ACCEL_Z_D	0		0.000 0.400	Throttle acceleration controller D gain. Compensates for short-term change in desired vertical acceleration vs actual acceleration
ACCEL_Z_FILT	20			
ACCEL_Z_I	1		0.000 3.000	Throttle acceleration controller I gain. Corrects long-term difference in desired vertical acceleration and actual acceleration
ACCEL_Z_IMAX	800	Percent*10	0 1000	Throttle acceleration controller I gain maximum. Constrains the maximum pwm that the I term will generate
ACCEL_Z_P	0,5		0.500 1.500	Throttle acceleration controller P gain. Converts the difference between desired vertical acceleration and actual acceleration into a
ACRO_BAL_PITCH	1		0 3	rate at which pitch angle returns to level in acro mode. A higher value causes the vehicle to return to level faster.
ACRO_BAL_ROLL	1		0 3	rate at which roll angle returns to level in acro mode. A higher value causes the vehicle to return to level faster.
ACRO_EXPO	0,3		0:Disabled 0.1:Very Low 0.2:Low 0.3:Medium 0.4:High	Acro roll/pitch Expo to allow faster rotation when stick at edges
ACRO_RP_P	4,5		1 10	Converts pilot roll and pitch into a desired rate of rotation in ACRO and SPORT mode. Higher values mean faster rate of rotation.
ACRO_TRAINER	2		0:Disabled 1:Leveling 2:Leveling and Limited	Type of trainer used in acro mode
ACRO_YAW_P	4,5		1 10	Converts pilot yaw input into a desired rate of rotation in ACRO, Stabilize and SPORT modes. Higher values mean faster rate of
ADSB_ENABLE	0			
AHRS_COMP_BETA	0,1		0.001 0.5	This controls the time constant for the cross-over frequency used to fuse AHRS (airspeed and heading) and GPS data to estimate ground velocity. Time constant is 0.1/beta. A larger time constant will use GPS data less and a small time constant will use air data less.
AHRS_EKF_TYPE	2			
AHRS_GPS_GAIN	1		0.0 1.0	This controls how how much to use the GPS to correct the attitude. This should never be set to zero for a plane as it would result in the plane losing control in turns. For a plane please use the default value
AHRS_GPS_MINSATS	6		0 10	Minimum number of satellites visible to use GPS for velocity based corrections attitude correction. This defaults to 6, which is about the point at which the velocity numbers from a GPS become too unreliable for accurate correction of the accelerometers.
AHRS_GPS_USE	1		0:Disabled 1:Enabled	This controls whether to use dead-reckoning or GPS based navigation. If set to 0 then the GPS won't be used for navigation, and only dead reckoning will be used. A value of zero should never be used for normal flight.
AHRS_ORIENTATION	0		0:None 1:Yaw45 2:Yaw90 3:Yaw135 4:Yaw180 5:Yaw225 6:Yaw270 7:Yaw315 8:Roll180 9:Roll180Yaw45 10:Roll180Yaw90 11:Roll180Yaw135 12:Pitch180 13:Roll180Yaw225 14:Roll180Yaw270 15:Roll180Yaw315 16:Roll90 17:Roll90Yaw45 18:Roll90Yaw90 19:Roll90Yaw135 20:Roll270 21:Roll270Yaw45 22:Roll270Yaw90 23:Roll270Yaw136 24:Pitch90 25:Pitch270 26:Pitch180Yaw90 27:Pitch180Yaw270 28:Roll90Pitch90 29:Roll180Pitch90 30:Roll270Pitch90 31:Roll90Pitch180 32:Roll270Pitch180	Overall board orientation relative to the standard orientation for the board type. This rotates the IMU and compass readings to allow the board to be oriented in your vehicle at any 90 or 45 degree angle. This option takes affect on next boot. After changing you will need to re-level your vehicle.
AHRS_RP_P	0,2		0.1 0.4	This controls how fast the accelerometers correct the attitude
AHRS_TRIM_X	-0,03684788	Radians	-0.1745 +0.1745	Compensates for the roll angle difference between the control board and the frame. Positive values make the vehicle roll right.
AHRS_TRIM_Y	-0,03196413	Radians	-0.1745 +0.1745	Compensates for the pitch angle difference between the control board and the frame. Positive values make the vehicle pitch up/back.
AHRS_TRIM_Z	0	Radians	-0.1745 +0.1745	Not Used

AHRS_WIND_MAX	0	m/s	0 127	This sets the maximum allowable difference between ground speed and airspeed. This allows the plane to cope with a failing airspeed sensor. A value of zero means to use the airspeed as is.
AHRS_YAW_P	0,2		0.1 0.4	This controls the weight the compass or GPS has on the heading. A higher value means the heading will track the yaw source (GPS or compass) more rapidly.
ANGLE_MAX	4500	Centi-degrees	10 008 000	Maximum lean angle in all flight modes
ARMING_CHECK	1		0:Disabled 1:Enabled -3:Skip Baro -5:Skip Compass -9:Skip GPS -17:Skip INS -33:Skip Params/Sonar -65:Skip RC 127:Skip	Allows enabling or disabling of pre-arming checks of receiver, accelerometer, barometer, compass and GPS
ATC_ACCEL_P_MAX	110000	Centi-Degrees/	0 1800000:Disabled 72000:Slow 108000:Medium 162000:Fast	Maximum acceleration in pitch axis
ATC_ACCEL_R_MAX	110000	Centi-Degrees/	0 1800000:Disabled 72000:Slow 108000:Medium 162000:Fast	Maximum acceleration in roll axis
ATC_ACCEL_Y_MAX	27000	Centi-Degrees/	0 720000:Disabled 18000:Slow 36000:Medium 54000:Fast	Maximum acceleration in yaw axis
ATC_ANG_LIM_TC	1			
ATC_ANG_PIT_P	4,5			
ATC_ANG_RLL_P	4,5			
ATC_ANG_YAW_P	4,5			
ATC_ANGLE_BOOST	1		0:Disabled 1:Enabled	Angle Boost increases output throttle as the vehicle leans to reduce loss of altitude
ATC_RAT_PIT_D	0,0036			
ATC_RAT_PIT_FILT	20			
ATC_RAT_PIT_I	0,09			
ATC_RAT_PIT_IMAX	0,444			
ATC_RAT_PIT_P	0,135			
ATC_RAT_RLL_D	0,0036			
ATC_RAT_RLL_FILT	20			
ATC_RAT_RLL_I	0,09			
ATC_RAT_RLL_IMAX	0,444			
ATC_RAT_RLL_P	0,135			
ATC_RAT_YAW_D	0			
ATC_RAT_YAW_FILT	5			
ATC_RAT_YAW_I	0,018			
ATC_RAT_YAW_IMAX	0,222			
ATC_RAT_YAW_P	0,18			
ATC_RATE_FF_ENAB	1		0:Disabled 1:Enabled	Controls whether body-frame rate feedfoward is enabled or disabled
ATC_SLEW_YAW	6000	Centi-Degrees/	50 018 000	Maximum rate the yaw target can be updated in Loiter, RTL, Auto flight modes
ATC_THR_MIX_MAX	0,5			
ATC_THR_MIX_MIN	0,1			
AUTOTUNE_AGGR	0,1		0.05 0.10	Autotune aggressiveness. Defines the bounce back used to detect size of the D term.
AUTOTUNE_AXES	7		7:All 1:Roll Only 2:Pitch Only 4:Yaw Only 3:Roll and Pitch 5:Roll and Yaw 6:Pitch	1-byte bitmap of axes to autotune
AUTOTUNE_MIN_D	0,001		0.001 0.006	Defines the minimum D gain
AVD_ENABLE	0			
AVOID_ENABLE	1			
BATT_AMP_OFFSET	0	Volts		Voltage offset at zero current on current sensor
BATT_AMP_PERVOLT	17	Amps/Volt		Number of amps that a 1V reading on the current sensor corresponds to. On the APM2 or Pixhawk using the 3DR Power brick this should be set to 17. For the Pixhawk with the 3DR 4in1 ESC this
BATT_CAPACITY	3300	mAh		Capacity of the battery in mAh when full
BATT_CURR_PIN	-1		-1:Disabled 1:A1 2:A2 3:Pixhawk 12:A12 101:PX4	Setting this to 0 ~ 13 will enable battery current sensing on pins A0 ~ A13. For the 3DR power brick on APM2.5 it should be set to 12. On the PX4 it should be set to 101. On the Pixhawk powered from the PM connector it should be set to 3.
BATT_MONITOR	3		0:Disabled 3:Analog Voltage Only 4:Analog Voltage and Current 5:SMBus 6:Bebop	Controls enabling monitoring of the battery's voltage and current

