4.2.6 BeiDou Decoded Message Blocks

BDSNav	Number: 4081 "OnChange" interval: block generated each time a new navigation data set is received from a BeiDou satellite

The BDSNav block contains the decoded navigation data for one BeiDou satellite, as received from the D1 or D2 nav message.

Parameter	Type	Units	Do-Not-Use	Description
Sync1	c1			Block Header, see 4.1.1
Sync2	c1			
CRC	u2			
ID	u2			
Length	u2	1 byte		
TOW	u4	0.001 s	4294967295	SIS time stamp, see 4.1.3
WNc	u2	1 week	65535	
PRN	u1			ID of the BeiDou satellite of which the ephemeris is given in this block (see 4.1.9)
Reserved	u1			Reserved for future use, to be ignored by decoding software
WN	u2	1 week		BeiDou week number as received from the navigation message (from 0 to 8191)
URA	u1			User range accuracy index (4-bit value)
SatH1	u1			1-bit autonomous health
IODC	u1			Age of data, clock (5 bits)
IODE	u1			Age of data, ephemeris (5 bits)
Reserved2	u2			unused, to be ignored by decoding software
T_GD1	f4	1 s		B1I equipment group delay differential
T_GD2	f4	1 s	$-2 \cdot 10^{10}$	B2I equipment group delay differential (set to the Do-Not-Use value when unknown)
t_oc	u4	1 s		clock data reference time, in BeiDou system time (lagging GPS time by 14 seconds).
a_f2	f4	1 s / s^2		SV clock aging
a_f1	f4	1 s / s		SV clock drift
a_f0	f4	1 s		SV clock bias
C_rs	f4	1 m		Amplitude of the sine harmonic correction term to the orbit radius
DEL_N	f4	1 semi-circle / s		Mean motion difference from computed value
M_0	f8	1 semi-circle		Mean anomaly at reference time
C_uc	f4	1 rad		Amplitude of the cosine harmonic correction term to the argument of latitude
e	f8			Eccentricity
C_us	f4	1 rad		Amplitude of the sine harmonic correction term to the argument of latitude
SQRT_A	f8	1 $m^{1/2}$		Square root of the semi-major axis
t_oe	u4	1 s		Reference time ephemeris, in BeiDou system time (lagging GPS time by 14 seconds).
C_ic	f4	1 rad		Amplitude of the cosine harmonic correction term to the angle of inclination
OMEGA_0	f8	1 semi-circle		Longitude of ascending node of orbit plane at weekly epoch

C_is	f4	1 rad		Amplitude of the sine harmonic correction term to the angle of inclination
i_0	f8	1 semi-circle		Inclination angle at reference time
C_rc	f4	1 m		Amplitude of the cosine harmonic correction term to the orbit radius
omega	f8	1 semi-circle		Argument of perigee
OMEGADOT	f4	1 semi-circle / s		Rate of right ascension
IDOT	f4	1 semi-circle / s		Rate of inclination angle
WNt_oc	u2	1 week		BeiDou week number associated with t_oc, modulo 8192. Note that this value relates to the BeiDou system time.
WNt_oe	u2	1 week		BeiDou week number associated with t_oe, modulo 8192. Note that this values relates to the BeiDou system time.
Padding	u1[..]			Padding bytes, see 4.1.5

BDSAlm	Number: 4119 "OnChange" interval: block generated each time a new almanac data set is received from a BeiDou satellite

The BDSAlm block contains the decoded almanac data for one BeiDou satellite.

Parameter	Type	Units	Do-Not-Use	Description
Sync1	c1			Block Header, see 4.1.1
Sync2	c1			
CRC	u2			
ID	u2			
Length	u2	1 byte		
TOW	u4	0.001 s	4294967295	SIS time stamp, see 4.1.3
WNc	u2	1 week	65535	
PRN	u1			ID of the BeiDou satellite of which the almanac is given in this block (see 4.1.9)
WN_a	u1	1 week		Almanac week number
t_oa	u4	1 s		Almanac reference time
SQRT_A	f4	1 $m^{1/2}$		Square root of the semi-major axis
e	f4			Eccentricity
omega	f4	1 semi-circle		Argument of perigee
M_0	f4	1 semi-circle		Mean anomaly at reference time
OMEGA_0	f4	1 semi-circle		Longitude of ascending node of orbital plane computed according to reference time
OMEGADOT	f4	1 semi-circle / s		Rate of right ascension
delta_i	f4	1 semi-circle		Correction of orbit reference inclination at reference time
a_f0	f4	1 s		Satellite clock bias
a_f1	f4	1 s / s		Satellite clock drift
Health	u2			Satellite health information (9 bits)
Reserved	u1[2]			Reserved for future use, to be ignored by decoding software
Padding	u1[..]			Padding bytes, see 4.1.5

BDSIon	Number: 4120 "OnChange" interval: output each time the ionospheric parameters are received from a BeiDou satellite

The BDSIon block contains the BeiDou ionosphere data (the Klobuchar coefficients), as received from the D1 or D2 nav message.

Parameter	Type	Units	Do-Not-Use	Description
Sync1	c1			Block Header, see 4.1.1
Sync2	c1			
CRC	u2			
ID	u2			
Length	u2	1 byte		
TOW	u4	0.001 s	4294967295	SIS time stamp, see 4.1.3
WNc	u2	1 week	65535	
PRN	u1			ID of the BeiDou satellite from which the coefficients have been received (see 4.1.9)
Reserved	u1			Reserved for future use, to be ignored by decoding software
alpha_0	f4	1 s		vertical delay coefficient 0
alpha_1	f4	1 s / semi-circle		vertical delay coefficient 1
alpha_2	f4	1 s / semi-circle^2		vertical delay coefficient 2
alpha_3	f4	1 s / semi-circle^3		vertical delay coefficient 3
beta_0	f4	1 s		model period coefficient 0
beta_1	f4	1 s / semi-circle		model period coefficient 1
beta_2	f4	1 s / semi-circle^2		model period coefficient 2
beta_3	f4	1 s / semi-circle^3		model period coefficient 3
Padding	u1[..]			Padding bytes, see 4.1.5

BDSUtc	Number: 4121 "OnChange" interval: output each time the UTC offset parameters are received from a BeiDou satellite

The BDSUtc block contains the BeiDou UTC data, as received from the D1 or D2 nav message.

Note that BDT (BeiDou time) started on January 1st, 2006 (GPS week 1356). Therefore the delta time between BDT and UTC due to leap seconds is 14 less than the value in GPSUtc.

Parameter	Type	Units	Do-Not-Use	Description
Sync1	c1			Block Header, see 4.1.1
Sync2	c1			
CRC	u2			
ID	u2			
Length	u2	1 byte		
TOW	u4	0.001 s	4294967295	SIS time stamp, see 4.1.3
WNc	u2	1 week	65535	
PRN	u1			ID of the BeiDou satellite from which the coefficients have been received (see 4.1.9)
Reserved	u1			Reserved for future use, to be ignored by decoding software
A_1	f4	1 s / s		first order term of polynomial
A_0	f8	1 s		constant term of polynomial
DEL_t_LS	i1	1 s		Delta time due to leap seconds whenever the effectivity time is not in the past
WN_LSF	u1	1 week		Effectivity time of leap second (week)
DN	u1	1 day		Effectivity time of leap second (day, from 0 to 6)
DEL_t_LSF	i1	1 s		Delta time due to leap seconds whenever the effectivity time is in the past
Padding	u1[..]			Padding bytes, see 4.1.5