACRO_Y_MAX	Max acro yaw rate	0.0		120.0
MPP_MAN_R_MAX	Max manual roll	0.0	90.0	35.0
MPP_MAN_P_MAX	Max manual pitch	0.0	90.0	35.0
MPP_MAN_Y_MAX	Max manual yaw rate	0.0		120.0

Multicopter Position Contr ol

Name	Description	Min	Max	Default
	Comment			
MPC_THR_MIN	Minimum thrust in auto thrust control	0.05	1.0	0.12
	It's recommended to set it > 0 to avoid free fall with zero thrust.			
MPC_THR_HOVER	Hover thrust	0.2	0.8	0.5

Name	Description	Min	Max	Default
	Comment			
	Vertical thrust required to hover. This value is mapped to center stick for manual throttle control. With this value set to the thrust required to hover, transition from manual to ALTCTL mode while hovering will occur with the throttle stick near center, which is then interpreted as (near) zero demand for vertical speed.			
MPC_ALTCTL_DZ	ALTCTL throttle curve breakpoint	0.0	0.2	0.1
	Halfwidth of deadband or reduced sensitivity center portion of curve. This is the halfwidth of the center region of the ALTCTL throttle curve. It extends from center-dz to center+dz.			
MPC_ALTCTL_DY	ALTCTL throttle curve breakpoint height	0.0	0.2	0.0
	Controls the slope of the reduced sensitivity region. This is the height of the ALTCTL throttle curve at center-dz and center+dz.			
MPC_THR_MAX	Maximum thrust in auto thrust control	0.0	0.95	0.9
	Limit max allowed thrust. Setting a value of one can put the system into actuator saturation as no spread between the motors is possible any more. A value of 0.8 - 0.9 is recommended.			
MPC_MANTHR_MIN	Minimum manual thrust	0.0	1.0	0.08
	Minimum vertical thrust. It's recommended to set it > 0 to avoid free fall with zero thrust.			
MPC_MANTHR_MAX	Maximum manual thrust	0.0	1.0	0.9
	Limit max allowed thrust. Setting a value of one can put the system into actuator saturation as no spread between the motors is possible any more. A value of 0.8 - 0.9 is recommended.			
MPC_Z_P	Proportional gain for vertical position error	0.0	1.5	1.0
MPC_Z_VEL_P	Proportional gain for vertical velocity error	0.1	0.4	0.2
MPC_Z_VEL_I	Integral gain for vertical velocity error	0.01	0.1	0.02
	Non zero value allows hovering thrust estimation on stabilized or autonomous takeoff.			
MPC_Z_VEL_D	Differential gain for vertical velocity error	0.0	0.1	0.0

Name	Description	Min	Max	Default
	Comment			
MPC_Z_VEL_MAX_UP	Maximum vertical ascent velocity	0.5	8.0	3.0
	Maximum vertical velocity in AUTO mode and endpoint for stabilized modes (ALTCTRL, POSCTRL).			
MPC_Z_VEL_MAX	Maximum vertical descent velocity	0.5	4.0	1.0
	Maximum vertical velocity in AUTO mode and endpoint for stabilized modes (ALTCTRL, POSCTRL).			
MPC_Z_VEL_MAX_DN	Transitional support, do not change / use	0.5	4.0	1.0
MPC_Z_FF	Vertical velocity feed forward	0.0	1.0	0.5
	Feed forward weight for altitude control in stabilized modes (ALTCTRL, POSCTRL). 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			
MPC_XY_P	Proportional gain for horizontal position error	0.0	2.0	1.25
MPC_XY_VEL_P	Proportional gain for horizontal velocity error	0.06	0.15	0.09
MPC_XY_VEL_I	Integral gain for horizontal velocity error	0.0	0.1	0.02
	Non-zero value allows to resist wind.			
MPC_XY_VEL_D	Differential gain for horizontal velocity error. Small values help reduce fast oscillations. If value is too big oscillations will appear again	0.005	0.1	0.01
MPC_XY_CRUISE	Nominal horizontal velocity	3.0	20.0	5.0
	Normal horizontal velocity in AUTO modes (includes also RTL / hold / etc.) and endpoint for position stabilized mode (POSCTRL).			
MPC_XY_VEL_MAX	Maximum horizontal velocity	0.0	20.0	8.0
	Maximum horizontal velocity in AUTO mode. If higher speeds are commanded in a mission they will be capped to this velocity.			
MPC_XY_FF	Horizontal velocity feed forward	0.0	1.0	0.5

Name	Description	Min	Max	Default
	Comment			
	Feed forward weight for position control in position control mode (POSCTRL). 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			
MPC_TILTMAX_AIR	Maximum tilt angle in air	0.0	90.0	45.0
	Limits maximum tilt in AUTO and POSCTRL modes during flight.			
MPC_TILTMAX_LND	Maximum tilt during landing	0.0	90.0	12.0
	Limits maximum tilt angle on landing.			
MPC_LAND_SPEED	Landing descend rate	0.2		0.5
MPC_TKO_SPEED	Takeoff climb rate	1	5	1.5
MPC_MAN_R_MAX	Max manual roll	0.0	90.0	35.0
MPC_MAN_P_MAX	Max manual pitch	0.0	90.0	35.0
MPC_MAN_Y_MAX	Max manual yaw rate	0.0	400	200.0
MPC_HOLD_XY_DZ	Deadzone of X,Y sticks where position hold is enabled	0.0	1.0	0.1
MPC_HOLD_MAX_XY	Maximum horizontal velocity for which position hold is enabled (use 0 to disable check)	0.0	3.0	0.8
MPC_HOLD_MAX_Z	Maximum vertical velocity for which position hold is enabled (use 0 to disable check)	0.0	3.0	0.6
MPC_VELD_LP	Low pass filter cut freq. for numerical velocity derivative	0.0	10	5.0
MPC_ACC_HOR_MAX	Maximum horizonal acceleration in velocity controlled modes	2.0	15.0	10.0
MPC_ALT_MODE	Altitude control mode, note mode 1 only tested with LPE	0	1	0
MPP_THR_MIN	Minimum thrust	0.0	1.0	0.1
	Minimum vertical thrust. It's recommended to set it > 0 to avoid free fall with zero thrust.			
MPP_THR_MAX	Maximum thrust	0.0	1.0	1.0

Name	Description	Min	Max	Default
	Comment			
	Limit max allowed thrust.			
MPP_Z_P	Proportional gain for vertical position error	0.0		1.0
MPP_Z_VEL_P	Proportional gain for vertical velocity error	0.0		0.1
MPP_Z_VEL_I	Integral gain for vertical velocity error	0.0		0.02
	Non zero value allows hovering thrust estimation on stabilized or autonomous takeoff.			
MPP_Z_VEL_D	Differential gain for vertical velocity error	0.0		0.0
MPP_Z_VEL_MAX	Maximum vertical velocity	0.0		5.0
	Maximum vertical velocity in AUTO mode and endpoint for stabilized modes (ALTCTRL).			
MPP_Z_FF	Vertical velocity feed forward	0.0	1.0	0.5
	Feed forward weight for altitude control in stabilized modes (ALTCTRL). 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			
MPP_XY_P	Proportional gain for horizontal position error	0.0		1.0
MPP_XY_VEL_P	Proportional gain for horizontal velocity error	0.0		0.1
MPP_XY_VEL_I	Integral gain for horizontal velocity error	0.0		0.02
	Non-zero value allows to resist wind.			
MPP_XY_VEL_D	Differential gain for horizontal velocity error. Small values help reduce fast oscillations. If value is too big oscillations will appear again	0.0		0.01
MPP_XY_VEL_MAX	Maximum horizontal velocity	0.0		5.0
	Maximum horizontal velocity in AUTO mode and endpoint for position stabilized mode (POSCTRL).			
MPP_XY_FF	Horizontal velocity feed forward	0.0	1.0	0.5
	Feed forward weight for position control in position control mode (POSCTRL). 0 will give slow responce and no overshot, 1 - fast responce and big overshot.			