BATT_VOLT_MULT	10,1			Used to convert the voltage of the voltage sensing pin (BATT_VOLT_PIN) to the actual battery's voltage (pin_voltage * VOLT_MULT). For the 3DR Power brick on APM2 or Pixhawk, this should be set to 10.1. For the Pixhawk with the 3DR 4in1 ESC this should be 12.02. For the PX4 using the PX4IO power supply this
BATT_VOLT_PIN	-1		-1:Disabled 0:A0 1:A1 2:Pixhawk 13:A13 100:PX4	Setting this to 0 ~ 13 will enable battery voltage sensing on pins A0 ~ A13. For the 3DR power brick on APM2.5 it should be set to 13. On the PX4 it should be set to 100. On the Pixhawk powered from the PM connector it should be set to 2.
BATT2_AMP_OFFSET	0	Volts		Voltage offset at zero current on current sensor
BATT2_AMP_PERVOL	17	Amps/Volt		Number of amps that a 1V reading on the current sensor corresponds to. On the APM2 or Pixhawk using the 3DR Power brick this should be set to 17. For the Pixhawk with the 3DR 4in1 ESC this
BATT2_CAPACITY	3300	mAh		Capacity of the battery in mAh when full
BATT2_CURR_PIN	3		-1:Disabled 1:A1 2:A2 3:Pixhawk 12:A12 101:PX4	Setting this to 0 ~ 13 will enable battery current sensing on pins A0 ~ A13. For the 3DR power brick on APM2.5 it should be set to 12. On the PX4 it should be set to 101. On the Pixhawk powered from the PM connector it should be set to 3.
BATT2_MONITOR	0		0:Disabled 3:Analog Voltage Only 4:Analog Voltage and Current 5:SMBus 6:Bebop	Controls enabling monitoring of the battery's voltage and current
BATT2_VOLT_MULT	10,1			Used to convert the voltage of the voltage sensing pin (BATT_VOLT_PIN) to the actual battery's voltage (pin_voltage * VOLT_MULT). For the 3DR Power brick on APM2 or Pixhawk, this should be set to 10.1. For the Pixhawk with the 3DR 4in1 ESC this should be 12.02. For the PX4 using the PX4IO power supply this
BATT2_VOLT_PIN	2		-1:Disabled 0:A0 1:A1 2:Pixhawk 13:A13 100:PX4	Setting this to 0 ~ 13 will enable battery voltage sensing on pins A0 ~ A13. For the 3DR power brick on APM2.5 it should be set to 13. On the PX4 it should be set to 100. On the Pixhawk powered from the PM connector it should be set to 2.
BRD_CAN_ENABLE	0			
BRD_IMU_TARGTEMP	0			
BRD_PWM_COUNT	4		0:No PWMs 2:Two PWMs 4:Four PWMs 6:Six PWMs	Number of auxillary PWMs to enable. On PX4v1 only 0 or 2 is valid. On Pixhawk 0, 2, 4 or 6 is valid.
BRD_SAFETY_MASK	0			
BRD_SAFETYENABLE	0		0:Disabled 1:Enabled	Disabling this option will disable the use of the safety switch on PX4 for arming. Use of the safety switch is highly recommended, so you should leave this option set to 1 except in unusual circumstances.
BRD_SBUS_OUT	0		0:Disabled 1:Enabled	Enabling this option on a Pixhawk enables SBUS servo output from the SBUS output connector
BRD_SER1_RTSCTS	2		0:Disabled 1:Enabled 2:Auto	Enable flow control on serial 1 (telemetry 1) on Pixhawk. You must have the RTS and CTS pins connected to your radio. The standard DF13 6 pin connector for a 3DR radio does have those pins connected. If this is set to 2 then flow control will be auto-detected by checking for the output buffer filling on startup. Note that the PX4v1 does not have hardware flow control pins on this port, so you
BRD_SER2_RTSCTS	2		0:Disabled 1:Enabled 2:Auto	Enable flow control on serial 2 (telemetry 2) on Pixhawk and PX4. You must have the RTS and CTS pins connected to your radio. The standard DF13 6 pin connector for a 3DR radio does have those pins connected. If this is set to 2 then flow control will be auto-detected by checking for the output buffer filling on startup.
BRD_SERIAL_NUM	0		-32767 to 32768 (any 16bit signed number)	User-defined serial number of this vehicle, it can be any arbitrary number you want and has no effect on the autopilot
BRD_TYPE	2			
BTN_ENABLE	0			
CAM_DURATION	10	seconds	0 50	How long the shutter will be held open in 10ths of a second (i.e. enter 10 for 1second, 50 for 5seconds)
CAM_FEEDBACK_PIN	-1			
CAM_FEEDBACK_POL	1			
CAM_MAX_ROLL	0			
CAM_MIN_INTERVAL	0			
CAM_RELAY_ON	1			
CAM_SERVO_OFF	1100	pwm	10 002 000	PWM value to move servo to when shutter is deactivated
CAM_SERVO_ON	1300	pwm	10 002 000	PWM value to move servo to when shutter is activated
CAM_TRIGG_DIST	0	meters	0 1000	Distance in meters between camera triggers. If this value is non-zero then the camera will trigger whenever the GPS position changes by this number of meters regardless of what mode the APM is in. Note that this parameter can also be set in an auto mission using the DO_SET_CAM_TRIGG_DIST command, allowing you to enable/disable the triggering of the camera during the flight.
CAM_TRIGG_TYPE	0		0:Servo 1:Relay	how to trigger the camera to take a picture

CH10_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH10 is above 1800 pwm
CH11_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH11 is above 1800 pwm

CH12_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH12 is above 1800 pwm
CH7_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH7 is above 1800 pwm

CH8_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH8 is above 1800 pwm
CH9_OPT	0		0:Do Nothing 2:Flip 3:Simple Mode 4:RTL 5:Save Trim 7:Save WP 9:Camera Trigger 10:RangeFinder 11:Fence 12:ResetToArmedYaw 13:Super Simple Mode 14:Acro Trainer 16:Auto 17:AutoTune 18:Land 19:EPM 21:Parachute Enable 22:Parachute Release 23:Parachute 3pos 24:Auto Mission Reset 25:AttCon Feed Forward 26:AttCon Accel Limits 27:Retract Mount 28:Relay On/Off 29:Landing Gear 30:Lost Copter Sound 31:Motor Emergency Stop 32:Motor Interlock 33:Brake	Select which function if performed when CH9 is above 1800 pwm
CHUTE_ENABLED	0		0:Disabled 1:Enabled	Parachute release enabled or disabled
CIRCLE_RADIUS	1000	cm	0 10000	Defines the radius of the circle the vehicle will fly when in Circle flight mode
CIRCLE_RATE	20	deg/s	-90 90	Circle mode's turn rate in deg/sec. Positive to turn clockwise, negative for counter clockwise
CLI_ENABLED	0		0:Disabled 1:Enabled	This enables/disables the checking for three carriage returns on telemetry links on startup to enter the diagnostics command line
COMPASS_AUTODEC	1		0:Disabled 1:Enabled	Enable or disable the automatic calculation of the declination based on gps location
COMPASS_CAL_FIT	8			
COMPASS_DEC	-0,006467599	Radians	-3.142 3.142	An angle to compensate between the true north and magnetic north
COMPASS_DEV_ID	73225			Compass device id. Automatically detected, do not set manually
COMPASS_DEV_ID2	131594			Second compass's device id. Automatically detected, do not set manually
COMPASS_DEV_ID3	0			Third compass's device id. Automatically detected, do not set
COMPASS_DIA_X	1			
COMPASS_DIA_Y	1			
COMPASS_DIA_Z	1			
COMPASS_DIA2_X	1			
COMPASS_DIA2_Y	1			
COMPASS_DIA2_Z	1			
COMPASS_DIA3_X	0			
COMPASS_DIA3_Y	0			

