Byte position	Bit Position	Value	Length [bits]	Description / Example	Conversion	Physical unit
0	0	ASM (attached synchronisation marker)	32	0x1ACFFC1D		
4	0	TFVN (transfer frame version number)	2	0		
4	2	SCID (spacecraft Identifier)	10	0xBE		
5	4	VCID (virtual channel Identifier)	3	0x0..0x7		
5	7	OCFF (operational control field flag)	1	0		
6	0	MCFC (master channel frame count)	8	0..255		
7	0	VCFC (virtual channel frame count)	8	0..255		
8	0	TF_SHF (TF secondary header flag)	1	0		
8	1	synchronisation flag	1	0		
8	2	POF (packet order flag)	1	0		
8	3	SLID (segment length identifier)	2	0x3		
8	5	FHP (first header pointer)	11	0x0		
10	0	PVN (packet version number)	3	0x0		
10	3	PT (packet type)	1	0		
10	4	SHF (secondary header flag)	1	0		
10	5	APID (application process identifier)	11	0x0..0x7FF		
12	0	sequence flag	2	0x0..0x3		
12	2	PSC (packet sequence control)	14	0x0..0x3FFF		
14	0	PDL (packet data length)	16	0x007F		
16	0	analog value #1	12	Voltage solar array	0,001620 · value	V
17	4	PSANT0	1	Power state antenna release mechanism #0	-	On / Off
17	5	PSANT1	1	Power state antenna release mechanism #1	-	On / Off
17	6	PSCOM0	1	inactive!		
17	7	PSCOM1	1	inactive!		
18	0	analog value #2	12	Voltage battery #0	0,003373 · value	V
19	4	PSUHF0	1	Power state TRX #0	-	On / Off
19	5	PSUHF1	1	Power state TRX #1	-	On / Off
19	6	PSTNC0	1	Power state TNC #0	-	On / Off
19	7	PSTNC1	1	Power state TNC #1	-	On / Off
20	0	analog value #3	12	Voltage battery #1	0,003373 · value	V
21	4	PSGYRO	1	Power state gyro System	-	On / Off
21	5	PSMCSX	1	Power state magnetic coil system x	-	On / Off
21	6	PSMCSY	1	Power state magnetic coil system y	-	On / Off

21	7	PSMCSZ	1	Power state magnetic coil system z	-	On / Off
22	0	analog value #4	12	Voltage bus 5V	0,001620 · value	V
23	4	PSWHEE	1	Power state wheel system	-	On / Off
23	5	PSOBC0	1	Power state OBC #0	-	On / Off
23	6	PSOBC1	1	Power state OBC #1	-	On / Off
23	7	PSPDH0	1	Power state PHD	-	On / Off
24	0	analog value #5	12	Voltage bus 3.3V	0,001221 · value	V
25	4	PSCAM0	1	Power state payload camera	-	On / Off
25	5	PSSUNS	1	Power state sun sensor system	-	On / Off
25	6	PSMFS0	1	Power state magnetic field sensor system #0	-	On / Off
25	7	PSMFS1	1	Power state magnetic field sensor system #1	-	On / Off
26	0	analog value #6	12	Current charger #0 output	0,610352 · value	mA
27	4	PSTEMP	1	Power state temperature sensors	-	On / Off
27	5	PSCAN0	1	Power state CAN bus #0	-	On / Off
27	6	PSCAN1	1	Power state CAN bus #1	-	On / Off
27	7	PSCCW0	1	Power state WDE can controller #0	-	On / Off
28	0	analog value #7	12	Current charger #1 output	0,610352 · value	mA
29	4	PSCCW1	1	Power state WDE can controller #1	-	On / Off
29	5	PS5VCN	1	Power state 5V main switch	-	On / Off
29	6	reserved	1			
29	7	PCBOBC	1	startup OBDH Id	-	0 / 1
30	0	analog value #8	12	Temperature battery #0	0,244141 · value - 50	°C
31	4	PCBEXT	1	boot external flash	-	0 / 1
31	5	PCCH00	1	PCDU check channel 00	-	On / Off
31	6	PCCH01	1	PCDU check channel 01	-	On / Off
31	7	PCCH02	1	PCDU check channel 02	-	On / Off
32	0	analog value #9	12	Temperature battery #1	0,244141 · value - 50	°C
33	4	PCCH03	1	PCDU check channel 03	-	On / Off
33	5	PCCH04	1	PCDU check channel 04	-	On / Off
33	6	PCCH05	1	PCDU check channel 05	-	On / Off
33	7	PCCH06	1	PCDU check channel 06	-	On / Off
34	0	analog value #10	12	signal strength TNC #0	1	S-meter
35	4	PCCH07	1	PCDU check channel 07	-	On / Off
35	5	PCCH08	1	PCDU check channel 08	-	On / Off
35	6	PCCH09	1	PCDU check channel 09	-	On / Off
35	7	PCCH10	1	PCDU check channel 10	-	On / Off