Name	Description	Min	Max	Default
	Comment			
MPP_TILTMAX_AIR	Maximum tilt angle in air	0.0	90.0	45.0
	Limits maximum tilt in AUTO and POSCTRL modes during flight.			
MPP_TILTMAX_LND	Maximum tilt during landing	0.0	90.0	15.0
	Limits maximum tilt angle on landing.			
MPP_LAND_SPEED	Landing descend rate	0.0		1.0

PWM Outputs

Name	Description	Min	Max	Default
	Comment			
PWM_AUX_REV1	Invert direction of aux output channel 1			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_AUX_REV2	Invert direction of aux output channel 2			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_AUX_REV3	Invert direction of aux output channel 3			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_AUX_REV4	Invert direction of aux output channel 4			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_AUX_REV5	Invert direction of aux output channel 5			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_AUX_REV6	Invert direction of aux output channel 6			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV1	Invert direction of main output channel 1			0

Name	Description	Min	Max	Default
	Comment			
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV2	Invert direction of main output channel 2			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV3	Invert direction of main output channel 3			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV4	Invert direction of main output channel 4			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV5	Invert direction of main output channel 5			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV6	Invert direction of main output channel 6			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV7	Invert direction of main output channel 7			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_MAIN_REV8	Invert direction of main output channel 8			0
	Set to 1 to invert the channel, 0 for default direction.			
PWM_SBUS_MODE	S.BUS out			0
	Set to 1 to enable S.BUS version 1 output instead of RSSI.			
PWM_MIN	Set the minimum PWM for the MAIN outputs	800	1400	1000
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. Set to 1000 for industry default or 900 to increase servo travel.			
PWM_MAX	Set the maximum PWM for the MAIN outputs	1600	2200	2000

Name	Description	Min	Max	Default
	Comment			
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. Set to 2000 for industry default or 2100 to increase servo travel.			
PWM_DISARMED	Set the disarmed PWM for MAIN outputs	0	2200	0
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. This is the PWM pulse the autopilot is outputting if not armed. The main use of this parameter is to silence ESCs when they are disarmed.			
PWM_AUX_MIN	Set the minimum PWM for the MAIN outputs	800	1400	1000
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. Set to 1000 for default or 900 to increase servo travel			
PWM_AUX_MAX	Set the maximum PWM for the MAIN outputs	1600	2200	2000
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. Set to 2000 for default or 2100 to increase servo travel			
PWM_AUX_DISARMED	Set the disarmed PWM for AUX outputs	0	2200	1000
	IMPORTANT: CHANGING THIS PARAMETER REQUIRES A COMPLETE SYSTEM REBOOT IN ORDER TO APPLY THE CHANGES. COMPLETELY POWER-CYCLE THE SYSTEM TO PUT CHANGES INTO EFFECT. This is the PWM pulse the autopilot is outputting if not armed. The main use of this parameter is to silence ESCs when they are disarmed.			

Payload drop

Name	Description	Min	Max	Default
	Comment			
BD_GPROPERTIES	Ground drag property	0.001	0.1	0.03

Name	Description	Min	Max	Default
	Comment			
	This parameter encodes the ground drag coefficient and the corresponding decrease in wind speed from the plane altitude to ground altitude.			
BD_TURNRADIUS	Plane turn radius	30.0	500.0	120.0
	The planes known minimal turn radius - use a higher value to make the plane maneuver more distant from the actual drop position. This is to ensure the wings are level during the drop.			
BD_PRECISION	Drop precision	1.0	80.0	30.0
	If the system is closer than this distance on passing over the drop position, it will release the payload. This is a safeguard to prevent a drop out of the required accuracy.			
BD_OBJ_CD	Payload drag coefficient of the dropped object	0.08	1.5	0.1
	The drag coefficient (cd) is the typical drag constant for air. It is in general object specific, but the closest primitive shape to the actual object should give good results: http://en.wikipedia.org/wiki/Drag_coefficient (http://en.wikipedia.org/wiki/Drag_coefficient)			
BD_OBJ_MASS	Payload mass	0.001	5.0	0.6
	A typical small toy ball: 0.025 kg OBC water bottle: 0.6 kg			
BD_OBJ_SURFACE	Payload front surface area	0.001	0.5	0.00311724531
	A typical small toy ball: (0.045 * 0.045) / 4.0 * pi = 0.001590 m^2 OBC water bottle: (0.063 * 0.063) / 4.0 * pi = 0.003117 m^2			

Position Estimator

Name	Description	Min	Max	Default
	Comment			
PE_VEL_DELAY_MS	Velocity estimate delay	0	1000	230
	The delay in milliseconds of the velocity estimate from GPS.			
PE_POS_DELAY_MS	Position estimate delay	0	1000	210

Name	Description	Min	Max	Default
	Comment			
	The delay in milliseconds of the position estimate from GPS.			
PE_HGT_DELAY_MS	Height estimate delay	0	1000	350
	The delay in milliseconds of the height estimate from the barometer.			
PE_MAG_DELAY_MS	Mag estimate delay	0	1000	30
	The delay in milliseconds of the magnetic field estimate from the magnetometer.			
PE_TAS_DELAY_MS	True airspeeed estimate delay	0	1000	210
	The delay in milliseconds of the airspeed estimate.			
PE_GPS_ALT_WGT	GPS vs. barometric altitude update weight	0.0	1.0	0.9
	RE-CHECK this.			
PE_EAS_NOISE	Airspeed measurement noise	0.5	5.0	1.4
	Increasing this value will make the filter trust this sensor less and trust other sensors more.			
PE_VELNE_NOISE	Velocity measurement noise in north-east (horizontal) direction	0.05	5.0	0.3
	Generic default: 0.3, multicopters: 0.5, ground vehicles: 0.5			
PE_VELD_NOISE	Velocity noise in down (vertical) direction	0.2	3.0	0.3
	Generic default: 0.3, multicopters: 0.4, ground vehicles: 0.7			
PE_POSNE_NOISE	Position noise in north-east (horizontal) direction	0.1	10.0	0.5
	Generic defaults: 0.5, multicopters: 0.5, ground vehicles: 0.5			
PE_POSD_NOISE	Position noise in down (vertical) direction	0.5	3.0	1.25
	Generic defaults: 1.25, multicopters: 1.0, ground vehicles: 1.0			
PE_MAG_NOISE	Magnetometer measurement noise	0.01	1.0	0.05