COMPASS_DIA3_Z	0			
COMPASS_EXTERN2	0		0:Internal 1:External	Configure second compass so it is attached externally. This is auto-detected on PX4 and Pixhawk.
COMPASS_EXTERN3	0		0:Internal 1:External	Configure third compass so it is attached externally. This is auto-detected on PX4 and Pixhawk.
COMPASS_EXTERNAL	1		0:Internal 1:External	Configure compass so it is attached externally. This is auto-detected on PX4 and Pixhawk, but must be set correctly on an APM2. Set to 1 if the compass is externally connected. When externally connected the COMPASS_ORIENT option operates independently of the AHRS_ORIENTATION board orientation option
COMPASS_LEARN	0		0:Disabled 1:Enabled	Enable or disable the automatic learning of compass offsets
COMPASS_MOT_X	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to the compass's x-axis values to compensate for motor interference
COMPASS_MOT_Y	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to the compass's y-axis values to compensate for motor interference
COMPASS_MOT_Z	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to the compass's z-axis values to compensate for motor interference
COMPASS_MOT2_X	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass2's x-axis values to compensate for motor interference
COMPASS_MOT2_Y	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass2's y-axis values to compensate for motor interference
COMPASS_MOT2_Z	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass2's z-axis values to compensate for motor interference
COMPASS_MOT3_X	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass3's x-axis values to compensate for motor interference
COMPASS_MOT3_Y	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass3's y-axis values to compensate for motor interference
COMPASS_MOT3_Z	0	Offset per Amp	-10 001 000	Multiplied by the current throttle and added to compass3's z-axis values to compensate for motor interference
COMPASS_MOTCT	0		0:Disabled 1:Use Throttle 2:Use Current	Set motor interference compensation type to disabled, throttle or current. Do not change manually.
COMPASS_ODI_X	0			
COMPASS_ODI_Y	0			
COMPASS_ODI_Z	0			
COMPASS_ODI2_X	0			
COMPASS_ODI2_Y	0			
COMPASS_ODI2_Z	0			
COMPASS_ODI3_X	0			
COMPASS_ODI3_Y	0			
COMPASS_ODI3_Z	0			
COMPASS_OFS_X	-90		-400 400	Offset to be added to the compass x-axis values to compensate for metal in the frame
COMPASS_OFS_Y	-63		-400 400	Offset to be added to the compass y-axis values to compensate for metal in the frame
COMPASS_OFS_Z	38		-400 400	Offset to be added to the compass z-axis values to compensate for metal in the frame
COMPASS_OFS2_X	26		-400 400	Offset to be added to compass2's x-axis values to compensate for metal in the frame
COMPASS_OFS2_Y	-275		-400 400	Offset to be added to compass2's y-axis values to compensate for metal in the frame
COMPASS_OFS2_Z	398		-400 400	Offset to be added to compass2's z-axis values to compensate for metal in the frame
COMPASS_OFS3_X	0		-400 400	Offset to be added to compass3's x-axis values to compensate for metal in the frame
COMPASS_OFS3_Y	0		-400 400	Offset to be added to compass3's y-axis values to compensate for metal in the frame
COMPASS_OFS3_Z	0		-400 400	Offset to be added to compass3's z-axis values to compensate for metal in the frame

COMPASS_ORIENT	0		0:None 1:Yaw45 2:Yaw90 3:Yaw135 4:Yaw180 5:Yaw225 6:Yaw270 7:Yaw315 8:Roll180 9:Roll180Yaw45 10:Roll180Yaw90 11:Roll180Yaw135 12:Pitch180 13:Roll180Yaw225 14:Roll180Yaw270 15:Roll180Yaw315 16:Roll90 17:Roll90Yaw45 18:Roll90Yaw90 19:Roll90Yaw135 20:Roll270 21:Roll270Yaw45 22:Roll270Yaw90 23:Roll270Yaw136 24:Pitch90 25:Pitch270 26:Pitch180Yaw90 27:Pitch180Yaw270 28:Roll90Pitch90 29:Roll180Pitch90 30:Roll270Pitch90 31:Roll90Pitch180 32:Roll270Pitch180	The orientation of the compass relative to the autopilot board. This will default to the right value for each board type, but can be changed if you have an external compass. See the documentation for your external compass for the right value. The correct orientation should give the X axis forward, the Y axis to the right and the Z axis down. So if your aircraft is pointing west it should show a positive value for the Y axis, and a value close to zero for the X axis. On a PX4 or Pixhawk with an external compass the correct value is zero if the compass is correctly oriented. NOTE: This orientation is combined with any AHRS_ORIENTATION setting.
COMPASS_ORIENT2	0		0:None 1:Yaw45 2:Yaw90 3:Yaw135 4:Yaw180 5:Yaw225 6:Yaw270 7:Yaw315 8:Roll180 9:Roll180Yaw45 10:Roll180Yaw90 11:Roll180Yaw135 12:Pitch180 13:Roll180Yaw225 14:Roll180Yaw270 15:Roll180Yaw315 16:Roll90 17:Roll90Yaw45 18:Roll90Yaw90 19:Roll90Yaw135 20:Roll270 21:Roll270Yaw45 22:Roll270Yaw90 23:Roll270Yaw136 24:Pitch90 25:Pitch270 26:Pitch180Yaw90 27:Pitch180Yaw270 28:Roll90Pitch90 29:Roll180Pitch90 30:Roll270Pitch90 31:Roll90Pitch180 32:Roll270Pitch180	The orientation of the second compass relative to the frame (if external) or autopilot board (if internal).

COMPASS_ORIENT3	0		0:None 1:Yaw45 2:Yaw90 3:Yaw135 4:Yaw180 5:Yaw225 6:Yaw270 7:Yaw315 8:Roll180 9:Roll180Yaw45 10:Roll180Yaw90 11:Roll180Yaw135 12:Pitch180 13:Roll180Yaw225 14:Roll180Yaw270 15:Roll180Yaw315 16:Roll90 17:Roll90Yaw45 18:Roll90Yaw90 19:Roll90Yaw135 20:Roll270 21:Roll270Yaw45 22:Roll270Yaw90 23:Roll270Yaw136 24:Pitch90 25:Pitch270 26:Pitch180Yaw90 27:Pitch180Yaw270 28:Roll90Pitch90 29:Roll180Pitch90 30:Roll270Pitch90 31:Roll90Pitch180 32:Roll270Pitch180	The orientation of the third compass relative to the frame (if external) or autopilot board (if internal).
COMPASS_PRIMARY	0		0:FirstCompass 1:SecondCompass 2:ThirdCompass	If more than one compass is available this selects which compass is the primary. Normally 0=External, 1=Internal. If no External compass is attached this parameter is ignored
COMPASS_USE	1		0:Disabled 1:Enabled	Enable or disable the use of the compass (instead of the GPS) for determining heading
COMPASS_USE2	1		0:Disabled 1:Enabled	Enable or disable the second compass for determining heading.
COMPASS_USE3	0		0:Disabled 1:Enabled	Enable or disable the third compass for determining heading.
DISARM_DELAY	10	Seconds	0 127	Delay before automatic disarm in seconds. A value of zero disables auto disarm.
EK2_ABIAS_P_NSE	0,005			
EK2_ACC_P_NSE	0,6			
EK2_ALT_M_NSE	3			
EK2_ALT_SOURCE	0			
EK2_CHECK_SCALE	100			
EK2_EAS_I_GATE	400			
EK2_EAS_M_NSE	1,4			
EK2_ENABLE	1			
EK2_FLOW_DELAY	10			
EK2_FLOW_I_GATE	300			
EK2_FLOW_M_NSE	0,25			
EK2_GBIAS_P_NSE	0,0001			
EK2_GLITCH_RAD	25			
EK2_GPS_CHECK	31			
EK2_GPS_DELAY	220			
EK2_GPS_TYPE	0			
EK2_GSCL_P_NSE	0,0005			
EK2_GYRO_P_NSE	0,03			
EK2_HGT_DELAY	60			
EK2_HGT_I_GATE	500			
EK2_IMU_MASK	3			
EK2_LOG_MASK	1			
EK2_MAG_CAL	3			
EK2_MAG_I_GATE	300			
EK2_MAG_M_NSE	0,05			
EK2_MAGB_P_NSE	0,0001			
EK2_MAGE_P_NSE	0,001			
EK2_MAX_FLOW	2,5			
EK2_NOAID_M_NSE	10			
EK2_POS_I_GATE	500			
EK2_POSNE_M_NSE	0,2			
EK2_RNG_I_GATE	500			
EK2_RNG_M_NSE	0,3			
EK2_RNG_USE_HGT	50			
EK2_TAU_OUTPUT	25			
EK2_VEL_I_GATE	500			
EK2_VELD_M_NSE	0,7			