36	0	analog value #11	12	signal strength TNC #1	1	S-meter
37	4	PCCH11	1	PCDU check channel 11	-	On / Off
37	5	PCCH12	1	PCDU check channel 12	-	On / Off
37	6	PCCH13	1	PCDU check channel 13	-	On / Off
37	7	PCCH14	1	PCDU check channel 14	-	On / Off
38	0	analog value #12	12	Current wheel drive electronics	0,305176 · value	mA
39	4	PCCH15	1	PCDU check channel 15	-	On / Off
39	5	PCCH16	1	PCDU check channel 16	-	On / Off
39	6	PCCH17	1	PCDU check channel 17	-	On / Off
39	7	PCCH18	1	PCDU check channel 18	-	On / Off
40	0	analog value #13	12	Temperature wheel X	0,061035 · value - 50	°C
41	4	PCCH19	1	PCDU check channel 19	-	On / Off
41	5	PCCH20	1	PCDU check channel 20	-	On / Off
41	6	PCCH21	1	PCDU check channel 21	-	On / Off
41	7	PCCH22	1	PCDU check channel 22	-	On / Off
42	0	analog value #14	12	Temperature wheel Y	0,061035 · value - 50	°C
43	4	PCCH23	1	PCDU check channel 23	-	On / Off
43	5	PCCH24	1	PCDU check channel 24	-	On / Off
43	6	PCCH25	1	PCDU check channel 25	-	On / Off
43	7	PCCH26	1	PCDU check channel 26	-	On / Off
44	0	analog value #15	12	Temperature wheel Z	0,061035 · value - 50	°C
45	4	TCRXID	1	receiving TNC Id	-	0 / 1
45	5	OBCAID	1	active OBDH Id	-	0 / 1
45	6	TMTXRT	1	TX baudrate	4800 · value + 4800	bps
45	7	PCCH27	1	PCDU check channel 27	-	On / Off
46	0	analog value #16	12	Current charger #0 input	0,305176 · value	mA
47	4	PCCH28	1	PCDU check channel 28	-	On / Off
47	5	PCCH29	1	PCDU check channel 29	-	On / Off
47	6	PCCH30	1	PCDU check channel 30	-	On / Off
47	7	PCCH31	1	PCDU check channel 31	-	On / Off
48	0	CCTICC	8	immediate command counter	value	1
49	0	CCTCTT	8	time tagged command counter	value	1
50	0	CCETCS	8	Error counter: command checksum	value	1
51	0	CCEIMC	8	Error counter: immediate command	value	1
52	0	CCETTC	8	Error counter: time tagged command	value	1
53	0	CCETTG	8	Error counter: time tag	value	1

54	0	CCETCC	8	Error counter: unknown command code	value	1
55	0	TCRXQU	8	receiving TNC quality byte	0,054878 · value + 1,573172	dB
56	0	TCFRCP	16	free command pool	value	1
58	0	TMHKUR	16	housekeeping update rate	value	seconds
60	0	CSTUTC	32	on board time in utc	value	seconds
64	0	CSTSYS	32	obc uptime	value	seconds
68	0	OBCBAD	8	boot address	-	0 / 1 / 2 / 3
69	0	CESWMC	8	error counter for missing magic code	value	1
70	0	reserved	8			
71	0	BEACON	8	beacon mode	-	On / Off
72	0	OBCABC	8	active OBDH boot counter	value	1
73	0	MODOBC	8	Satellite mode	value	1
74	0	CCECAN	8	CAN error counter	value	
75	0	OBCCAN	8	CAN bus ID	-	0 / 1
76	0	PCSYST	16	PCDU uptime	value	seconds
78	0	PCBCNT	8	PCDU boot counter	value	1
79	0	PCTXEC	8	PCDU CAN msg transmit error counter	value	1
80	0	PCRXEC	8	PCDU CAN msg receive error counter	value	1
81	0	PCOFFC	8	PCDU CAN bus offline error counter	value	1
82	0	PCACKC	8	PCDU CAN bus acknowledge error counter	value	1
83	0	PCCH32	1	PCDU check channel 32	-	On / Off
83	1	PCCH33	1	PCDU check channel 33	-	On / Off
83	2	PCCH34	1	PCDU check channel 34	-	On / Off
83	3	PCCH35	1	PCDU check channel 35	-	On / Off
83	4	PCCH36	1	PCDU check channel 36	-	On / Off
83	5	PCCH37	1	PCDU check channel 37	-	On / Off
83	6	PCCH38	1	PCDU check channel 38	-	On / Off
83	7	PCCH39	1	PCDU check channel 39	-	On / Off
84	0	PCCH40	1	PCDU check channel 40	-	On / Off
84	1	PCCH41	1	PCDU check channel 41	-	On / Off
84	2..7	reserved	14			
86	0	analog value #17	12	Current charger #1 input	0,305176 · value	mA
87	4	reserved	4			
88	0	analog value #18	12	Temperature PCDU ext. ADC #0	0,125 · value	°C
89	4	reserved	4			
90	0	analog value #19	12	Temperature magnetic field sensor #0	0,061035 · value - 50	°C

91	4..7	reserved	4			
92	0	ACSWHX	16	Reaction wheel speed X	value	rpm
94	0	ACSWHY	16	Reaction wheel speed Y	value	rpm
96	0	ACSWHZ	16	Reaction wheel speed Z	value	rpm
98	0	ACSQ00	16	ACS quaternion 00	0,0001 · value	1
100	0	ACSQ01	16	ACS quaternion 01	0,0001 · value	1
102	0	ACSQ02	16	ACS quaternion 02	0,0001 · value	1
104	0	ACSQ03	16	ACS quaternion 03	0,0001 · value	1
106	0	ACSSUX	16	ACS sun vector X	0,0001 · value	1
108	0	ACSSUY	16	ACS sun vector Y	0,0001 · value	1
110	0	ACSSUZ	16	ACS sun vector Z	0,0001 · value	1
112	0	ACSM0X	16	ACS magnetic field sensor 0 vector X	10 · value	nT
114	0	ACSM0Y	16	ACS magnetic field sensor 0 vector Y	10 · value	nT
116	0	ACSM0Z	16	ACS magnetic field sensor 0 vector Z	10 · value	nT
118	0	ACSM1X	16	ACS magnetic field sensor 1 vector X	10 · value	nT
120	0	ACSM1Y	16	ACS magnetic field sensor 1 vector Y	10 · value	nT
122	0	ACSM1Z	16	ACS magnetic field sensor 1 vector Z	10 · value	nT
124	0	ACSMOD	4	ACS mode	value	1
124	4	ACSGSC	1	ground station contact flag	-	0 / 1
124	5	ACSSHD	1	shadow flag	-	0 / 1
124	6..7	reserved	2			
125	0	ACSERR	8	ACS Error Code	value	1
126	0	ACSGYX	16	Gyro rate X	0,0573 · value + 19,7097	deg/s
128	0	ACSGYY	16	Gyro rate Y	-0,0573 · value + 21,9443	deg/s
130	0	ACSGYZ	16	Gyro rate Z	-0,0573 · value + 2,5210	deg/s
132	0	analog value #20	12	Temperature OBC ext. ADC #0	0,125 · value	°C
133	4	reserved	4			
134	0	analog value #21	12	Current solar array x+	0,152588 · value	mA
135	4..7	reserved	4			
136	0	analog value #22	12	Current solar array y+	0,152588 · value	mA
137	4..7	reserved	4			
138	0	analog value #23	12	Current solar array z+	0,152588 · value	mA
139	4..7	reserved	4			
140	0	analog value #24	12	Temperature Gyro rate X	0,48577 · value - 270,595	°C
141	4..7	reserved	4			
142	0	FECF	16	frame error control field (CCSDS)	-	-