Name	Description	Min	Max	Default
	Comment			
	Generic defaults: 0.05, multicopters: 0.05, ground vehicles: 0.05			
PE_GYRO_PNOISE	Gyro process noise	0.001	0.05	0.015
	Generic defaults: 0.015, multicopters: 0.015, ground vehicles: 0.015. This noise controls how much the filter trusts the gyro measurements. Increasing it makes the filter trust the gyro less and other sensors more.			
PE_ACC_PNOISE	Accelerometer process noise	0.05	1.0	0.125
	Generic defaults: 0.25, multicopters: 0.25, ground vehicles: 0.25. Increasing this value makes the filter trust the accelerometer less and other sensors more.			
PE_GBIAS_PNOISE	Gyro bias estimate process noise	0.00000005	0.00001	1e-07
	Generic defaults: 1e-07f, multicopters: 1e-07f, ground vehicles: 1e-07f. Increasing this value will make the gyro bias converge faster but noisier.			
PE_ABIAS_PNOISE	Accelerometer bias estimate process noise	0.00001	0.001	1e-05
	Generic defaults: 0.00001f, multicopters: 0.00001f, ground vehicles: 0.00001f. Increasing this value makes the bias estimation faster and noisier.			
PE_MAGE_PNOISE	Magnetometer earth frame offsets process noise	0.0001	0.01	0.0003
	Generic defaults: 0.0001, multicopters: 0.0001, ground vehicles: 0.0001. Increasing this value makes the magnetometer earth bias estimate converge faster but also noisier.			
PE_MAGB_PNOISE	Magnetometer body frame offsets process noise	0.0001	0.01	0.0003
	Generic defaults: 0.0003, multicopters: 0.0003, ground vehicles: 0.0003. Increasing this value makes the magnetometer body bias estimate converge faster but also noisier.			
PE_MAGB_X	Magnetometer X bias	-0.6	0.6	0.0
	The magnetometer bias. This bias is learnt by the filter over time and persists between boots.			
PE_MAGB_Y	Magnetometer Y bias	-0.6	0.6	0.0

Name	Description	Min	Max	Default
	Comment			
	The magnetometer bias. This bias is learnt by the filter over time and persists between boots.			
PE_MAGB_Z	Magnetometer Z bias	-0.6	0.6	0.0
	The magnetometer bias. This bias is learnt by the filter over time and persists between boots.			
PE_POSDEV_INIT	Threshold for filter initialization	0.3	10.0	5.0
	If the standard deviation of the GPS position estimate is below this threshold in meters, the filter will initialize.			

Position Estimator INAV

Name	Description	Min	Max	Default
	Comment			
INAV_W_Z_BARO	Z axis weight for barometer	0.0	10.0	0.5
	Weight (cutoff frequency) for barometer altitude measurements.			
INAV_W_Z_GPS_P	Z axis weight for GPS	0.0	10.0	0.005
	Weight (cutoff frequency) for GPS altitude measurements. GPS altitude data is very noisy and should be used only as slow correction for baro offset.			
INAV_W_Z_GPS_V	Z velocity weight for GPS	0.0	10.0	0.0
	Weight (cutoff frequency) for GPS altitude velocity measurements.			
INAV_W_Z_VIS_P	Z axis weight for vision	0.0	10.0	5.0
	Weight (cutoff frequency) for vision altitude measurements. vision altitude data is very noisy and should be used only as slow correction for baro offset.			
INAV_W_Z_LIDAR	Z axis weight for lidar	0.0	10.0	3.0
	Weight (cutoff frequency) for lidar measurements.			
INAV_W_XY_GPS_P	XY axis weight for GPS position	0.0	10.0	1.0

Name	Description	Min	Max	Default
	Comment			
	Weight (cutoff frequency) for GPS position measurements.			
INAV_W_XY_GPS_V	XY axis weight for GPS velocity	0.0	10.0	2.0
	Weight (cutoff frequency) for GPS velocity measurements.			
INAV_W_XY_VIS_P	XY axis weight for vision position	0.0	10.0	7.0
	Weight (cutoff frequency) for vision position measurements.			
INAV_W_XY_VIS_V	XY axis weight for vision velocity	0.0	10.0	0.0
	Weight (cutoff frequency) for vision velocity measurements.			
INAV_W_MOC_P	Weight for mocap system	0.0	10.0	10.0
	Weight (cutoff frequency) for mocap position measurements.			
INAV_W_XY_FLOW	XY axis weight for optical flow	0.0	10.0	0.8
	Weight (cutoff frequency) for optical flow (velocity) measurements.			
INAV_W_XY_RES_V	XY axis weight for resetting velocity	0.0	10.0	0.5
	When velocity sources lost slowly decrease estimated horizontal velocity with this weight.			
INAV_W_GPS_FLOW	XY axis weight factor for GPS when optical flow available	0.0	1.0	0.1
	When optical flow data available, multiply GPS weights (for position and velocity) by this factor.			
INAV_W_ACC_BIAS	Accelerometer bias estimation weight	0.0	0.1	0.05
	Weight (cutoff frequency) for accelerometer bias estimation. 0 to disable.			
INAV_FLOW_K	Optical flow scale factor	0.0	10.0	1.35
	Factor to scale optical flow			
INAV_FLOW_Q_MIN	Minimal acceptable optical flow quality	0.0	1.0	0.3

Name	Description	Min	Max	Default
	Comment			
	0 - lowest quality, 1 - best quality.			
INAV_LIDAR_ERR	Sonar maximal error for new surface	0.0	1.0	0.2
	If sonar measurement error is larger than this value it skiped (spike) or accepted as new surface level (if offset is stable).			
INAV_LAND_T	Land detector time	0.0	10.0	3.0
	Vehicle assumed landed if no altitude changes happened during this time on low throttle.			
INAV_LAND_DISP	Land detector altitude dispersion threshold	0.0	10.0	0.7
	Dispersion threshold for triggering land detector.			
INAV_LAND_THR	Land detector throttle threshold	0.0	1.0	0.2
	Value should be lower than minimal hovering thrust. Half of it is good choice.			
INAV_DELAY_GPS	GPS delay	0.0	1.0	0.2
	GPS delay compensation			
INAV_FLOW_DIST_X	Flow module offset (center of rotation) in X direction	-1.0	1.0	0.0
	Yaw X flow compensation			
INAV_FLOW_DIST_Y	Flow module offset (center of rotation) in Y direction	-1.0	1.0	0.0
	Yaw Y flow compensation			
INAV_DISAB_MOCAP	Mo-cap			0
	Set to 0 if using fake GPS			
INAV_LIDAR_EST	LIDAR for altitude estimation			0
INAV_LIDAR_OFF	LIDAR calibration offset	-20	20	0.0

Name	Description	Min	Max	Default
	Comment			
	LIDAR calibration offset. Value will be added to the measured distance			
CBRK_NO_VISION	Disable vision input	0	328754	0
	Set to the appropriate key (328754) to disable vision input.			

RC Receiver Configuration

Name	Description	Min	Max	Default
	Comment			
RC_RECEIVER_TYPE	RC receiver type			1
	Acceptable values: - RC_RECEIVER_SPEKTRUM = 1, - RC_RECEIVER_LEMONRX = 2,			

Radio Calibration

Name	Description	Min	Max	Default
	Comment			
TRIM_ROLL	Roll trim	-0.25	0.25	0.0
	The trim value is the actuator control value the system needs for straight and level flight. It can be calibrated by flying manually straight and level using the RC trims and copying them using the GCS.			
TRIM_PITCH	Pitch trim	-0.25	0.25	0.0
	The trim value is the actuator control value the system needs for straight and level flight. It can be calibrated by flying manually straight and level using the RC trims and copying them using the GCS.			
TRIM_YAW	Yaw trim	-0.25	0.25	0.0
	The trim value is the actuator control value the system needs for straight and level flight. It can be calibrated by flying manually straight and level using the RC trims and copying them using the GCS.			
RC1_MIN	RC Channel 1 Minimum	800.0	1500.0	1000.0

Name	Description	Min	Max	Default
	Comment			
	Minimum value for RC channel 1			
RC1_TRIM	RC Channel 1 Trim	800.0	2200.0	1500.0
	Mid point value (same as min for throttle)			
RC1_MAX	RC Channel 1 Maximum	1500.0	2200.0	2000.0
	Maximum value for RC channel 1			
RC1_REV	RC Channel 1 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC1_DZ	RC Channel 1 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC2_MIN	RC Channel 2 Minimum	800.0	1500.0	1000.0
	Minimum value for this channel.			
RC2_TRIM	RC Channel 2 Trim	800.0	2200.0	1500.0
	Mid point value (has to be set to the same as min for throttle channel).			
RC2_MAX	RC Channel 2 Maximum	1500.0	2200.0	2000.0
	Maximum value for this channel.			
RC2_REV	RC Channel 2 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC2_DZ	RC Channel 2 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC3_MIN	RC Channel 3 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			