EK2_VELNE_M_NSE	0,5			
EK2_WIND_P_NSE	0,1			
EK2_WIND_PSCALE	0,5			
EK2_YAW_I_GATE	300			
EK2_YAW_M_NSE	0,5			
EKF_ENABLE	0			
EPM_ENABLE	0		0:Disabled 1:Enabled	EPM enable/disable
ESC_CALIBRATION	0		0:Normal Start-up 1:Start-up in ESC Calibration mode if throttle high 2:Start-up in ESC Calibration mode regardless of throttle 9:Disabled	Controls whether ArduCopter will enter ESC calibration on the next restart. Do not adjust this parameter manually.
FENCE_ACTION	1		0:Report Only 1:RTL or Land	What action should be taken when fence is breached
FENCE_ALT_MAX	40	Meters	101 000	Maximum altitude allowed before geofence triggers
FENCE_ENABLE	1		0:Disabled 1:Enabled	Allows you to enable (1) or disable (0) the fence functionality
FENCE_MARGIN	2	Meters	1 10	Distance that autopilot's should maintain from the fence to avoid a breach
FENCE_RADIUS	40	Meters	3 010 000	Circle fence radius which when breached will cause an RTL
FENCE_TOTAL	0			
FENCE_TYPE	3		0:None 1:Altitude 2:Circle 3:Altitude and Circle	Enabled fence types held as bitmask
FLOW_ENABLE	0		0:Disabled 1:Enabled	Setting this to Enabled(1) will enable optical flow. Setting this to Disabled(0) will disable optical flow
FLOW_FXSCALER	0		0	This sets the parts per thousand scale factor correction applied to the flow sensor X axis optical rate. It can be used to correct for variations in effective focal length. Each positive increment of 1 increases the scale factor applied to the X axis optical flow reading by 0.1%. Negative values reduce the scale factor.
FLOW_FYSCALER	0		0	This sets the parts per thousand scale factor correction applied to the flow sensor Y axis optical rate. It can be used to correct for variations in effective focal length. Each positive increment of 1 increases the scale factor applied to the Y axis optical flow reading by 0.1%. Negative values reduce the scale factor.
FLOW_ORIENT_YAW	0		0	Specifies the number of centi-degrees that the flow sensor is yawed relative to the vehicle. A sensor with its X-axis pointing to the right of the vehicle X axis has a positive yaw angle.
FLTMODE1	9		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is <= 1230
FLTMODE2	2		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is >1230, <= 1360
FLTMODE3	0		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is >1360, <= 1490
FLTMODE4	0		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is >1490, <= 1620

FLTMODE5	3		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is >1620, <= 1749
FLTMODE6	5		0:Stabilize 1:Acro 2:AltHold 3:Auto 4:Guided 5:Loiter 6:RTL 7:Circle 9:Land 11:Drift 13:Sport 14:Flip 15:AutoTune 16:PosHold 17:Brake	Flight mode when Channel 5 pwm is >=1750
FRAME	1		0:Plus 1:X 2:V 3:H 4:V-Tail 5:A-Tail 10:Y6B (New)	Controls motor mixing for multicopters. Not used for Tri or Traditional Helicopters.
FS_BATT_ENABLE	1		0:Disabled 1:Land 2:RTL	Controls whether failsafe will be invoked when battery voltage or current runs low
FS_BATT_MAH	300	mAh		Battery capacity remaining to trigger failsafe. Set to 0 to disable battery remaining failsafe. If the battery remaining drops below this level then the copter will RTL
FS_BATT_VOLTAGE	15,3	Volts		Battery voltage to trigger failsafe. Set to 0 to disable battery voltage failsafe. If the battery voltage drops below this voltage then the copter will RTL
FS_CRASH_CHECK	1			
FS_EKF_ACTION	1		1:Land 2:AltHold 3:Land even in	Controls the action that will be taken when an EKF failsafe is invoked
FS_EKF_THRESH	0,8		0.6:Strict 0.8:Default 1.0:Relaxed	Allows setting the maximum acceptable compass and velocity variance
FS_GCS_ENABLE	1		0:Disabled 1:Enabled always RTL 2:Enabled Continue with Mission in Auto Mode	Controls whether failsafe will be invoked (and what action to take) when connection with Ground station is lost for at least 5 seconds. NB. The GCS Failsafe is only active when RC_OVERRIDE is being used to control the vehicle.
FS_THR_ENABLE	3		0:Disabled 1:Enabled always RTL 2:Enabled Continue with Mission in Auto Mode 3:Enabled always	The throttle failsafe allows you to configure a software failsafe activated by a setting on the throttle input channel
FS_THR_VALUE	975	pwm	9 251 100	The PWM level on channel 3 below which throttle sailsafe triggers
GCS_PID_MASK	0		0:None 1:Roll 2:Pitch 4:Yaw	bitmask of PIDs to send MAVLink PID_TUNING messages for
GND_ABS_PRESS	100459,8	pascals		calibrated ground pressure in Pascals
GND_ALT_OFFSET	0	meters	-128 127	altitude offset in meters added to barometric altitude. This is used to allow for automatic adjustment of the base barometric altitude by a ground station equipped with a barometer. The value is added to the barometric altitude read by the aircraft. It is automatically reset to 0 when the barometer is calibrated on each reboot or when a preflight calibration is performed.
GND_EFFECT_COMP	0			
GND_PRIMARY	0			
GND_TEMP	28,90186	degrees celsius		calibrated ground temperature in degrees Celsius
GPS_AUTO_CONFIG	1			
GPS_AUTO_SWITCH	1		0:Disabled 1:Enabled	Automatic switchover to GPS reporting best lock
GPS_GNSS_MODE	0		0: Leave as currently configured 1: GPS 2: SBAS 4: Galileo 8: Beidou 16: IMES 32: QZSS 64: GLONASS	Bitmask for what GNSS system to use
GPS_GNSS_MODE2	0			
GPS_HDOP_GOOD	140		100 900	GPS Hdop value at or below this value represent a good position. Used for pre-arm checks
GPS_INJECT_TO	127		0:send to first GPS 1:send to 2nd GPS 127:send to all	The GGS can send raw serial packets to inject data to multiple GPSes.
GPS_MIN_DGPS	100		0:Any 50:FloatRTK 100:IntegerRTK	Sets the minimum type of differential GPS corrections required before allowing to switch into DGPS mode.
GPS_MIN_ELEV	-100	Degrees	-100 90	This sets the minimum elevation of satellites above the horizon for them to be used for navigation. Setting this to -100 leaves the minimum elevation set to the GPS modules default.

GPS_NAVFILTER	8		0:Portable 2:Stationary 3:Pedestrian 4:Automotive 5:Sea 6:Airborne1G 7:Airborne2G	Navigation filter engine setting
GPS_RAW_DATA	0		0:Disabled 1:log at 1MHz 5:log at 5MHz	Enable logging of RXM raw data from uBlox which includes carrier phase and pseudo range information. This allows for post processing of dataflash logs for more precise positioning. Note that this requires a raw capable uBlox such as the 6P or 6T.
GPS_SAVE_CFG	0			
GPS_SBAS_MODE	2		0:Disabled 1:Enabled 2:NoChange	This sets the SBAS (satellite based augmentation system) mode if available on this GPS. If set to 2 then the SBAS mode is not changed in the GPS. Otherwise the GPS will be reconfigured to enable/disable SBAS. Disabling SBAS may be worthwhile in some parts of the world where an SBAS signal is available but the baseline is too long to be
GPS_SBP_LOGMASK	-256		0x0000:None 0xFFFF:All 0xFF00:External only	Masked with the SBP msg_type field to determine whether SBR1/SBR2 data is logged
GPS_TYPE	1		0:None 1:AUTO 2:uBlox 3:MTK 4:MTK19 5:NMEA 6:SiRF 7:HIL 8:SwiftNav 9:PX4-UAVCAN	GPS type
GPS_TYPE2	0		0:None 1:AUTO 2:uBlox 3:MTK 4:MTK19 5:NMEA 6:SiRF 7:HIL 8:SwiftNav 9:PX4-UAVCAN	GPS type of 2nd GPS
INS_ACC_BODYFIX	2			
INS_ACC2OFFS_X	0,5311985	m/s/s	-3.5 3.5	Accelerometer2 offsets of X axis. This is setup using the acceleration calibration or level operations
INS_ACC2OFFS_Y	0,6924881	m/s/s	-3.5 3.5	Accelerometer2 offsets of Y axis. This is setup using the acceleration calibration or level operations
INS_ACC2OFFS_Z	1,019356	m/s/s	-3.5 3.5	Accelerometer2 offsets of Z axis. This is setup using the acceleration calibration or level operations
INS_ACC2SCAL_X	0,989248		0.8 1.2	Accelerometer2 scaling of X axis. Calculated during acceleration calibration routine
INS_ACC2SCAL_Y	1,049191		0.8 1.2	Accelerometer2 scaling of Y axis Calculated during acceleration calibration routine
INS_ACC2SCAL_Z	1,023431		0.8 1.2	Accelerometer2 scaling of Z axis Calculated during acceleration calibration routine
INS_ACC3OFFS_X	0	m/s/s	-3.5 3.5	Accelerometer3 offsets of X axis. This is setup using the acceleration calibration or level operations
INS_ACC3OFFS_Y	0	m/s/s	-3.5 3.5	Accelerometer3 offsets of Y axis. This is setup using the acceleration calibration or level operations
INS_ACC3OFFS_Z	0	m/s/s	-3.5 3.5	Accelerometer3 offsets of Z axis. This is setup using the acceleration calibration or level operations
INS_ACC3SCAL_X	0		0.8 1.2	Accelerometer3 scaling of X axis. Calculated during acceleration calibration routine
INS_ACC3SCAL_Y	0		0.8 1.2	Accelerometer3 scaling of Y axis Calculated during acceleration calibration routine
INS_ACC3SCAL_Z	0		0.8 1.2	Accelerometer3 scaling of Z axis Calculated during acceleration calibration routine
INS_ACCEL_FILTER	20	Hz	0 127	Filter cutoff frequency for accelerometers. This can be set to a lower value to try to cope with very high vibration levels in aircraft. This option takes effect on the next reboot. A value of zero means no filtering (not recommended!)
INS_ACCOFFS_X	0,1217459	m/s/s	-3.5 3.5	Accelerometer offsets of X axis. This is setup using the acceleration calibration or level operations
INS_ACCOFFS_Y	-0,1176556	m/s/s	-3.5 3.5	Accelerometer offsets of Y axis. This is setup using the acceleration calibration or level operations
INS_ACCOFFS_Z	0,1934629	m/s/s	-3.5 3.5	Accelerometer offsets of Z axis. This is setup using the acceleration calibration or level operations
INS_ACCSCAL_X	0,9958467		0.8 1.2	Accelerometer scaling of X axis. Calculated during acceleration calibration routine
INS_ACCSCAL_Y	0,996595		0.8 1.2	Accelerometer scaling of Y axis Calculated during acceleration calibration routine
INS_ACCSCAL_Z	0,9837444		0.8 1.2	Accelerometer scaling of Z axis Calculated during acceleration calibration routine
INS_GYR_CAL	1			
INS_GYR2OFFS_X	0,007004221	rad/s		Gyro2 sensor offsets of X axis. This is setup on each boot during gyro calibrations