144	0	ASM (attached synchronisation marker)	32	0x1ACFFC1D		
148	0	TFVN (transfer frame version number)	2	0		
148	2	SCID (spacecraft Identifier)	10	0xBE		
149	4	VCID (virtual channel Identifier)	3	0x0..0x7		
149	7	OCFF (operational control field flag)	1	0		
150	0	MCFC (master channel frame count)	8	0..255		
151	0	VCFC (virtual channel frame count)	8	0..255		
152	0	TF_SHF (TF secondary header flag)	1	0		
152	1	synchronisation flag	1	0		
152	2	POF (packet order flag)	1	0		
152	3	SLID (segment length identifier)	2	0x3		
152	5	FHP (first header pointer)	11	0x0		
154	0	PVN (packet version number)	3	0x0		
154	3	PT (packet type)	1	0		
154	4	SHF (secondary header flag)	1	0		
154	5	APID (application process identifier)	11	0x0..0x7FF		
156	0	sequence flag	2	0x0..0x3		
156	2	PSC (packet sequence control)	14	0x0..0x3FFF		
158	0	PDL (packet data length)	16	0x007F		
160	0	analog value #1	12	Voltage solar array	0,001620 · value	V
161	4	PSANT0	1	Power state antenna release mechanism #0	-	On / Off
161	5	PSANT1	1	Power state antenna release mechanism #1	-	On / Off
161	6	PSCOM0	1	inactive!		
161	7	PSCOM1	1	inactive!		
162	0	analog value #2	12	Voltage battery #0	0,003373 · value	V
163	4	PSUHF0	1	Power state TRX #0	-	On / Off
163	5	PSUHF1	1	Power state TRX #1	-	On / Off
163	6	PSTNC0	1	Power state TNC #0	-	On / Off
163	7	PSTNC1	1	Power state TNC #1	-	On / Off
164	0	analog value #3	12	Voltage battery #1	0,003373 · value	V
165	4	PSGYRO	1	Power state gyro System	-	On / Off
165	5	PSMCSX	1	Power state magnetic coil system x	-	On / Off
165	6	PSMCSY	1	Power state magnetic coil system y	-	On / Off
165	7	PSMCSZ	1	Power state magnetic coil system z	-	On / Off
166	0	analog value #4	12	Voltage bus 5V	0,001620 · value	V
167	4	PSWHEE	1	Power state wheel system	-	On / Off

167	5	PSOBC0	1	Power state OBC0	-	On / Off
167	6	PSOBC1	1	Power state OBC1	-	On / Off
167	7	PSPDH0	1	Power state PHD	-	On / Off
168	0	analog value #5	12	Voltage bus 3.3V	0,001221 · value	V
169	4	PSCAM0	1	Power state payload camera	-	On / Off
169	5	PSSUNS	1	Power state sun sensor system	-	On / Off
169	6	PSMFS0	1	Power state magnetic field sensor system #0	-	On / Off
169	7	PSMFS1	1	Power state magnetic field sensor system #1	-	On / Off
170	0	analog value #6	12	Current charger #0 output	0,610352 · value	mA
171	4	PSTEMP	1	Power state temperature sensors	-	On / Off
171	5	PSCAN0	1	Power state CAN bus #0	-	On / Off
171	6	PSCAN1	1	Power state CAN bus #1	-	On / Off
171	7	PSCCW0	1	Power state WDE can controller #0	-	On / Off
172	0	analog value #7	12	Current charger #1 output	0,610352 · value	mA
173	4	PSCCW1	1	Power state WDE can controller #1	-	On / Off
173	5	PS5VCN	1	Power state 5V main switch	-	On / Off
173	6	PCUAID	1	active PCDU Id		
173	7	PCBOBC	1	startup OBDH Id	-	0 / 1
174	0	analog value #8	12	Temperature battery #0	0,244141 · value - 50	°C
175	4	PCBEXT	1	boot external flash	-	0 / 1
175	5	PCCH00	1	PCDU check channel 00	-	On / Off
175	6	PCCH01	1	PCDU check channel 01	-	On / Off
175	7	PCCH02	1	PCDU check channel 02	-	On / Off
176	0	analog value #9	12	Temperature battery #1	0,244141 · value - 50	°C
177	4	PCCH03	1	PCDU check channel 03	-	On / Off
177	5	PCCH04	1	PCDU check channel 04	-	On / Off
177	6	PCCH05	1	PCDU check channel 05	-	On / Off
177	7	PCCH06	1	PCDU check channel 06	-	On / Off
178	0	analog value #10	12	signal strength TNC #0	1	S-meter
179	4	PCCH07	1	PCDU check channel 07	-	On / Off
179	5	PCCH08	1	PCDU check channel 08	-	On / Off
179	6	PCCH09	1	PCDU check channel 09	-	On / Off
179	7	PCCH10	1	PCDU check channel 10	-	On / Off
180	0	analog value #11	12	signal strength TNC #1	1	S-meter
181	4	PCCH11	1	PCDU check channel 11	-	On / Off
181	5	PCCH12	1	PCDU check channel 12	-	On / Off