Name	Description	Min	Max	Default
	Comment			
RC3_TRIM	RC Channel 3 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC3_MAX	RC Channel 3 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC3_REV	RC Channel 3 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC3_DZ	RC Channel 3 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC4_MIN	RC Channel 4 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC4_TRIM	RC Channel 4 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC4_MAX	RC Channel 4 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC4_REV	RC Channel 4 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC4_DZ	RC Channel 4 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC5_MIN	RC Channel 5 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC5_TRIM	RC Channel 5 Trim	800.0	2200.0	1500

Name	Description	Min	Max	Default
	Comment			
	Mid point value (has to be set to the same as min for throttle channel).			
RC5_MAX	RC Channel 5 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC5_REV	RC Channel 5 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC5_DZ	RC Channel 5 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC6_MIN	RC Channel 6 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC6_TRIM	RC Channel 6 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC6_MAX	RC Channel 6 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC6_REV	RC Channel 6 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC6_DZ	RC Channel 6 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC7_MIN	RC Channel 7 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC7_TRIM	RC Channel 7 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			

Name	Description	Min	Max	Default
	Comment			
RC7_MAX	RC Channel 7 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC7_REV	RC Channel 7 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC7_DZ	RC Channel 7 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC8_MIN	RC Channel 8 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC8_TRIM	RC Channel 8 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC8_MAX	RC Channel 8 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC8_REV	RC Channel 8 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC8_DZ	RC Channel 8 dead zone	0.0	100.0	10.0
	The +- range of this value around the trim value will be considered as zero.			
RC9_MIN	RC Channel 9 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC9_TRIM	RC Channel 9 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC9_MAX	RC Channel 9 Maximum	1500.0	2200.0	2000

Name	Description	Min	Max	Default
	Comment			
	Maximum value for this channel.			
RC9_REV	RC Channel 9 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC9_DZ	RC Channel 9 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC10_MIN	RC Channel 10 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC10_TRIM	RC Channel 10 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC10_MAX	RC Channel 10 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC10_REV	RC Channel 10 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC10_DZ	RC Channel 10 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC11_MIN	RC Channel 11 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC11_TRIM	RC Channel 11 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC11_MAX	RC Channel 11 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			

Name	Description	Min	Max	Default
	Comment			
RC11_REV	RC Channel 11 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC11_DZ	RC Channel 11 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC12_MIN	RC Channel 12 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC12_TRIM	RC Channel 12 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC12_MAX	RC Channel 12 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC12_REV	RC Channel 12 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC12_DZ	RC Channel 12 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC13_MIN	RC Channel 13 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC13_TRIM	RC Channel 13 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC13_MAX	RC Channel 13 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC13_REV	RC Channel 13 Reverse	-1.0	1.0	1.0

Name	Description	Min	Max	Default
	Comment			
	Set to -1 to reverse channel.			
RC13_DZ	RC Channel 13 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC14_MIN	RC Channel 14 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC14_TRIM	RC Channel 14 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC14_MAX	RC Channel 14 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC14_REV	RC Channel 14 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC14_DZ	RC Channel 14 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC15_MIN	RC Channel 15 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC15_TRIM	RC Channel 15 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC15_MAX	RC Channel 15 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC15_REV	RC Channel 15 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			

Name	Description	Min	Max	Default
	Comment			
RC15_DZ	RC Channel 15 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC16_MIN	RC Channel 16 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC16_TRIM	RC Channel 16 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC16_MAX	RC Channel 16 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC16_REV	RC Channel 16 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC16_DZ	RC Channel 16 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC17_MIN	RC Channel 17 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC17_TRIM	RC Channel 17 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC17_MAX	RC Channel 17 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC17_REV	RC Channel 17 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC17_DZ	RC Channel 17 dead zone	0.0	100.0	0.0

Name	Description	Min	Max	Default
	Comment			
	The +- range of this value around the trim value will be considered as zero.			
RC18_MIN	RC Channel 18 Minimum	800.0	1500.0	1000
	Minimum value for this channel.			
RC18_TRIM	RC Channel 18 Trim	800.0	2200.0	1500
	Mid point value (has to be set to the same as min for throttle channel).			
RC18_MAX	RC Channel 18 Maximum	1500.0	2200.0	2000
	Maximum value for this channel.			
RC18_REV	RC Channel 18 Reverse	-1.0	1.0	1.0
	Set to -1 to reverse channel.			
RC18_DZ	RC Channel 18 dead zone	0.0	100.0	0.0
	The +- range of this value around the trim value will be considered as zero.			
RC_RL1_DSM_VCC	Relay control of relay 1 mapped to the Spektrum receiver power supply	0	1	0
RC_DSM_BIND	DSM binding trigger	-1	1	-1
RC_CHAN_CNT	RC channel count	0	18	0
	This parameter is used by Ground Station software to save the number of channels which were used during RC calibration. It is only meant for ground station use.			
RC_TH_USER	RC mode switch threshold automatic distribution			1
	This parameter is used by Ground Station software to specify whether the threshold values for flight mode switches were automatically calculated. 0 indicates that the threshold values were set by the user. Any other value indicates that the threshold value where automatically set by the ground station software. It is only meant for ground station use.			
RC_MAP_ROLL	Roll control channel mapping	0	18	0

Name	Description	Min	Max	Default
	Comment			
	The channel index (starting from 1 for channel 1) indicates which channel should be used for reading roll inputs from. A value of zero indicates the switch is not assigned.			
RC_MAP_PITCH	Pitch control channel mapping	0	18	0
	The channel index (starting from 1 for channel 1) indicates which channel should be used for reading pitch inputs from. A value of zero indicates the switch is not assigned.			
RC_MAP_THROTTLE	Throttle control channel mapping	0	18	0
	The channel index (starting from 1 for channel 1) indicates which channel should be used for reading throttle inputs from. A value of zero indicates the switch is not assigned.			
RC_MAP_YAW	Yaw control channel mapping	0	18	0
	The channel index (starting from 1 for channel 1) indicates which channel should be used for reading yaw inputs from. A value of zero indicates the switch is not assigned.			
RC_MAP_AUX1	AUX1 Passthrough RC Channel	0	18	0
	Default function: Camera pitch			
RC_MAP_AUX2	AUX2 Passthrough RC Channel	0	18	0
	Default function: Camera roll			
RC_MAP_AUX3	AUX3 Passthrough RC Channel	0	18	0
	Default function: Camera azimuth / yaw			
RC_MAP_AUX4	AUX4 Passthrough RC Channel	0	18	0
RC_MAP_AUX5	AUX5 Passthrough RC Channel	0	18	0
RC_MAP_PARAM1	PARAM1 tuning channel	0	18	0
	Can be used for parameter tuning with the RC. This one is further referenced as the 1st parameter channel. Set to 0 to deactivate *			
RC_MAP_PARAM2	PARAM2 tuning channel	0	18	0