INS_GYR2OFFS_Y	-0,008063184	rad/s		Gyro2 sensor offsets of Y axis. This is setup on each boot during gyro calibrations
INS_GYR2OFFS_Z	-0,001285854	rad/s		Gyro2 sensor offsets of Z axis. This is setup on each boot during gyro calibrations
INS_GYR3OFFS_X	0	rad/s		Gyro3 sensor offsets of X axis. This is setup on each boot during gyro calibrations
INS_GYR3OFFS_Y	0	rad/s		Gyro3 sensor offsets of Y axis. This is setup on each boot during gyro calibrations
INS_GYR3OFFS_Z	0	rad/s		Gyro3 sensor offsets of Z axis. This is setup on each boot during gyro calibrations
INS_GYRO_FILTER	20	Hz	0 127	Filter cutoff frequency for gyroscopes. This can be set to a lower value to try to cope with very high vibration levels in aircraft. This option takes effect on the next reboot. A value of zero means no filtering (not recommended!)
INS_GYROFFS_X	0,01847266	rad/s		Gyro sensor offsets of X axis. This is setup on each boot during gyro calibrations
INS_GYROFFS_Y	0,02209927	rad/s		Gyro sensor offsets of Y axis. This is setup on each boot during gyro calibrations
INS_GYROFFS_Z	0,006210358	rad/s		Gyro sensor offsets of Z axis. This is setup on each boot during gyro calibrations
INS_PRODUCT_ID	5		0:Unknown 1:APM1-1280 2:APM1-2560 88:APM2 3:SITL 4:PX4v1 5:PX4v2 256:Flymaple	Which type of IMU is installed (read-only).
INS_STILL_THRESH	2,5			
INS_TRIM_OPTION	1			
INS_USE	1		0:Disabled 1:Enabled	Use first IMU for attitude, velocity and position estimates
INS_USE2	1		0:Disabled 1:Enabled	Use second IMU for attitude, velocity and position estimates
INS_USE3	0		0:Disabled 1:Enabled	Use third IMU for attitude, velocity and position estimates
LAND_REPOSITION	1		0:No repositioning 1:Repositioning	Enables user input during LAND mode, the landing phase of RTL, and auto mode landings.
LAND_SPEED	50	cm/s	30 200	The descent speed for the final stage of landing in cm/s
LAND_SPEED_HIGH	0			
LGR_SERVO_DEPLOY	1750	pwm	10 002 000	Servo PWM value when landing gear is deployed
LGR_SERVO_RTRACT	1250	pwm	10 002 000	Servo PWM value when landing gear is retracted
LOG_BACKEND_TYPE	1			
LOG_BITMASK	176126		830:Default 894:Default+RCIN 958:Default+IMU 1854:Default+Motors - 6146:NearlyAll-AC315 45054:NearlyAll 131070:All+DisarmedLogging 131071:All+FastATT 262142:All+MotBatt 393214:All+FastIMU 397310:All+FastIMU+PID 655358:All+FullIMU 0:Disabled	4 byte bitmap of log types to enable
LOG_DISARMED	0			
LOG_FILE_BUFSIZE	16			
LOG_REPLAY	0			
MAG_ENABLE	1		0:Disabled 1:Enabled	Setting this to Enabled(1) will enable the compass. Setting this to Disabled(0) will disable the compass
MIS_RESTART	0		0:Resume Mission 1:Restart Mission	Controls mission starting point when entering Auto mode (either restart from beginning of mission or resume from last command run)
MIS_TOTAL	4		0 32766	The number of mission mission items that has been loaded by the ground station. Do not change this manually.
MNT_ANGMAX_PAN	4500	Centi-Degrees	-1 800 017 999	Maximum physical pan (yaw) angular position of the mount
MNT_ANGMAX_ROL	4500	Centi-Degrees	-1 800 017 999	Maximum physical roll angular position of the mount
MNT_ANGMAX_TIL	4500	Centi-Degrees	-1 800 017 999	Maximum physical tilt (pitch) angular position of the mount
MNT_ANGMIN_PAN	-4500	Centi-Degrees	-1 800 017 999	Minimum physical pan (yaw) angular position of mount.
MNT_ANGMIN_ROL	-4500	Centi-Degrees	-1 800 017 999	Minimum physical roll angular position of mount.
MNT_ANGMIN_TIL	-4500	Centi-Degrees	-1 800 017 999	Minimum physical tilt (pitch) angular position of mount.
MNT_DEFLT_MODE	3		0:Retracted 1:Neutral 2:MavLink Targeting 3:RC Targeting 4:GPS Point	Mount default operating mode on startup and after control is returned from autopilot
MNT_JSTICK_SPD	0		0 100	0 for position control, small for low speeds, 100 for max speed. A good general value is 10 which gives a movement speed of 3 degrees per second.

MNT_LEAD_PTCH	0	Seconds	0.0 0.2	Causes the servo angle output to lead the current angle of the vehicle by some amount of time based on current angular rate. Increase until the servo is responsive but doesn't overshoot. Does nothing with pan stabilization enabled.
MNT_LEAD_RLL	0	Seconds	0.0 0.2	Causes the servo angle output to lead the current angle of the vehicle by some amount of time based on current angular rate, compensating for servo delay. Increase until the servo is responsive but doesn't overshoot. Does nothing with pan stabilization enabled.
MNT_NEUTRAL_X	0	Degrees	-180.00 179.99	Mount roll angle when in neutral position
MNT_NEUTRAL_Y	0	Degrees	-180.00 179.99	Mount tilt/pitch angle when in neutral position
MNT_NEUTRAL_Z	0	Degrees	-180.00 179.99	Mount pan/yaw angle when in neutral position
MNT_RC_IN_PAN	0		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8	0 for none, any other for the RC channel to be used to control pan (yaw) movements
MNT_RC_IN_ROLL	0		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8	0 for none, any other for the RC channel to be used to control roll movements
MNT_RC_IN_TILT	0		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8	0 for none, any other for the RC channel to be used to control tilt (pitch) movements
MNT_RETRACT_X	0	Degrees	-180.00 179.99	Mount roll angle when in retracted position
MNT_RETRACT_Y	0	Degrees	-180.00 179.99	Mount tilt/pitch angle when in retracted position
MNT_RETRACT_Z	0	Degrees	-180.00 179.99	Mount yaw/pan angle when in retracted position
MNT_STAB_PAN	0		0:Disabled 1:Enabled	enable pan/yaw stabilisation relative to Earth
MNT_STAB_ROLL	0		0:Disabled 1:Enabled	enable roll stabilisation relative to Earth
MNT_STAB_TILT	0		0:Disabled 1:Enabled	enable tilt/pitch stabilisation relative to Earth
MNT_TYPE	0		0:None 1:Servo 2:3DR Solo 3:Alexmos Serial 4:STorRM32 MAVLink 5:STorRM32 Serial	Mount Type (None, Servo or MAVLink)
MOT_BAT_CURR_MAX	0			
MOT_BAT_CURR_TC	5			
MOT_BAT_VOLT_MAX	0			
MOT_BAT_VOLT_MIN	0			
MOT_HOVER_LEARN	2			
MOT_PWM_MAX	0			
MOT_PWM_MIN	0			
MOT_PWM_TYPE	0			
MOT_SPIN_ARM	0,1			
MOT_SPIN_MAX	0,95			
MOT_SPIN_MIN	0,15			
MOT_THST_EXPO	0,65			
MOT_THST_HOVER	0,1604038			
MOT_YAW_HEADROOM	200			
NTF_BUZZ_ENABLE	1			
NTF_LED_BRIGHT	3			
NTF_LED_OVERRIDE	0			
PHLD_BRAKE_ANGLE	3000	Centi-degrees	20 004 500	PosHold flight mode's max lean angle during braking in centi-degrees
PHLD_BRAKE_RATE	8	deg/sec	4 12	PosHold flight mode's rotation rate during braking in deg/sec
PILOT_ACCEL_Z	250	cm/s/s	50 500	The vertical acceleration used when pilot is controlling the altitude
PILOT_THR_BHV	0		0:None 1:FeedbackFromMid	Bits for: Feedback starts from mid stick
PILOT_THR_FILT	0	Hz	0 10	Throttle filter cutoff (Hz) - active whenever altitude control is inactive - 0 to disable
PILOT_TKOFF_ALT	0	Centimeters	0.0 1000.0	Altitude that altitude control modes will climb to when a takeoff is triggered with the throttle stick.
PILOT_TKOFF_DZ	100		0.0 500.0	Offset from mid stick at which takeoff is triggered
PILOT_VELZ_MAX	250	Centimeters/Se	50 500	The maximum vertical velocity the pilot may request in cm/s
PLND_ENABLED	0			
POS_XY_P	1		0.500 2.000	Loiter position controller P gain. Converts the distance (in the latitude direction) to the target location into a desired speed which is then passed to the loiter latitude rate controller
POS_Z_P	1		1.000 3.000	Position (vertical) controller P gain. Converts the difference between the desired altitude and actual altitude into a climb or descent rate which is passed to the throttle rate controller
PSC_ACC_XY_FILT	2			
RALLY_INCL_HOME	1		0:DoNotIncludeHome 1:IncludeHome	Controls if Home is included as a Rally point (i.e. as a safe landing place) for RTL
RALLY_LIMIT_KM	0,3	kilometers		Maximum distance to rally point. If the closest rally point is more than this number of kilometers from the current position and the home location is closer than any of the rally points from the current position then do RTL to home rather than to the closest rally point. This prevents a leftover rally point from a different airfield being used accidentally. If this is set to 0 then the closest rally point is
RALLY_TOTAL	0			Number of rally points currently loaded

