INS Input Interface

IMU_Bus Interface (500Hz)

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp in ms
float	gyr_x_radPs_B	rad/s	roll rate
float	gyr_y_radPs_B	rad/s	pitch rate
float	gyr_z_radPs_B	rad/s	yaw rate
float	acc_x_mPs2_B	m/s2	acceleration in x
float	acc_y_mPs2_B	m/s2	acceleration in y
float	acc_z_mPs2_B	m/s2	acceleration in z

Mag_Bus Interface (100Hz)

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp in ms
float	mag_x_ga_B	gauss	magnetic field in x
float	mag_y_ga_B	gauss	magnetic field in y
float	mag_z_ga_B	gauss	magnetic field in z

MS5611_Bus Interface (100Hz)

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp in ms
float	pressure_pa	Pa	air pressure in Pa
float	temp_deg	degree	temperature in degree

uBlox_PVT_Bus Interface (10Hz)

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp in ms
uint32	iTOW	ms	GPS time of week
uint16	year	year	Year(UTC)
uint8	month	month	Month

Type	Name	Unit	Comments
uint8	day	day	Day of month
uint8	hour	hour	Hour of day
uint8	min	minute	Minute of hour
uint8	sec	second	Seconds of minute
uint8	valid	-	Valid flags
uint32	tAcc	ns	TIme accurancy estimate
int32	nano	ns	Fraction of second
uint8	fixType	-	GNSSfox Type
uint8	flags	-	Fix status flags
uint8	reserved1	-	Reserved
uint8	numSV	-	Number of available satelites
int32	lon	1e7 deg	Lontitude
int32	lat	1e7 deg	Latitude
int32	height	mm	Height above Elipsoid
int32	hMSL	mm	Height above mean sea level
uint32	hAcc	mm	Horizontal accurancy
uint32	vAcc	mm	Vertical accurancy
int32	velN	mm/s	NED north velocity
int32	velE	mm/s	NED east velocity
int32	velD	mm/s	NED down velocity
int32	gSpeed	mm/s	Ground speed
int32	headMot	1e5 deg	Heading of motion
uint32	sAcc	mm/s	Speed accurancy
uint32	headAcc	1e5 deg	Heading accurancy
uint16	pDOP	1e2 deg	Position DOP
uint16	reserved2	-	Reserved

INS Output Interface

INS_Out_Bus Interface (800Hz)

Type	Name	Unit	Comments

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp of INS output
single	roll	rad	roll angle
single	pitch	rad	pitch angle
single	yaw	rad	yaw angle
single	p	rad/s	roll rate
single	q	rad/s	pitch rate
single	r	rad/s	yaw rate
single	acc_x	m/s^2	specific force in x
single	acc_y	m/s^2	specific force in y
single	acc_z	m/s^2	specific force in z
single	velN	m/s	WGS84 north velocity
single	velE	m/s	WGS84 east velocity
single	velD	m/s	WGS84 down velocity
double	longitude	deg	WGS84 longitude
double	latitude	deg	WGS84 latitude
double	altitude	m	WGS84 altitude

Controller Input Interface

Type	Name	Unit	Comments
FMS_Output	FMS_Output	-	FMS Output Interface
INS_Output	INS_Output	-	INS Output Interface

Controller Output Interface

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp of Controller output
uint16	pwm_cmd	[1000 2000]	dimension: [8 1], pwm command for motors, valid if arm=1

FMS Input Interface

Pilot_Cmd

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp of pilot command

Type	Name	Unit	Comments
single	ls_lr	[-1 1]	left stick value of left/right
single	ls_ud	[-1 1]	left stick value of up/down
single	rs_lr	[-1 1]	right stick value of left/right
single	rs_ud	[-1 1]	right stick value of up/down
uint32	mode	-	flight mode, 0: attitude 1: altitude hold 2: autonomous
uint32	command_1	-	command signal 1
uint32	command_2	-	command signal 2

GCS_Cmd

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp of ground control station (GCS) command

FMS Output Interface

Type	Name	Unit	Comments
uint32	timestamp_ms	ms	timestamp of FMS output
single	p_cmd_radPs	rad/s	roll rate command
single	q_cmd_radPs	rad/s	pitch rate command
single	r_cmd_radPs	rad/s	yaw rate command
single	phi_cmd_rad	rad	roll command
single	theta_cmd_rad	rad	pitch command
single	psi_cmd_rad	rad	yaw command
single	u_cmd_B_mPs	m/s	velocity x command for outter controller in body frame
single	v_cmd_B_mPs	m/s	velocity y command for outter controller in body frame
single	w_cmd_B_mPs	m/s	velocity z command for outter controller in body frame
uint32	throttle_cmd	[1000 2000]	base throttle command if pos_mode = 0
uint16	pwm_cmd	[1000 2000]	dimension: [8 1], pwm command for motors, valid if arm=0
uint32	reset	-	reset the controller
uint32	arm	-	arm status
uint8	att_mode	-	roll/pitch control mode, valid only if pos_mode != 2: 0: rate control 1: angle control

Type	Name	Unit	Comments
uint8	yaw_mode	-	yaw control mode: 0: rate control 1: angle control
uint8	pos_mode	-	position control mode: 0: no control 1: z velocity control 2: full velocity control
uint8	reserved	-	reserved for 32bit allighment