Name	Description	Min	Max	Default
	Comment			
	Can be used for parameter tuning with the RC. This one is further referenced as the 2nd parameter channel. Set to 0 to deactivate *			
RC_MAP_PARAM3	PARAM3 tuning channel	0	18	0
	Can be used for parameter tuning with the RC. This one is further referenced as the 3th parameter channel. Set to 0 to deactivate *			
RC_FAILS_THR	Failsafe channel PWM threshold	0	2200	0
	Set to a value slightly above the PWM value assumed by throttle in a failsafe event, but ensure it is below the PWM value assumed by throttle during normal operation.			
RC_RSSI_PWM_CHAN	PWM input channel that provides RSSI	0	18	0
	0: do not read RSSI from input channel 1-18: read RSSI from specified input channel Specify the range for RSSI input with RC_RSSI_PWM_MIN and RC_RSSI_PWM_MAX parameters.			
RC_RSSI_PWM_MAX	Max input value for RSSI reading	0	2000	1000
	Only used if RC_RSSI_PWM_CHAN > 0			
RC_RSSI_PWM_MIN	Min input value for RSSI reading	0	2000	2000
	Only used if RC_RSSI_PWM_CHAN > 0			

Radio Signal Loss

Name	Description	Min	Max	Default
	Comment			
NAV_RCL_LT	Loiter Time	-1.0		120.0
	The amount of time in seconds the system should loiter at current position before termination Set to -1 to make the system skip loitering			

Radio Switches

Name	Description	Min	Max	Default

Name	Description	Min	Max	Default
RC_MAP_FLTMODE	Single channel flight mode selection	0	18	0
	Comment			
	If this parameter is non-zero, flight modes are only selected by this channel and are assigned to six slots.			
RC_MAP_MODE_SW	Mode switch channel mapping	0	18	0
	This is the main flight mode selector. The channel index (starting from 1 for channel 1) indicates which channel should be used for deciding about the main mode. A value of zero indicates the switch is not assigned.			
RC_MAP_RETURN_SW	Return switch channel	0	18	0
RC_MAP_RATT_SW	Rattitude switch channel	0	18	0
RC_MAP_POSCTL_SW	Position Control switch channel	0	18	0
RC_MAP_LOITER_SW	Loiter switch channel	0	18	0
RC_MAP_ACRO_SW	Acro switch channel	0	18	0
RC_MAP_OFFB_SW	Offboard switch channel	0	18	0
RC_MAP_KILL_SW	Kill switch channel	0	18	0
RC_MAP_FLAPS	Flaps channel	0	18	0
RC_ASSIST_TH	Threshold for selecting assist mode	-1	1	0.25
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_AUTO_TH	Threshold for selecting auto mode	-1	1	0.75
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_RATT_TH	Threshold for selecting rattitude mode	-1	1	0.5
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_POSCTL_TH	Threshold for selecting posctl mode	-1	1	0.5

Name	Description	Min	Max	Default
	Comment			
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_RETURN_TH	Threshold for selecting return to launch mode	-1	1	0.5
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_LOITER_TH	Threshold for selecting loiter mode	-1	1	0.5
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_ACRO_TH	Threshold for selecting acro mode	-1	1	0.5
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_OFFB_TH	Threshold for selecting offboard mode	-1	1	0.5
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			
RC_KILLSWITCH_TH	Threshold for the kill switch	-1	1	0.25
	0-1 indicate where in the full channel range the threshold sits 0 : min 1 : max sign indicates polarity of comparison positive : true when channel>th negative : true when channel<th			

Return To Land

Name	Description	Min	Max	Default
	Comment			
RTL_RETURN_ALT	RTL altitude	0	150	60

Name	Description	Min	Max	Default
	Comment			
	Altitude to fly back in RTL in meters			
RTL_DESCEND_ALT	RTL loiter altitude	2	100	30
	Stay at this altitude above home position after RTL descending. Land (i.e. slowly descend) from this altitude if autolanding allowed.			
RTL_LAND_DELAY	RTL delay	-1	300	-1.0
	Delay after descend before landing in RTL mode. If set to -1 the system will not land but loiter at RTL_DESCEND_ALT.			
RTL_MIN_DIST	Minimum distance to trigger rising to a safe altitude	0.5	20	5.0
	If the system is horizontally closer than this distance to home it will land straight on home instead of raising to the return altitude first.			

Runway Takeoff

Name	Description	Min	Max	Default
	Comment			
RWTO_TKOFF	Runway takeoff with landing gear			0
RWTO_HDG	Specifies which heading should be held during runnway takeoff	0	1	0
	0: airframe heading, 1: heading towards takeoff waypoint			
RWTO_NAV_ALT	Altitude AGL at which we have enough ground clearance to allow some roll. Until RWTO_NAV_ALT is reached the plane is held level and only rudder is used to keep the heading (see RWTO_HDG). This should be below FW_CLMBOUT_DIFF if FW_CLMBOUT_DIFF > 0	0.0	100.0	5.0
RWTO_MAX_THR	Max throttle during runway takeoff. (Can be used to test taxi on runway)	0.0	1.0	1.0

Name	Description	Min	Max	Default
	Comment			
RWTO_PSP	Pitch setpoint during taxi / before takeoff airspeed is reached. A taildragger with stearable wheel might need to pitch up a little to keep it's wheel on the ground before airspeed to takeoff is reached	0.0	20.0	0.0
RWTO_MAX_PITCH	Max pitch during takeoff. Fixed-wing settings are used if set to 0. Note that there is also a minimum pitch of 10 degrees during takeoff, so this must be larger if set	0.0	60.0	20.0
RWTO_MAX_ROLL	Max roll during climbout. Roll is limited during climbout to ensure enough lift and prevents aggressive navigation before we're on a safe height	0.0	60.0	25.0
RWTO_AIRSPD_SCL	Min. airspeed scaling factor for takeoff. Pitch up will be commanded when the following airspeed is reached: FW_AIRSPD_MIN * RWTO_AIRSPD_SCL	0.0	2.0	1.3

SD Logging

Name	Description	Min	Max	Default
	Comment			
SDLOG_UTC_OFFSET	UTC offset (unit: min)	-1000	1000	0
	the difference in hours and minutes from Coordinated Universal Time (UTC) for a your place and date. for example, In case of South Korea(UTC+09:00), UTC offset is 540 min (9*60) refer to https://en.wikipedia.org/wiki/List_of_UTC_time_offsets (https://en.wikipedia.org/wiki/List_of_UTC_time_ofsets)			
SDLOG_RATE	Logging rate	-1	250	-1
	A value of -1 indicates the commandline argument should be obeyed. A value of 0 sets the minimum rate, any other value is interpreted as rate in Hertz. This parameter is only read out before logging starts (which commonly is before arming).			
SDLOG_EXT	Extended logging mode	-1	1	-1
	A value of -1 indicates the command line argument should be obeyed. A value of 0 disables extended logging mode, a value of 1 enables it. This parameter is only read out before logging starts (which commonly is before arming).			

Name	Description	Min	Max	Default
	Comment			
SDLOG_GPSTIME	Use timestamps only if GPS 3D fix is available			1
	Constrain the log folder creation to only use the time stamp if a 3D GPS lock is present.			
SDLOG_PRIO_BOOST	Give logging app higher thread priority to avoid data loss. This is used for gathering replay logs for the ekf2 module	0	3	2
	A value of 0 indicates that the default priority is used. Increasing the parameter in steps of one increases the priority.			