RC_FEEL_RP	50		0 1000:Very Soft 25:Soft 50:Medium 75:Crisp 100:Very Crisp	RC feel for roll/pitch which controls vehicle response to user input with 0 being extremely soft and 100 being crisp
RC_SPEED	490	Hz	50 490	This is the speed in Hertz that your ESCs will receive updates
RC1_DZ	30	pwm	0 200	dead zone around trim or bottom
RC1_MAX	1918	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC1_MIN	1074	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC1_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC1_TRIM	1501	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC10_DZ	0	pwm	0 200	dead zone around trim or bottom
RC10_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC10_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC10_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC10_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC10_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC11_DZ	0	pwm	0 200	dead zone around trim or bottom

RC11_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC11_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC11_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC11_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC11_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC12_DZ	0	pwm	0 200	dead zone around trim or bottom
RC12_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC12_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC12_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC12_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC12_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC13_DZ	0	pwm	0 200	dead zone around trim or bottom

RC13_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC13_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC13_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC13_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC13_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC14_DZ	0	pwm	0 200	dead zone around trim or bottom
RC14_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC14_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC14_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC14_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC14_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC2_DZ	30	pwm	0 200	dead zone around trim or bottom
RC2_MAX	1921	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC2_MIN	1075	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.

RC2_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC2_TRIM	1502	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC3_DZ	30	pwm	0 200	dead zone around trim or bottom
RC3_MAX	1920	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC3_MIN	1074	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC3_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC3_TRIM	1379	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC4_DZ	40	pwm	0 200	dead zone around trim or bottom
RC4_MAX	1920	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC4_MIN	1073	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC4_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC4_TRIM	1505	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC5_DZ	0	pwm	0 200	dead zone around trim or bottom
RC5_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC5_MAX	1920	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC5_MIN	1074	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC5_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC5_TRIM	1076	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC6_DZ	0	pwm	0 200	dead zone around trim or bottom

RC6_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC6_MAX	1500	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC6_MIN	1499	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC6_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC6_TRIM	1500	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC7_DZ	0	pwm	0 200	dead zone around trim or bottom
RC7_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC7_MAX	1500	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC7_MIN	1499	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC7_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC7_TRIM	1500	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC8_DZ	0	pwm	0 200	dead zone around trim or bottom

RC8_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC8_MAX	1500	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC8_MIN	1499	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC8_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC8_TRIM	1500	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC9_DZ	0	pwm	0 200	dead zone around trim or bottom
RC9_FUNCTION	0		0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 18:AileronWithInput 19:Elevator 20:ElevatorWithInput 21:Rudder 24:Flaperon1 25:Flaperon2 26:GroundSteering 27:Parachute 28:EPM 29:LandingGear 30:EngineRunEnable	Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC9_MAX	1900	pwm	8 002 200	RC maximum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC9_MIN	1100	pwm	8 002 200	RC minimum PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RC9_REV	1		-1:Reversed 1:Normal	Reverse servo operation. Set to 1 for normal (forward) operation. Set to -1 to reverse this channel.
RC9_TRIM	0	pwm	8 002 200	RC trim (neutral) PWM pulse width. Typically 1000 is lower limit, 1500 is neutral and 2000 is upper limit.
RCMAP_PITCH	2		1 8	Pitch channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Pitch is normally on channel 2, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.

RCMAP_ROLL	1		1 8	Roll channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Roll is normally on channel 1, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.
RCMAP_THROTTLE	3		1 8	Throttle channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Throttle is normally on channel 3, but you can move it to any channel with this parameter. Warning APM 2.X: Changing the throttle channel could produce unexpected fail-safe results if connection between receiver and on-board PPM Encoder is lost. Disabling on-board PPM Encoder is recommended. Reboot is required for changes to take effect.
RCMAP_YAW	4		1 8	Yaw channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Yaw (also known as rudder) is normally on channel 4, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.
RELAY_DEFAULT	0		0:Off 1:On	The state of the relay on boot.
RELAY_PIN	54		-1:Disabled 13:APM2 A9 pin 47:APM1 relay 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin number for first relay control. This is the pin used for camera control.
RELAY_PIN2	55		-1:Disabled 13:APM2 A9 pin 47:APM1 relay 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin number for 2nd relay control.
RELAY_PIN3	-1		-1:Disabled 13:APM2 A9 pin 47:APM1 relay 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin number for 3rd relay control.
RELAY_PIN4	-1		-1:Disabled 13:APM2 A9 pin 47:APM1 relay 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin number for 4th relay control.

RNGFND_ADDR	0		0 127	This sets the bus address of the sensor, where applicable. Used for the LightWare I2C sensor to allow for multiple sensors on different addresses. A value of 0 disables the sensor.
RNGFND_FUNCTION	0		0:Linear 1:Inverted 2:Hyperbolic	Control over what function is used to calculate distance. For a linear function, the distance is (voltage-offset)*scaling. For a inverted function the distance is (offset-voltage)*scaling. For a hyperbolic function the distance is scaling/(voltage-offset). The functions return the distance in meters.
RNGFND_GAIN	0,8		0.01 2.0	Used to adjust the speed with which the target altitude is changed when objects are sensed below the copter
RNGFND_GNDCLEAR	0	centimeters	0 127	This parameter sets the expected range measurement(in cm) that the range finder should return when the vehicle is on the ground.
RNGFND_MAX_CM	900	centimeters		Maximum distance in centimeters that rangefinder can reliably read
RNGFND_MIN_CM	20	centimeters		Minimum distance in centimeters that rangefinder can reliably read
RNGFND_OFFSET	0,6	Volts		Offset in volts for zero distance for analog rangefinders. Offset added to distance in centimeters for PWM and I2C Lidars
RNGFND_PIN	14		-1:Not Used 0:APM2-A0 1:APM2-A1 2:APM2-A2 3:APM2-A3 4:APM2-A4 5:APM2-A5 6:APM2-A6 7:APM2-A7 8:APM2-A8 9:APM2-A9 11:PX4-airspeed port 15:Pixhawk-airspeed port 64:APM1-airspeed	Analog pin that rangefinder is connected to. Set this to 0..9 for the APM2 analog pins. Set to 64 on an APM1 for the dedicated 'airspeed' port on the end of the board. Set to 11 on PX4 for the analog 'airspeed' port. Set to 15 on the Pixhawk for the analog 'airspeed' port.
RNGFND_PWRRNG	0	meters	0 32767	This parameter sets the estimated terrain distance in meters above which the sensor will be put into a power saving mode (if available). A value of zero means power saving is not enabled
RNGFND_RMETRIC	0		0:No 1:Yes	This parameter sets whether an analog rangefinder is ratiometric. Most analog rangefinders are ratiometric, meaning that their output voltage is influenced by the supply voltage. Some analog rangefinders (such as the SF/02) have their own internal voltage regulators so they are not ratiometric.
RNGFND_SCALING	4,56	meters/Volt		Scaling factor between rangefinder reading and distance. For the linear and inverted functions this is in meters per volt. For the hyperbolic function the units are meterVolts.
RNGFND_SETTLE	0	milliseconds		The time in milliseconds that the rangefinder reading takes to settle. This is only used when a STOP_PIN is specified. It determines how long we have to wait for the rangefinder to give a reading after we set the STOP_PIN high. For a sonar rangefinder with a range of around 7m this would need to be around 50 milliseconds to allow for the sonar pulse to travel to the target and back again.
RNGFND_STOP_PIN	-1		-1:Not Used 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin that enables/disables rangefinder measurement for an analog rangefinder. A value of -1 means no pin. If this is set, then the pin is set to 1 to enable the rangefinder and set to 0 to disable it. This can be used to ensure that multiple sonar rangefinders don't interfere with each other.
RNGFND_TYPE	1		0:None 1:Analog 2:APM2-MaxbotixI2C 3:APM2-PulsedLightI2C 4:PX4-I2C 5:PX4-PWM 6:BBB-PRU 7:LightWareI2C 8:LightWareSerial	What type of rangefinder device that is connected
RNGFND2_ADDR	0		0 127	This sets the bus address of the sensor, where applicable. Used for the LightWare I2C sensor to allow for multiple sensors on different addresses. A value of 0 disables the sensor.
RNGFND2_FUNCTION	0		0:Linear 1:Inverted 2:Hyperbolic	Control over what function is used to calculate distance. For a linear function, the distance is (voltage-offset)*scaling. For a inverted function the distance is (offset-voltage)*scaling. For a hyperbolic function the distance is scaling/(voltage-offset). The functions return the distance in meters.