181	6	PCCH13	1	PCDU check channel 13	-	On / Off
181	7	PCCH14	1	PCDU check channel 14	-	On / Off
182	0	analog value #12	12	Current wheel drive electronics	0,305176 · value	mA
183	4	PCCH15	1	PCDU check channel 15	-	On / Off
183	5	PCCH16	1	PCDU check channel 16	-	On / Off
183	6	PCCH17	1	PCDU check channel 17	-	On / Off
183	7	PCCH18	1	PCDU check channel 18	-	On / Off
184	0	analog value #13	12	Temperature wheel X	0,061035 · value - 50	°C
185	4	PCCH19	1	PCDU check channel 19	-	On / Off
185	5	PCCH20	1	PCDU check channel 20	-	On / Off
185	6	PCCH21	1	PCDU check channel 21	-	On / Off
185	7	PCCH22	1	PCDU check channel 22	-	On / Off
186	0	analog value #14	12	Temperature wheel Y	0,061035 · value - 50	°C
187	4	PCCH23	1	PCDU check channel 23	-	On / Off
187	5	PCCH24	1	PCDU check channel 24	-	On / Off
187	6	PCCH25	1	PCDU check channel 25	-	On / Off
187	7	PCCH26	1	PCDU check channel 26	-	On / Off
188	0	analog value #15	12	Temperature wheel Z	0,061035 · value - 50	°C
189	4	TCRXID	1	receiving TNC Id	-	0 / 1
189	5	OBCAID	1	active OBDH Id	-	0 / 1
189	6	TMTXRT	1	TX baudrate	4800 · value + 4800	bps
189	7	PCCH27	1	PCDU check channel 27	-	On / Off
190	0	analog value #16	12	Current charger #0 input	0,305176 · value	mA
191	4	PCCH28	1	PCDU check channel 28	-	On / Off
191	5	PCCH29	1	PCDU check channel 29	-	On / Off
191	6	PCCH30	1	PCDU check channel 30	-	On / Off
191	7	PCCH31	1	PCDU check channel 31	-	On / Off
192	0	CCTICC	8	immediate command counter	value	1
193	0	CCTCTT	8	time tagged command counter	value	1
194	0	CCETCS	8	command checksum error counter	value	1
195	0	CCEIMC	8	immediate command error counter	value	1
196	0	CCETTC	8	time tagged command error counter	value	1
197	0	CCETTG	8	time tag error counter	value	1
198	0	CCETCC	8	command code error counter	value	1
199	0	TCRXQU	8	receiving TNC quality byte	0,054878 · value + 1,573172	dB
200	0	TCFRCP	16	free command pool	value	1

202	0	TMHKUR	16	housekeeping update rate	value	seconds
204	0	CSTUTC	32	on board time in utc	value	seconds
208	0	CSTSYS	32	obc uptime	value	seconds
212	0	OBCBAD	8	boot address	-	0 / 1 / 2 / 3
213	0	CESWMC	8	error counter for missing magic code	value	1
214	0	reserved	8			
215	0	BEACON	8	beacon mode	-	On / Off
216	0	OBCABC	8	active OBDH boot counter	value	1
217	0	MODOBC	8	Satellite mode	value	1
218	0	CCECAN	8	CAN error counter	value	
219	0	OBCCAN	8	selected CAN bus at active OBDH	-	0 / 1
220	0	PCSYST	16	PCDU uptime	value	seconds
222	0	PCBCNT	8	PCDU boot counter	value	1
223	0	PCTXEC	8	PCDU CAN transmitt error counter	value	1
224	0	PCRXEC	8	PCDU CAN receive error counter	value	1
225	0	PCOFFC	8	PCDU CAN offline error counter	value	1
226	0	PCACKC	8	PCDU CAN acknowledge error counter	value	1
227	0	PCCH32	1	PCDU check channel 32	-	On / Off
227	1	PCCH33	1	PCDU check channel 33	-	On / Off
227	2	PCCH34	1	PCDU check channel 34	-	On / Off
227	3	PCCH35	1	PCDU check channel 35	-	On / Off
227	4	PCCH36	1	PCDU check channel 36	-	On / Off
227	5	PCCH37	1	PCDU check channel 37	-	On / Off
227	6	PCCH38	1	PCDU check channel 38	-	On / Off
227	7	PCCH39	1	PCDU check channel 39	-	On / Off
228	0	PCCH40	1	PCDU check channel 40	-	On / Off
228	1	PCCH41	1	PCDU check channel 41	-	On / Off
228	2..7	reserved	14			
230	0	analog value #17	12	Current charger #1 input	0,305176 · value	mA
231	4	reserved	4			
232	0	analog value #18	12	Temperature PCDU ext. ADC #0	0,125 · value	°C
233	4	reserved	4			
234	0	analog value #19	12	Temperature MFS0	0,061035 · value - 50	°C
235	4..7	reserved	4			
236	0	ACSWHX	16	wheel speed X	value	rpm
238	0	ACSWHY	16	wheel speed Y	value	rpm