Sensor Calibration

Name	Description	Min	Max	Default
	Comment			
CAL_BOARD_ID	ID of the board this parameter set was calibrated on			0
CAL_GYRO0_ID	ID of the Gyro that the calibration is for			0
CAL_GYRO0_XOFF	Gyro X-axis offset	-10.0	10.0	0.0
CAL_GYRO0_YOFF	Gyro Y-axis offset	-10.0	10.0	0.0
CAL_GYRO0_ZOFF	Gyro Z-axis offset	-5.0	5.0	0.0
CAL_GYRO0_XSCALE	Gyro X-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO0_YSCALE	Gyro Y-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO0_ZSCALE	Gyro Z-axis scaling factor	-1.5	1.5	1.0
CAL_MAG0_ID	ID of Magnetometer the calibration is for			0
CAL_MAG0_ROT	Rotation of magnetometer 0 relative to airframe	-1	30	-1
	An internal magnetometer will force a value of -1, so a GCS should only attempt to configure the rotation if the value is greater than or equal to zero.			
CAL_MAG0_XOFF	Magnetometer X-axis offset	-500.0	500.0	0.0
CAL_MAG0_YOFF	Magnetometer Y-axis offset	-500.0	500.0	0.0
CAL_MAG0_ZOFF	Magnetometer Z-axis offset	-500.0	500.0	0.0

Name	Description	Min	Max	Default
	Comment			
CAL_MAG0_XSCALE	Magnetometer X-axis scaling factor			1.0
CAL_MAG0_YSCALE	Magnetometer Y-axis scaling factor			1.0
CAL_MAG0_ZSCALE	Magnetometer Z-axis scaling factor			1.0
CAL_ACC0_ID	ID of the Accelerometer that the calibration is for			0
CAL_ACC0_XOFF	Accelerometer X-axis offset			0.0
CAL_ACC0_YOFF	Accelerometer Y-axis offset			0.0
CAL_ACC0_ZOFF	Accelerometer Z-axis offset			0.0
CAL_ACC0_XSCALE	Accelerometer X-axis scaling factor			1.0
CAL_ACC0_YSCALE	Accelerometer Y-axis scaling factor			1.0
CAL_ACC0_ZSCALE	Accelerometer Z-axis scaling factor			1.0
CAL_GYRO1_ID	ID of the Gyro that the calibration is for			0
CAL_GYRO1_XOFF	Gyro X-axis offset	-10.0	10.0	0.0
CAL_GYRO1_YOFF	Gyro Y-axis offset	-10.0	10.0	0.0
CAL_GYRO1_ZOFF	Gyro Z-axis offset	-5.0	5.0	0.0
CAL_GYRO1_XSCALE	Gyro X-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO1_YSCALE	Gyro Y-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO1_ZSCALE	Gyro Z-axis scaling factor	-1.5	1.5	1.0
CAL_MAG1_ID	ID of Magnetometer the calibration is for			0
CAL_MAG1_ROT	Rotation of magnetometer 1 relative to airframe	-1	30	-1
	An internal magnetometer will force a value of -1, so a GCS should only attempt to configure the rotation if the value is greater than or equal to zero.			
CAL_MAG1_XOFF	Magnetometer X-axis offset	-500.0	500.0	0.0
CAL_MAG1_YOFF	Magnetometer Y-axis offset	-500.0	500.0	0.0
CAL_MAG1_ZOFF	Magnetometer Z-axis offset	-500.0	500.0	0.0
CAL_MAG1_XSCALE	Magnetometer X-axis scaling factor			1.0

Name	Description	Min	Max	Default
	Comment			
CAL_MAG1_YSCALE	Magnetometer Y-axis scaling factor			1.0
CAL_MAG1_ZSCALE	Magnetometer Z-axis scaling factor			1.0
CAL_ACC1_ID	ID of the Accelerometer that the calibration is for			0
CAL_ACC1_XOFF	Accelerometer X-axis offset			0.0
CAL_ACC1_YOFF	Accelerometer Y-axis offset			0.0
CAL_ACC1_ZOFF	Accelerometer Z-axis offset			0.0
CAL_ACC1_XSCALE	Accelerometer X-axis scaling factor			1.0
CAL_ACC1_YSCALE	Accelerometer Y-axis scaling factor			1.0
CAL_ACC1_ZSCALE	Accelerometer Z-axis scaling factor			1.0
CAL_GYRO2_ID	ID of the Gyro that the calibration is for			0
CAL_GYRO2_XOFF	Gyro X-axis offset	-10.0	10.0	0.0
CAL_GYRO2_YOFF	Gyro Y-axis offset	-10.0	10.0	0.0
CAL_GYRO2_ZOFF	Gyro Z-axis offset	-5.0	5.0	0.0
CAL_GYRO2_XSCALE	Gyro X-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO2_YSCALE	Gyro Y-axis scaling factor	-1.5	1.5	1.0
CAL_GYRO2_ZSCALE	Gyro Z-axis scaling factor	-1.5	1.5	1.0
CAL_MAG2_ID	ID of Magnetometer the calibration is for			0
CAL_MAG2_ROT	Rotation of magnetometer 2 relative to airframe	-1	30	-1
	An internal magnetometer will force a value of -1, so a GCS should only attempt to configure the rotation if the value is greater than or equal to zero.			
CAL_MAG2_XOFF	Magnetometer X-axis offset	-500.0	500.0	0.0
CAL_MAG2_YOFF	Magnetometer Y-axis offset	-500.0	500.0	0.0
CAL_MAG2_ZOFF	Magnetometer Z-axis offset	-500.0	500.0	0.0
CAL_MAG2_XSCALE	Magnetometer X-axis scaling factor			1.0
CAL_MAG2_YSCALE	Magnetometer Y-axis scaling factor			1.0

Name	Description	Min	Max	Default
	Comment			
CAL_MAG2_ZSCALE	Magnetometer Z-axis scaling factor			1.0
CAL_ACC2_ID	ID of the Accelerometer that the calibration is for			0
CAL_ACC2_XOFF	Accelerometer X-axis offset			0.0
CAL_ACC2_YOFF	Accelerometer Y-axis offset			0.0
CAL_ACC2_ZOFF	Accelerometer Z-axis offset			0.0
CAL_ACC2_XSCALE	Accelerometer X-axis scaling factor			1.0
CAL_ACC2_YSCALE	Accelerometer Y-axis scaling factor			1.0
CAL_ACC2_ZSCALE	Accelerometer Z-axis scaling factor			1.0
CAL_ACC_PRIME	Primary accel ID			0
CAL_GYRO_PRIME	Primary gyro ID			0
CAL_MAG_PRIME	Primary mag ID			0
CAL_MAG_SIDES	Bitfield selecting mag sides for calibration	34	63	63
	DETECT_ORIENTATION_TAIL_DOWN = 1 DETECT_ORIENTATION_NOSE_DOWN = 2 DETECT_ORIENTATION_LEFT = 4 DETECT_ORIENTATION_RIGHT = 8 DETECT_ORIENTATION_UPSIDE_DOWN = 16 DETECT_ORIENTATION_RIGHTSIDE_UP = 32			
CAL_BARO_PRIME	Primary baro ID			0
SENS_DPRES_OFF	Differential pressure sensor offset			0.0
	The offset (zero-reading) in Pascal			
SENS_DPRES_ANSC	Differential pressure sensor analog scaling			0
	Pick the appropriate scaling from the datasheet. this number defines the (linear) conversion from voltage to Pascal (pa). For the MPXV7002DP this is 1000. NOTE: If the sensor always registers zero, try switching the static and dynamic tubes.			
SENS_BARO_QNH	QNH for barometer	500	1500	1013.25
SENS_BOARD_ROT	Board rotation			0