RNGFND2_GNDCLEAR	10	centimeters	0 127	This parameter sets the expected range measurement(in cm) that the second range finder should return when the vehicle is on the
RNGFND2_MAX_CM	700	centimeters		Maximum distance in centimeters that rangefinder can reliably read
RNGFND2_MIN_CM	20	centimeters		Minimum distance in centimeters that rangefinder can reliably read
RNGFND2_OFFSET	0	Volts		Offset in volts for zero distance
RNGFND2_PIN	-1		-1:Not Used 0:APM2-A0 1:APM2-A1 2:APM2-A2 3:APM2-A3 4:APM2-A4 5:APM2-A5 6:APM2-A6 7:APM2-A7 8:APM2-A8 9:APM2-A9 11:PX4-airspeed port 15:Pixhawk-airspeed port 64:APM1-airspeed	Analog pin that rangefinder is connected to. Set this to 0..9 for the APM2 analog pins. Set to 64 on an APM1 for the dedicated 'airspeed' port on the end of the board. Set to 11 on PX4 for the analog 'airspeed' port. Set to 15 on the Pixhawk for the analog 'airspeed' port.
RNGFND2_RMETRIC	1		0:No 1:Yes	This parameter sets whether an analog rangefinder is ratiometric. Most analog rangefinders are ratiometric, meaning that their output voltage is influenced by the supply voltage. Some analog rangefinders (such as the SF/02) have their own internal voltage regulators so they are not ratiometric.
RNGFND2_SCALING	3	meters/Volt		Scaling factor between rangefinder reading and distance. For the linear and inverted functions this is in meters per volt. For the hyperbolic function the units are meterVolts.
RNGFND2_SETTLE	0	milliseconds		The time in milliseconds that the rangefinder reading takes to settle. This is only used when a STOP_PIN is specified. It determines how long we have to wait for the rangefinder to give a reading after we set the STOP_PIN high. For a sonar rangefinder with a range of around 7m this would need to be around 50 milliseconds to allow for the sonar pulse to travel to the target and back again.
RNGFND2_STOP_PIN	-1		-1:Not Used 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2	Digital pin that enables/disables rangefinder measurement for an analog rangefinder. A value of -1 means no pin. If this is set, then the pin is set to 1 to enable the rangefinder and set to 0 to disable it. This can be used to ensure that multiple sonar rangefinders don't interfere with each other.
RNGFND2_TYPE	0		0:None 1:Analog 2:APM2-MaxbotixI2C 3:APM2-PulsedLightI2C 4:PX4-I2C 5:PX4-PWM 6:BBB-PRU 7:LightWareI2C 8:LightWareSerial	What type of rangefinder device that is connected
RPM_MAX	100000			Maximum RPM to report
RPM_MIN	10			
RPM_MIN_QUAL	0,5			
RPM_SCALING	1			Scaling factor between sensor reading and RPM.
RPM_TYPE	0		0:None 1:PX4-PWM	What type of RPM sensor is connected
RPM2_SCALING	1			Scaling factor between sensor reading and RPM.
RPM2_TYPE	0		0:None 1:PX4-PWM	What type of RPM sensor is connected
RSSI_ANA_PIN	0			
RSSI_CHAN_HIGH	2000			
RSSI_CHAN_LOW	1000			
RSSI_CHANNEL	0			
RSSI_PIN_HIGH	5			
RSSI_PIN_LOW	0			
RSSI_TYPE	0			
RTL_ALT	1500	Centimeters	0 8000	The minimum altitude the model will move to before Returning to Launch. Set to zero to return at current altitude.
RTL_ALT_FINAL	0	Centimeters	-11 000	This is the altitude the vehicle will move to as the final stage of Returning to Launch or after completing a mission. Set to zero to
RTL_CLIMB_MIN	0	Centimeters	0 3000	The vehicle will climb this many cm during the initial climb portion of the RTL
RTL_CONE_SLOPE	3			
RTL_LOIT_TIME	5000	ms	0 60000	Time (in milliseconds) to loiter above home before beginning final descent

RTL_SPEED	0			
SCHED_DEBUG	0		0:Disabled 2:ShowSlips 3:ShowOverruns	Set to non-zero to enable scheduler debug messages. When set to show "Slips" the scheduler will display a message whenever a scheduled task is delayed due to too much CPU load. When set to ShowOverruns the scheduled will display a message whenever a task takes longer than the limit promised in the task table.
SCHED_LOOP_RATE	400			
SERIAL0_BAUD	115		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000	The baud rate used on the USB console. The APM2 can support all baudrates up to 115, and also can support 500. The PX4 can support rates of up to 1500. If you setup a rate you cannot support on APM2 and then can't connect to your board you should load a firmware from a different vehicle type. That will reset all your parameters to defaults.
SERIAL0_PROTOCOL	1			
SERIAL1_BAUD	57		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000	The baud rate used on the Telem1 port. The APM2 can support all baudrates up to 115, and also can support 500. The PX4 can support rates of up to 1500. If you setup a rate you cannot support on APM2 and then can't connect to your board you should load a firmware from a different vehicle type. That will reset all your parameters to defaults.
SERIAL1_PROTOCOL	1		1:GCS Mavlink 3:Frsky D-PORT 4:Frsky S-PORT 5:GPS 7:Alexmos Gimbal Serial 8:SToRM32 Gimbal Serial 9:Lidar	Control what protocol to use on the Telem1 port. Note that the Frsky options require external converter hardware. See the wiki for details.
SERIAL2_BAUD	57		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000	The baud rate of the Telem2 port. The APM2 can support all baudrates up to 115, and also can support 500. The PX4 can support rates of up to 1500. If you setup a rate you cannot support on APM2 and then can't connect to your board you should load a firmware from a different vehicle type. That will reset all your parameters to defaults.
SERIAL2_PROTOCOL	1		1:GCS Mavlink 3:Frsky D-PORT 4:Frsky S-PORT 5:GPS 7:Alexmos Gimbal Serial 8:SToRM32 Gimbal Serial 9:Lidar	Control what protocol to use on the Telem2 port. Note that the Frsky options require external converter hardware. See the wiki for details.
SERIAL3_BAUD	38		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000	The baud rate used for the Serial 3 (GPS). The APM2 can support all baudrates up to 115, and also can support 500. The PX4 can support rates of up to 1500. If you setup a rate you cannot support on APM2 and then can't connect to your board you should load a firmware from a different vehicle type. That will reset all your parameters to defaults.
SERIAL3_PROTOCOL	5		1:GCS Mavlink 3:Frsky D-PORT 4:Frsky S-PORT 5:GPS 7:Alexmos Gimbal Serial 8:SToRM32 Gimbal Serial 9:Lidar	Control what protocol Serial 3 (GPS) should be used for. Note that the Frsky options require external converter hardware. See the wiki for details.
SERIAL4_BAUD	38		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000	The baud rate used for Serial4. The APM2 can support all baudrates up to 115, and also can support 500. The PX4 can support rates of up to 1500. If you setup a rate you cannot support on APM2 and then can't connect to your board you should load a firmware from a different vehicle type. That will reset all your parameters to defaults.
SERIAL4_PROTOCOL	5		1:GCS Mavlink 3:Frsky D-PORT 4:Frsky S-PORT 5:GPS 7:Alexmos Gimbal Serial 8:SToRM32 Gimbal Serial 9:Lidar	Control what protocol Serial4 port should be used for. Note that the Frsky options require external converter hardware. See the wiki for details.
SERIAL5_BAUD	57			