240	0	ACSWHZ	16	wheel speed Z	value	rpm
242	0	ACSQ00	16	ACS quaternion 00	0,0001 · value	1
244	0	ACSQ01	16	ACS quaternion 01	0,0001 · value	1
246	0	ACSQ02	16	ACS quaternion 02	0,0001 · value	1
248	0	ACSQ03	16	ACS quaternion 03	0,0001 · value	1
250	0	ACSSUX	16	ACS sun vector X	0,0001 · value	1
252	0	ACSSUY	16	ACS sun vector Y	0,0001 · value	1
254	0	ACSSUZ	16	ACS sun vector Z	0,0001 · value	1
256	0	ACSM0X	16	ACS magnetic field sensor 0 vector X	10 · value	nT
258	0	ACSM0Y	16	ACS magnetic field sensor 0 vector Y	10 · value	nT
260	0	ACSM0Z	16	ACS magnetic field sensor 0 vector Z	10 · value	nT
262	0	ACSM1X	16	ACS magnetic field sensor 1 vector X	10 · value	nT
264	0	ACSM1Y	16	ACS magnetic field sensor 1 vector Y	10 · value	nT
266	0	ACSM1Z	16	ACS magnetic field sensor 1 vector Z	10 · value	nT
268	0	ACSMOD	4	ACS mode	value	1
268	4	ACSGSC	1	ground station contact	-	0 / 1
268	5	ACSSHD	1	shadow flag	-	0 / 1
268	6..7	reserved	2			
269	0	ACSERR	8	ACS Error Code	value	1
270	0	ACSGYX	16	Gyro rate X	0,0573 · value + 19,7097	deg/s
272	0	ACSGYY	16	Gyro rate Y	-0,0573 · value + 21,9443	deg/s
274	0	ACSGYZ	16	Gyro rate Z	-0,0573 · value + 2,5210	deg/s
276	0	analog value #20	12	Temperature OBC ext. ADC #0	0,125 · value	°C
277	4	reserved	4			
278	0	analog value #21	12	Current solar array x+	0,152588 · value	mA
279	4..7	reserved	4			
280	0	analog value #22	12	Current solar array y+	0,152588 · value	mA
281	4..7	reserved	4			
282	0	analog value #23	12	Current solar array z+	0,152588 · value	mA
283	4..7	reserved	4			
284	0	analog value #24	12	Temperature Gyro rate X	0,48577 · value - 270,595	°C
285	4..7	reserved	4			
286	0	FECF	16	frame error control field (CCSDS)	-	-
288	0	ASM (attached synchronisation marker)	32	0x1ACFFC1D		
292	0	TFVN (transfer frame version number)	2	0		
292	2	SCID (spacecraft Identifier)	10	0xBE		

293	4	VCID (virtual channel Identifier)	3	0x0..0x7		
293	7	OCFF (operational control field flag)	1	0		
294	0	MCFC (master channel frame count)	8	0..255		
295	0	VCFC (virtual channel frame count)	8	0..255		
296	0	TF_SHF (TF secondary header flag)	1	0		
296	1	synchronisation flag	1	0		
296	2	POF (packet order flag)	1	0		
296	3	SLID (segment length identifier)	2	0x3		
296	5	FHP (first header pointer)	11	0x0		
298	0	PVN (packet version number)	3	0x0		
298	3	PT (packet type)	1	0		
298	4	SHF (secondary header flag)	1	0		
298	5	APID (application process identifier)	11	0x0..0x7FF		
300	0	sequence flag	2	0x0..0x3		
300	2	PSC (packet sequence control)	14	0x0..0x3FFF		
302	0	PDL (packet data length)	16	0x007F		
304	0	analog value #1	12	Voltage solar array	0,001620 · value	V
305	4	PSANT0	1	Power state antenna release mechanism #0	-	On / Off
305	5	PSANT1	1	Power state antenna release mechanism #1	-	On / Off
305	6	PSCOM0	1	inactive!		
305	7	PSCOM1	1	inactive!		
306	0	analog value #2	12	Voltage battery #0	0,003373 · value	V
307	4	PSUHF0	1	Power state TRX #0	-	On / Off
307	5	PSUHF1	1	Power state TRX #1	-	On / Off
307	6	PSTNC0	1	Power state TNC #0	-	On / Off
307	7	PSTNC1	1	Power state TNC #1	-	On / Off
308	0	analog value #3	12	Voltage battery #1	0,003373 · value	V
309	4	PSGYRO	1	Power state gyro System	-	On / Off
309	5	PSMCSX	1	Power state magnetic coil system x	-	On / Off
309	6	PSMCSY	1	Power state magnetic coil system y	-	On / Off
309	7	PSMCSZ	1	Power state magnetic coil system z	-	On / Off
310	0	analog value #4	12	Voltage bus 5V	0,001620 · value	V
311	4	PSWHEE	1	Power state wheel system	-	On / Off
311	5	PSOBC0	1	Power state OBC0	-	On / Off
311	6	PSOBC1	1	Power state OBC1	-	On / Off
311	7	PSPDH0	1	Power state PHD	-	On / Off