Name	Description	Min	Max	Default
	Comment			
	This parameter defines the rotation of the FMU board relative to the platform.			
SENS_FLOW_ROT	PX4Flow board rotation			0
	This parameter defines the rotation of the PX4FLOW board relative to the platform. Zero rotation is defined as Y on flow board pointing towards front of vehicle			
SENS_BOARD_Y_OFF	Board rotation Y (Pitch) offset			0.0
	This parameter defines a rotational offset in degrees around the Y (Pitch) axis. It allows the user to fine tune the board offset in the event of misalignment.			
SENS_BOARD_X_OFF	Board rotation X (Roll) offset			0.0
	This parameter defines a rotational offset in degrees around the X (Roll) axis It allows the user to fine tune the board offset in the event of misalignment.			
SENS_BOARD_Z_OFF	Board rotation Z (YAW) offset			0.0
	This parameter defines a rotational offset in degrees around the Z (Yaw) axis. It allows the user to fine tune the board offset in the event of misalignment.			
SENS_EXT_MAG_ROT	External magnetometer rotation			0
SENS_EXT_MAG	Select primary magnetometer	0	2	0

Sensor Enable

Name	Description	Min	Max	Default
	Comment			
SENS_EN_LL40LS	Lidar-Lite (LL40LS) PWM			0
SENS_EN_SF0X	Lightware SF0x laser rangefinder			0

Snapdragon UART ESC

Name	Description	Min	Max	Default
	Comment			
UART_ESC_MODEL	ESC model			2

Name	Description	Min	Max	Default
	Comment			
	See esc_model_t enum definition in uart_esc_dev.h for all supported ESC model enum values.			
UART_ESC_BAUD	ESC UART baud rate			250000
	Default rate is 250Kbps, whic is used in off-the-shelf QRP ESC products.			
UART_ESC_MOTOR1	Motor 1 Mapping			4
UART_ESC_MOTOR2	Motor 2 Mapping			2
UART_ESC_MOTOR3	Motor 3 Mapping			1
UART_ESC_MOTOR4	Motor 4 Mapping			3

Subscriber Example

Name	Description	Min	Max	Default
	Comment			
SUB_INTERV	Interval of one subscriber in the example in ms			100
SUB_TESTF	Float Demonstration Parameter in the Example			3.14

System

Name	Description	Min	Max	Default
	Comment			
LED_RGB_MAXBRT	RGB Led brightness limit	0	15	15
	Set to 0 to disable, 1 for minimum brightness up to 15 (max)			
SYS_AUTOSTART	Auto-start script index	0	99999	0
	CHANGING THIS VALUE REQUIRES A RESTART. Defines the auto-start script used to bootstrap the system.			
SYS_AUTOCONFIG	Automatically configure default values	0	1	0
	Set to 1 to reset parameters on next system startup (setting defaults). Platform-specific values are used if available. RC* parameters are preserved.			

Name	Description	Min	Max	Default
	Comment			
SYS_USE_IO	Set usage of IO board	0	1	1
	Can be used to use a standard startup script but with a FMU only set-up. Set to 0 to force the FMU only set-up.			
SYS_RESTART_TYPE	Set restart type	0	2	2
	Set by px4io to indicate type of restart			
SYS_MC_EST_GROUP	Set multicopter estimator group	0	2	0
	Set the group of estimators used for multicopters and vtols			
SYS_COMPANION	TELEM2 as companion computer link	0	1921600	157600
	CHANGING THIS VALUE REQUIRES A RESTART. Configures the baud rate of the TELEM2 connector as companion computer interface.			
SYS_PARAM_VER	Parameter version	0		1
	This monotonically increasing number encodes the parameter compatibility set. whenever it increases parameters might not be backwards compatible and ground control stations should suggest a fresh configuration.			
SYS_LOGGER	SD logger	0	1	0

Testing

Name	Description	Min	Max	Default
	Comment			
TEST_MIN				-1.0
TEST_MAX				1.0
TEST_TRIM				0.5
TEST_HP				10.0
TEST_LP				10.0
TEST_P				0.2
TEST_I				0.1

Name	Description	Min	Max	Default
	Comment			
TEST_I_MAX				1.0
TEST_D				0.01
TEST_D_LP				10.0
TEST_MEAN				1.0
TEST_DEV				2.0
TEST_PARAMS				12345678

UAVCAN

Name	Description	Min	Max	Default
	Comment			
UAVCAN_ENABLE	UAVCAN mode	0	3	0
	0 - UAVCAN disabled. 1 - Enabled support for UAVCAN actuators and sensors. 2 - Enabled support for dynamic node ID allocation and firmware update. 3 - Sets the motor control outputs to UAVCAN and enables support for dynamic node ID allocation and firmware update.			
UAVCAN_NODE_ID	UAVCAN Node ID	1	125	1
	Read the specs at http://uavcan.org (http://uavcan.org) to learn more about Node ID.			
UAVCAN_BITRATE	UAVCAN CAN bus bitrate	20000	1000000	1000000

VTOL Attitude Control

Name	Description	Min	Max	Default
	Comment			
VT_TRANS_THR	Target throttle value for pusher/puller motor during the transition to fw mode	0.0	1.0	0.6
VT_DWN_PITCH_MAX	Maximum allowed down-pitch the controller is able to demand. This prevents large, negative lift values being created when facing strong winds. The vehicle will use the pusher motor to accelerate forward if necessary	0.0	45.0	5.0
VT_FWD_THRUST_SC	Fixed wing thrust scale for hover forward flight	0.0	2.0	0.0

Name	Description	Min	Max	Default
	Comment			
	Scale applied to fixed wing thrust being used as source for forward acceleration in multirotor mode. This technique can be used to avoid the plane having to pitch down a lot in order to move forward. Setting this value to 0 (default) will disable this strategy.			
VT_FW_MIN_ALT	QuadChute	0.0	200.0	0.0
	Minimum altitude for fixed wing flight, when in fixed wing the altitude drops below this altitude the vehicle will transition back to MC mode and enter failsafe RTL			
VT_TILT_MC	Position of tilt servo in mc mode	0.0	1.0	0.0
VT_TILT_TRANS	Position of tilt servo in transition mode	0.0	1.0	0.3
VT_TILT_FW	Position of tilt servo in fw mode	0.0	1.0	1.0
VT_TRANS_P2_DUR	Duration of front transition phase 2	0.1	5.0	0.5
	Time in seconds it should take for the rotors to rotate forward completely from the point when the plane has picked up enough airspeed and is ready to go into fixed wind mode.			
VT_FW_MOT_OFFID	The channel number of motors that must be turned off in fixed wing mode	0	12345678	0
VT_MOT_COUNT	VTOL number of engines	0	8	0
VT_IDLE_PWM_MC	Idle speed of VTOL when in multicopter mode	900	2000	900
VT_MC_ARSPD_MIN	Minimum airspeed in multicopter mode	0.0	30.0	10.0
	This is the minimum speed of the air flowing over the control surfaces.			
VT_MC_ARSPD_MAX	Maximum airspeed in multicopter mode	0.0	30.0	30.0
	This is the maximum speed of the air flowing over the control surfaces.			
VT_MC_ARSPD_TRIM	Trim airspeed when in multicopter mode	0.0	30.0	10.0
	This is the airflow over the control surfaces for which no airspeed scaling is applied in multicopter mode.			
VT_FW_PERM_STAB	Permanent stabilization in fw mode			0