SERIAL5_PROTOCOL	-1			
SIMPLE	0			Bitmask which holds which flight modes use simple heading mode (eg bit 0 = 1 means Flight Mode 0 uses simple mode)
SR0_ADSB	5			
SR0_EXT_STAT	2			
SR0_EXTRA1	4			
SR0_EXTRA2	4			
SR0_EXTRA3	2			
SR0_PARAMS	10			
SR0_POSITION	2			
SR0_RAW_CTRL	0			
SR0_RAW_SENS	2			
SR0_RC_CHAN	2			
SR1_ADSB	5			
SR1_EXT_STAT	0			
SR1_EXTRA1	0			
SR1_EXTRA2	0			
SR1_EXTRA3	0			
SR1_PARAMS	0			
SR1_POSITION	0			
SR1_RAW_CTRL	0			
SR1_RAW_SENS	0			
SR1_RC_CHAN	0			
SR2_ADSB	5			
SR2_EXT_STAT	0			
SR2_EXTRA1	0			
SR2_EXTRA2	0			
SR2_EXTRA3	0			
SR2_PARAMS	0			
SR2_POSITION	0			
SR2_RAW_CTRL	0			
SR2_RAW_SENS	0			
SR2_RC_CHAN	0			
SR3_ADSB	5			
SR3_EXT_STAT	0			
SR3_EXTRA1	0			
SR3_EXTRA2	0			
SR3_EXTRA3	0			
SR3_PARAMS	0			
SR3_POSITION	0			
SR3_RAW_CTRL	0			
SR3_RAW_SENS	0			
SR3_RC_CHAN	0			
SUPER_SIMPLE	0		0:Disabled 1:Mode1 2:Mode2 3:Mode1+2 4:Mode3 5:Mode1+3 6:Mode2+3 7:Mode1+2+3 8:Mode4 9:Mode1+4 10:Mode2+4 11:Mode1+2+4 12:Mode3+4 13:Mode1+3+4 14:Mode2+3+4 15:Mode1+2+3+4 16:Mode5 17:Mode1+5 18:Mode2+5 19:Mode1+2+5 20:Mode3+5 21:Mode1+3+5 22:Mode2+3+5 23:Mode1+2+3+5 24:Mode4+5 25:Mode1+4+5 26:Mode2+4+5 27:Mode1+2+4+5 28:Mode3+4+5 29:Mode1+3+4+5 30:Mode2+3+4+5 31:Mode1+2+3+4+5	Bitmask to enable Super Simple mode for some flight modes. Setting this to Disabled(0) will disable Super Simple Mode
SYSID_MYGCS	255		255:Mission Planner and DroidPlanner 252: AP Planner 2	Allows restricting radio overrides to only come from my ground station

SYSID_SW_MREV	120			This value is incremented when changes are made to the eeprom
SYSID_SW_TYPE	10		0:ArduPlane 4:AntennaTracker 10:Copter 20:Rover	This is used by the ground station to recognise the software type (eg ArduPlane vs ArduCopter)
SYSID_THISMAV	1		1 255	Allows setting an individual MAVLink system id for this vehicle to distinguish it from others on the same network
TELEM_DELAY	0	seconds	0 10	The amount of time (in seconds) to delay radio telemetry to prevent an Xbee bricking on power up
TERRAIN_ENABLE	1		0:Disable 1:Enable	enable terrain data. This enables the vehicle storing a database of terrain data on the SD card. The terrain data is requested from the ground station as needed, and stored for later use on the SD card. To be useful the ground station must support TERRAIN_REQUEST messages and have access to a terrain database, such as the SRTM
TERRAIN_FOLLOW	0			
TERRAIN_SPACING	100	meters		Distance between terrain grid points in meters. This controls the horizontal resolution of the terrain data that is stored on te SD card and requested from the ground station. If your GCS is using the worldwide SRTM database then a resolution of 100 meters is appropriate. Some parts of the world may have higher resolution data available, such as 30 meter data available in the SRTM database in the USA. The grid spacing also controls how much data is kept in memory during flight. A larger grid spacing will allow for a larger amount of data in memory. A grid spacing of 100 meters results in the vehicle keeping 12 grid squares in memory with each grid square having a size of 2.7 kilometers by 3.2 kilometers. Any additional grid squares are stored on the SD once they are fetched from the GCS
THR_DZ	100	pwm	0 300	The deadzone above and below mid throttle. Used in AltHold, Loiter, PosHold flight modes
THROW_MOT_START	0			
THROW_NEXTMODE	18			
THROW_TYPE	0			
TUNE	0		0:None 1:Stab Roll/Pitch kP 4:Rate Roll/Pitch kP 5:Rate Roll/Pitch kI 21:Rate Roll/Pitch kD 3:Stab Yaw kP 6:Rate Yaw kP 26:Rate Yaw kD 14:Altitude Hold kP 7:Throttle Rate kP 34:Throttle Accel kP 35:Throttle Accel kI 36:Throttle Accel kD 42:Loiter Speed 12:Loiter Pos kP 22:Velocity XY kP 28:Velocity XY kI 10:WP Speed 25:Acro RollPitch kP 40:Acro Yaw kP 13:Heli Ext Gyro 17:OF Loiter kP 18:OF Loiter kI 19:OF Loiter kD 38:Declination 39:Circle Rate 41:RangeFinder Gain 46:Rate Pitch kP 47:Rate Pitch kI 48:Rate Pitch kD	Controls which parameters (normally PID gains) are being tuned with transmitter's channel 6 knob
TUNE_HIGH	1000		0 32767	The maximum value that will be applied to the parameter currently being tuned with the transmitter's channel 6 knob
TUNE_LOW	0		0 32767	The minimum value that will be applied to the parameter currently being tuned with the transmitter's channel 6 knob
VEL_XY_FILT_HZ	5			
VEL_XY_I	0,5		0.02 1.00	Velocity (horizontal) I gain. Corrects long-term difference in desired velocity to a target acceleration
VEL_XY_IMAX	1000	cm/s/s	0 4500	Velocity (horizontal) integrator maximum. Constrains the target acceleration that the I gain will output
VEL_XY_P	1		0.1 6.0	Velocity (horizontal) P gain. Converts the difference between desired velocity to a target acceleration
VEL_Z_P	5		1.000 8.000	Velocity (vertical) P gain. Converts the difference between desired vertical speed and actual speed into a desired acceleration that is passed to the throttle acceleration controller
WP_NAVALT_MIN	0			

WP_YAW_BEHAVIOR	0		0:Never change yaw 1:Face next waypoint 2:Face next waypoint except RTL 3:Face along GPS course	Determines how the autopilot controls the yaw during missions and RTL
WPNAV_ACCEL	100	cm/s/s	50 500	Defines the horizontal acceleration in cm/s/s used during missions
WPNAV_ACCEL_Z	100	cm/s/s	50 500	Defines the vertical acceleration in cm/s/s used during missions
WPNAV_LOIT_JERK	1000	cm/s/s/s	5 002 000	Loiter maximum jerk in cm/s/s/s
WPNAV_LOIT_MAXA	250	cm/s/s	100 981	Loiter maximum acceleration in cm/s/s. Higher values cause the copter to accelerate and stop more quickly.
WPNAV_LOIT_MINA	25	cm/s/s	100 981	Loiter minimum acceleration in cm/s/s. Higher values stop the copter more quickly when the stick is centered, but cause a larger jerk when the copter stops.
WPNAV_LOIT_SPEED	200	cm/s	0 2000	Defines the maximum speed in cm/s which the aircraft will travel horizontally while in loiter mode
WPNAV_RADIUS	100	cm	1 001 000	Defines the distance from a waypoint, that when crossed indicates the wp has been hit.
WPNAV_RFND_USE	1			
WPNAV_SPEED	200	cm/s	0 2000	Defines the speed in cm/s which the aircraft will attempt to maintain horizontally during a WP mission
WPNAV_SPEED_DN	80	cm/s	0 500	Defines the speed in cm/s which the aircraft will attempt to maintain while descending during a WP mission
WPNAV_SPEED_UP	100	cm/s	0 1000	Defines the speed in cm/s which the aircraft will attempt to maintain while climbing during a WP mission