312	0	analog value #5	12	Voltage bus 3.3V	0,001221 · value	V
313	4	PSCAM0	1	Power state payload camera	-	On / Off
313	5	PSSUNS	1	Power state sun sensor system	-	On / Off
313	6	PSMFS0	1	Power state magnetic field sensor system #0	-	On / Off
313	7	PSMFS1	1	Power state magnetic field sensor system #1	-	On / Off
314	0	analog value #6	12	Current charger #0 output	0,610352 · value	mA
315	4	PSTEMP	1	Power state temperature sensors	-	On / Off
315	5	PSCAN0	1	Power state CAN bus #0	-	On / Off
315	6	PSCAN1	1	Power state CAN bus #1	-	On / Off
315	7	PSCCW0	1	Power state WDE can controller #0	-	On / Off
316	0	analog value #7	12	Current charger #1 output	0,610352 · value	mA
317	4	PSCCW1	1	Power state WDE can controller #1	-	On / Off
317	5	PS5VCN	1	Power state 5V main switch	-	On / Off
317	6	PCUAID	1	active PCDU Id		
317	7	PCBOBC	1	startup OBDH Id	-	0 / 1
318	0	analog value #8	12	Temperature battery #0	0,244141 · value - 50	°C
319	4	PCBEXT	1	boot external flash	-	0 / 1
319	5	PCCH00	1	PCDU check channel 00	-	On / Off
319	6	PCCH01	1	PCDU check channel 01	-	On / Off
319	7	PCCH02	1	PCDU check channel 02	-	On / Off
320	0	analog value #9	12	Temperature battery #1	0,244141 · value - 50	°C
321	4	PCCH03	1	PCDU check channel 03	-	On / Off
321	5	PCCH04	1	PCDU check channel 04	-	On / Off
321	6	PCCH05	1	PCDU check channel 05	-	On / Off
321	7	PCCH06	1	PCDU check channel 06	-	On / Off
322	0	analog value #10	12	signal strength TNC #0	1	S-meter
323	4	PCCH07	1	PCDU check channel 07	-	On / Off
323	5	PCCH08	1	PCDU check channel 08	-	On / Off
323	6	PCCH09	1	PCDU check channel 09	-	On / Off
323	7	PCCH10	1	PCDU check channel 10	-	On / Off
324	0	analog value #11	12	signal strength TNC #1	1	S-meter
325	4	PCCH11	1	PCDU check channel 11	-	On / Off
325	5	PCCH12	1	PCDU check channel 12	-	On / Off
325	6	PCCH13	1	PCDU check channel 13	-	On / Off
325	7	PCCH14	1	PCDU check channel 14	-	On / Off
326	0	analog value #12	12	Current wheel drive electronics	0,305176 · value	mA

327	4	PCCH15	1	PCDU check channel 15	-	On / Off
327	5	PCCH16	1	PCDU check channel 16	-	On / Off
327	6	PCCH17	1	PCDU check channel 17	-	On / Off
327	7	PCCH18	1	PCDU check channel 18	-	On / Off
328	0	analog value #13	12	Temperature wheel X	0,061035 · value - 50	°C
329	4	PCCH19	1	PCDU check channel 19	-	On / Off
329	5	PCCH20	1	PCDU check channel 20	-	On / Off
329	6	PCCH21	1	PCDU check channel 21	-	On / Off
329	7	PCCH22	1	PCDU check channel 22	-	On / Off
330	0	analog value #14	12	Temperature wheel Y	0,061035 · value - 50	°C
331	4	PCCH23	1	PCDU check channel 23	-	On / Off
331	5	PCCH24	1	PCDU check channel 24	-	On / Off
331	6	PCCH25	1	PCDU check channel 25	-	On / Off
331	7	PCCH26	1	PCDU check channel 26	-	On / Off
332	0	analog value #15	12	Temperature wheel Z	0,061035 · value - 50	°C
333	4	TCRXID	1	receiving TNC Id	-	0 / 1
333	5	OBCAID	1	active OBDH Id	-	0 / 1
333	6	TMTXRT	1	TX baudrate	4800 · value + 4800	bps
333	7	PCCH27	1	PCDU check channel 27	-	On / Off
334	0	analog value #16	12	Current charger #0 input	0,305176 · value	mA
335	4	PCCH28	1	PCDU check channel 28	-	On / Off
335	5	PCCH29	1	PCDU check channel 29	-	On / Off
335	6	PCCH30	1	PCDU check channel 30	-	On / Off
335	7	PCCH31	1	PCDU check channel 31	-	On / Off
336	0	CCTICC	8	immediate command counter	value	1
337	0	CCTCTT	8	time tagged command counter	value	1
338	0	CCETCS	8	command checksum error counter	value	1
339	0	CCEIMC	8	immediate command error counter	value	1
340	0	CCETTC	8	time tagged command error counter	value	1
341	0	CCETTG	8	time tag error counter	value	1
342	0	CCETCC	8	command code error counter	value	1
343	0	TCRXQU	8	receiving TNC quality byte	0,054878 · value + 1,573172	dB
344	0	TCFRCP	16	free command pool	value	1
346	0	TMHKUR	16	housekeeping update rate	value	seconds
348	0	CSTUTC	32	on board time in utc	value	seconds
352	0	CSTSYS	32	obc uptime	value	seconds

356	0	OBCBAD	8	boot address	-	0 / 1 / 2 / 3
357	0	CESWMC	8	error counter for missing magic code	value	1
358	0	reserved	8			
359	0	BEACON	8	beacon mode	-	On / Off
360	0	OBCABC	8	active OBDH boot counter	value	1
361	0	MODOBC	8	Satellite mode	value	1
362	0	CCECAN	8	CAN error counter	value	
363	0	OBCCAN	8	selected CAN bus at active OBDH	-	0 / 1
364	0	PCSYST	16	PCDU uptime	value	seconds
366	0	PCBCNT	8	PCDU boot counter	value	1
367	0	PCTXEC	8	PCDU CAN transmitt error counter	value	1
368	0	PCRXEC	8	PCDU CAN receive error counter	value	1
369	0	PCOFFC	8	PCDU CAN offline error counter	value	1
370	0	PCACKC	8	PCDU CAN acknowledge error counter	value	1
371	0	PCCH32	1	PCDU check channel 32	-	On / Off
371	1	PCCH33	1	PCDU check channel 33	-	On / Off
371	2	PCCH34	1	PCDU check channel 34	-	On / Off
371	3	PCCH35	1	PCDU check channel 35	-	On / Off
371	4	PCCH36	1	PCDU check channel 36	-	On / Off
371	5	PCCH37	1	PCDU check channel 37	-	On / Off
371	6	PCCH38	1	PCDU check channel 38	-	On / Off
371	7	PCCH39	1	PCDU check channel 39	-	On / Off
372	0	PCCH40	1	PCDU check channel 40	-	On / Off
372	1	PCCH41	1	PCDU check channel 41	-	On / Off
372	2..7	reserved	14			
374	0	analog value #17	12	Current charger #1 input	0,305176 · value	mA
375	4	reserved	4			
376	0	analog value #18	12	Temperature PCDU ext. ADC #0	0,125 · value	°C
377	4	reserved	4			
378	0	analog value #19	12	Temperature MFS0	0,061035 · value - 50	°C
379	4..7	reserved	4			
380	0	ACSWHX	16	wheel speed X	value	rpm
382	0	ACSWHY	16	wheel speed Y	value	rpm
384	0	ACSWHZ	16	wheel speed Z	value	rpm
386	0	ACSQ00	16	ACS quaternion 00	0,0001 · value	1
388	0	ACSQ01	16	ACS quaternion 01	0,0001 · value	1