Name	Description	Min	Max	Default
	Comment			
	If set to one this parameter will cause permanent attitude stabilization in fw mode. This parameter has been introduced for pure convenience sake.			
VT_FW_PITCH_TRIM	Fixed wing pitch trim	-1.0	1.0	0.0
	This parameter allows to adjust the neutral elevon position in fixed wing mode.			
VT_POWER_MAX	Motor max power	1	10000	120.0
	Indicates the maximum power the motor is able to produce. Used to calculate propeller efficiency map.			
VT_PROP_EFF	Propeller efficiency parameter	0.0	1.0	0.0
	Influences propeller efficiency at different power settings. Should be tuned beforehand.			
VT_ARSP_LP_GAIN	Total airspeed estimate low-pass filter gain	0.0	1.0	0.3
	Gain for tuning the low-pass filter for the total airspeed estimate			
VT_TYPE	VTOL Type (Tailsitter=0, Tiltrotor=1, Standard=2)	0	2	0
VT_ELEV_MC_LOCK	Lock elevons in multicopter mode			0
	If set to 1 the elevons are locked in multicopter mode			
VT_F_TRANS_DUR	Duration of a front transition	0.00	10.00	3.0
	Time in seconds used for a transition			
VT_B_TRANS_DUR	Duration of a back transition	0.00	10.00	2.0
	Time in seconds used for a back transition			
VT_ARSP_BLEND	Transition blending airspeed	0.00	30.00	8.0
	Airspeed at which we can start blending both fw and mc controls. Set to 0 to disable.			
VT_ARSP_TRANS	Transition airspeed	0.00	30.00	10.0

Name	Description	Min	Max	Default
	Comment			
	Airspeed at which we can switch to fw mode			
VT_OPT_RECOV_EN	Optimal recovery strategy for pitch-weak tailsitters			0
VT_WV_YAWR_SCL	Weather-vane yaw rate scale	0.0	1.0	0.15
	The desired yawrate from the controller will be scaled in order to avoid yaw fighting against the wind.			
VT_TRANS_TIMEOUT	Front transition timeout	0.00	30.00	15.0
	Time in seconds after which transition will be cancelled. Disabled if set to 0.			
VT_TRANS_MIN_TM	Front transition minimum time	0.0	10.0	2.0
	Minimum time in seconds for front transition.			
VT_NAV_FORCE_VT	Force VTOL mode takeoff and land	0	1	1

mTECS

Name	Description	Min	Max	Default
	Comment			
MT_ENABLED	mTECS enabled			0
MT_THR_FF	Total Energy Rate Control Feedforward Maps the total energy rate setpoint to the throttle setpoint	0.0	10.0	0.7
MT_THR_P	Total Energy Rate Control P Maps the total energy rate error to the throttle setpoint	0.0	10.0	0.1
MT_THR_I	Total Energy Rate Control I Maps the integrated total energy rate to the throttle setpoint	0.0	10.0	0.25
MT_THR_OFF	Total Energy Rate Control Offset (Cruise throttle sp)	0.0	10.0	0.7
MT_PIT_FF	Energy Distribution Rate Control Feedforward Maps the energy distribution rate setpoint to the pitch setpoint	0.0	10.0	0.4

Name	Description	Min	Max	Default
	Comment			
MT_PIT_P	Energy Distribution Rate Control P Maps the energy distribution rate error to the pitch setpoint	0.0	10.0	0.03
MT_PIT_I	Energy Distribution Rate Control I Maps the integrated energy distribution rate error to the pitch setpoint	0.0	10.0	0.03
MT_PIT_OFF	Total Energy Distribution Offset (Cruise pitch sp)	0.0	10.0	0.0
MT_THR_MIN	Minimal Throttle Setpoint	0.0	1.0	0.0
MT_THR_MAX	Maximal Throttle Setpoint	0.0	1.0	1.0
MT_PIT_MIN	Minimal Pitch Setpoint in Degrees	-90.0	90.0	-45.0
MT_PIT_MAX	Maximal Pitch Setpoint in Degrees	-90.0	90.0	20.0
MT_ALT_LP	Lowpass (cutoff freq.) for altitude			1.0
MT_FPA_LP	Lowpass (cutoff freq.) for the flight path angle			1.0
MT_FPA_P	P gain for the altitude control Maps the altitude error to the flight path angle setpoint	0.0	10.0	0.3
MT_FPA_D	D gain for the altitude control Maps the change of altitude error to the flight path angle setpoint	0.0	10.0	0.0
MT_FPA_D_LP	Lowpass for FPA error derivative calculation (see MT_FPA_D)			1.0
MT_FPA_MIN	Minimal flight path angle setpoint	-90.0	90.0	-20.0
MT_FPA_MAX	Maximal flight path angle setpoint	-90.0	90.0	30.0
MT_A_LP	Lowpass (cutoff freq.) for airspeed			0.5
MT_AD_LP	Airspeed derivative calculation lowpass			0.5
MT_ACC_P	P gain for the airspeed control Maps the airspeed error to the acceleration setpoint	0.0	10.0	0.3
MT_ACC_D	D gain for the airspeed control Maps the change of airspeed error to the acceleration setpoint	0.0	10.0	0.0
MT_ACC_D_LP	Lowpass for ACC error derivative calculation (see MT_ACC_D)			0.5
MT_ACC_MIN	Minimal acceleration (air)			-40.0

Name	Description	Min	Max	Default
	Comment			
MT_ACC_MAX	Maximal acceleration (air)			40.0
MT_TKF_THR_MIN	Minimal throttle during takeoff	0.0	1.0	1.0
MT_TKF_THR_MAX	Maximal throttle during takeoff	0.0	1.0	1.0
MT_TKF_PIT_MIN	Minimal pitch during takeoff	-90.0	90.0	0.0
MT_TKF_PIT_MAX	Maximal pitch during takeoff	-90.0	90.0	45.0
MT_USP_THR_MIN	Minimal throttle in underspeed mode	0.0	1.0	1.0
MT_USP_THR_MAX	Maximal throttle in underspeed mode	0.0	1.0	1.0
MT_USP_PIT_MIN	Minimal pitch in underspeed mode	-90.0	90.0	-45.0
MT_USP_PIT_MAX	Maximal pitch in underspeed mode	-90.0	90.0	0.0
MT_LND_THR_MIN	Minimal throttle in landing mode (only last phase of landing)	0.0	1.0	0.0
MT_LND_THR_MAX	Maximal throttle in landing mode (only last phase of landing)	0.0	1.0	0.0
MT_LND_PIT_MIN	Minimal pitch in landing mode	-90.0	90.0	-5.0
MT_LND_PIT_MAX	Maximal pitch in landing mode	-90.0	90.0	15.0
MT_THR_I_MAX	Integrator Limit for Total Energy Rate Control	0.0	10.0	10.0
MT_PIT_I_MAX	Integrator Limit for Energy Distribution Rate Control	0.0	10.0	10.0

Miscellaneous

Name	Description	Min	Max	Default
	Comment			
EXFW_HDNG_P				0.1
EXFW_ROLL_P				0.2
EXFW_PITCH_P				0.2
RV_YAW_P				0.1
COM_FLTMODE1	First flightmode slot (1000-1160)			-1

Name	Description	Min	Max	Default
	Comment			
	If the main switch channel is in this range the selected flight mode will be applied.			
COM_FLTMODE2	Second flightmode slot (1160-1320)			-1
	If the main switch channel is in this range the selected flight mode will be applied.			
COM_FLTMODE3	Third flightmode slot (1320-1480)			-1
	If the main switch channel is in this range the selected flight mode will be applied.			
COM_FLTMODE4	Fourth flightmode slot (1480-1640)			-1
	If the main switch channel is in this range the selected flight mode will be applied.			
COM_FLTMODE5	Fifth flightmode slot (1640-1800)			-1
	If the main switch channel is in this range the selected flight mode will be applied.			
COM_FLTMODE6	Sixth flightmode slot (1800-2000)			-1
	If the main switch channel is in this range the selected flight mode will be applied.			
SEG_TH2V_P				10.0
SEG_TH2V_I				0.0
SEG_TH2V_I_MAX				0.0
SEG_Q2V				1.0
RC_MAP_FAILSAFE	Failsafe channel mapping	0	18	0
	The RC mapping index indicates which channel is used for failsafe If 0, whichever channel is mapped to throttle is used otherwise the value indicates the specific rc channel to use			
MAV_TYPE				2