390	0	ACSQ02	16	ACS quaternion 02	0,0001 · value	1
392	0	ACSQ03	16	ACS quaternion 03	0,0001 · value	1
394	0	ACSSUX	16	ACS sun vector X	0,0001 · value	1
396	0	ACSSUY	16	ACS sun vector Y	0,0001 · value	1
398	0	ACSSUZ	16	ACS sun vector Z	0,0001 · value	1
400	0	ACSM0X	16	ACS magnetic field sensor 0 vector X	10 · value	nT
402	0	ACSM0Y	16	ACS magnetic field sensor 0 vector Y	10 · value	nT
404	0	ACSM0Z	16	ACS magnetic field sensor 0 vector Z	10 · value	nT
406	0	ACSM1X	16	ACS magnetic field sensor 1 vector X	10 · value	nT
408	0	ACSM1Y	16	ACS magnetic field sensor 1 vector Y	10 · value	nT
410	0	ACSM1Z	16	ACS magnetic field sensor 1 vector Z	10 · value	nT
412	0	ACSMOD	4	ACS mode	value	1
412	4	ACSGSC	1	ground station contact	-	0 / 1
412	5	ACSSHD	1	shadow flag	-	0 / 1
412	6..7	reserved	2			
413	0	ACSERR	8	ACS Error Code	value	1
414	0	ACSGYX	16	Gyro rate Z	0,0573 · value + 19,7097	deg/s
416	0	ACSGYY	16	Gyro rate Y	-0,0573 · value + 21,9443	deg/s
418	0	ACSGYZ	16	Gyro rate Z	-0,0573 · value + 2,5210	deg/s
420	0	analog value #20	12	Temperature OBC ext. ADC #0	0,125 · value	°C
421	4	reserved	4			
422	0	analog value #21	12	Current solar array x+	0,152588 · value	mA
423	4..7	reserved	4			
424	0	analog value #22	12	Current solar array y+	0,152588 · value	mA
425	4..7	reserved	4			
426	0	analog value #23	12	Current solar array z+	0,152588 · value	mA
427	4..7	reserved	4			
428	0	analog value #24	12	Temperature Gyro rate X	0,48577 · value - 270,595	°C
429	4..7	reserved	4			
430	0	FECF	16	frame error control field (CCSDS)	-	-
432	0	ASM (attached synchronisation marker)	32	0x1ACFFC1D		
436	0	TFVN (transfer frame version number)	2	0		
436	2	SCID (spacecraft Identifier)	10	0xBE		
437	4	VCID (virtual channel Identifier)	3	0x0..0x7		
437	7	OCFF (operational control field flag)	1	0		
438	0	MCFC (master channel frame count)	8	0..255		

439	0	VCFC (virtual channel frame count)	8	0..255		
440	0	TF_SHF (TF secondary header flag)	1	0		
440	1	synchronisation flag	1	0		
440	2	POF (packet order flag)	1	0		
440	3	SLID (segment length identifier)	2	0x3		
440	5	FHP (first header pointer)	11	0x0		
442	0	PVN (packet version number)	3	0x0		
442	3	PT (packet type)	1	0		
442	4	SHF (secondary header flag)	1	0		
442	5	APID (application process identifier)	11	0x0..0x7FF		
444	0	sequence flag	2	0x0..0x3		
444	2	PSC (packet sequence control)	14	0x0..0x3FFF		
446	0	PDL (packet data length)	16	0x007F		
448	0	analog value #1	12	Voltage solar array	0,001620 · value	V
449	4	PSANT0	1	Power state antenna release mechanism #0	-	On / Off
449	5	PSANT1	1	Power state antenna release mechanism #1	-	On / Off
449	6	PSCOM0	1	inactive!		
449	7	PSCOM1	1	inactive!		
450	0	analog value #2	12	Voltage battery #0	0,003373 · value	V
451	4	PSUHF0	1	Power state TRX #0	-	On / Off
451	5	PSUHF1	1	Power state TRX #1	-	On / Off
451	6	PSTNC0	1	Power state TNC #0	-	On / Off
451	7	PSTNC1	1	Power state TNC #1	-	On / Off
452	0	analog value #3	12	Voltage battery #1	0,003373 · value	V
453	4	PSGYRO	1	Power state gyro System	-	On / Off
453	5	PSMCSX	1	Power state magnetic coil system x	-	On / Off
453	6	PSMCSY	1	Power state magnetic coil system y	-	On / Off
453	7	PSMCSZ	1	Power state magnetic coil system z	-	On / Off
454	0	analog value #4	12	Voltage bus 5V	0,001620 · value	V
455	4	PSWHEE	1	Power state wheel system	-	On / Off
455	5	PSOBC0	1	Power state OBC0	-	On / Off
455	6	PSOBC1	1	Power state OBC1	-	On / Off
455	7	PSPDH0	1	Power state PHD	-	On / Off
456	0	analog value #5	12	Voltage bus 3.3V	0,001221 · value	V
457	4	PSCAM0	1	Power state payload camera	-	On / Off
457	5	PSSUNS	1	Power state sun sensor system	-	On / Off

457	6	PSMFS0	1	Power state magnetic field sensor system #0	-	On / Off
457	7	PSMFS1	1	Power state magnetic field sensor system #1	-	On / Off
458	0	analog value #6	12	Current charger #0 output	0,610352 · value	mA
459	4	PSTEMP	1	Power state temperature sensors	-	On / Off
459	5	PSCAN0	1	Power state CAN bus #0	-	On / Off
459	6	PSCAN1	1	Power state CAN bus #1	-	On / Off
459	7	PSCCW0	1	Power state WDE can controller #0	-	On / Off
460	0	analog value #7	12	Current charger #1 output	0,610352 · value	mA
461	4	PSCCW1	1	Power state WDE can controller #1	-	On / Off
461	5	PS5VCN	1	Power state 5V main switch	-	On / Off
461	6	PCUAID	1	active PCDU Id		
461	7	PCBOBC	1	startup OBDH Id	-	0 / 1
462	0	analog value #8	12	Temperature battery #0	0,244141 · value - 50	°C
463	4	PCBEXT	1	boot external flash	-	0 / 1
463	5	PCCH00	1	PCDU check channel 00	-	On / Off
463	6	PCCH01	1	PCDU check channel 01	-	On / Off
463	7	PCCH02	1	PCDU check channel 02	-	On / Off
464	0	analog value #9	12	Temperature battery #1	0,244141 · value - 50	°C
465	4	PCCH03	1	PCDU check channel 03	-	On / Off
465	5	PCCH04	1	PCDU check channel 04	-	On / Off
465	6	PCCH05	1	PCDU check channel 05	-	On / Off
465	7	PCCH06	1	PCDU check channel 06	-	On / Off
466	0	analog value #10	12	signal strength TNC #0	1	S-meter
467	4	PCCH07	1	PCDU check channel 07	-	On / Off
467	5	PCCH08	1	PCDU check channel 08	-	On / Off
467	6	PCCH09	1	PCDU check channel 09	-	On / Off
467	7	PCCH10	1	PCDU check channel 10	-	On / Off
468	0	analog value #11	12	signal strength TNC #1	1	S-meter
469	4	PCCH11	1	PCDU check channel 11	-	On / Off
469	5	PCCH12	1	PCDU check channel 12	-	On / Off
469	6	PCCH13	1	PCDU check channel 13	-	On / Off
469	7	PCCH14	1	PCDU check channel 14	-	On / Off
470	0	analog value #12	12	Current wheel drive electronics	0,305176 · value	mA
471	4	PCCH15	1	PCDU check channel 15	-	On / Off
471	5	PCCH16	1	PCDU check channel 16	-	On / Off
471	6	PCCH17	1	PCDU check channel 17	-	On / Off

471	7	PCCH18	1	PCDU check channel 18	-	On / Off
472	0	analog value #13	12	Temperature wheel X	0,061035 · value - 50	°C
473	4	PCCH19	1	PCDU check channel 19	-	On / Off
473	5	PCCH20	1	PCDU check channel 20	-	On / Off
473	6	PCCH21	1	PCDU check channel 21	-	On / Off
473	7	PCCH22	1	PCDU check channel 22	-	On / Off
474	0	analog value #14	12	Temperature wheel Y	0,061035 · value - 50	°C
475	4	PCCH23	1	PCDU check channel 23	-	On / Off
475	5	PCCH24	1	PCDU check channel 24	-	On / Off
475	6	PCCH25	1	PCDU check channel 25	-	On / Off
475	7	PCCH26	1	PCDU check channel 26	-	On / Off
476	0	analog value #15	12	Temperature wheel Z	0,061035 · value - 50	°C
477	4	TCRXID	1	receiving TNC Id	-	0 / 1
477	5	OBCAID	1	active OBDH Id	-	0 / 1
477	6	TMTXRT	1	TX baudrate	4800 · value + 4800	bps
477	7	PCCH27	1	PCDU check channel 27	-	On / Off
478	0	analog value #16	12	Current charger #0 input	0,305176 · value	mA
479	4	PCCH28	1	PCDU check channel 28	-	On / Off
479	5	PCCH29	1	PCDU check channel 29	-	On / Off
479	6	PCCH30	1	PCDU check channel 30	-	On / Off
479	7	PCCH31	1	PCDU check channel 31	-	On / Off
480	0	CCTICC	8	immediate command counter	value	1
481	0	CCTCTT	8	time tagged command counter	value	1
482	0	CCETCS	8	command checksum error counter	value	1
483	0	CCEIMC	8	immediate command error counter	value	1
484	0	CCETTC	8	time tagged command error counter	value	1
485	0	CCETTG	8	time tag error counter	value	1
486	0	CCETCC	8	command code error counter	value	1
487	0	TCRXQU	8	receiving TNC quality byte	0,054878 · value + 1,573172	dB
488	0	TCFRCP	16	free command pool	value	1
490	0	TMHKUR	16	housekeeping update rate	value	seconds
492	0	CSTUTC	32	on board time in utc	value	seconds
496	0	CSTSYS	32	obc uptime	value	seconds
500	0	OBCBAD	8	boot address	-	0 / 1 / 2 / 3
501	0	CESWMC	8	error counter for missing magic code	value	1
502	0	reserved	8			

503	0	BEACON	8	beacon mode	-	On / Off
504	0	OBCABC	8	active OBDH boot counter	value	1
505	0	MODOBC	8	Satellite mode	value	1
506	0	CCECAN	8	CAN error counter	value	
507	0	OBCCAN	8	selected CAN bus at active OBDH	-	0 / 1
508	0	PCSYST	16	PCDU uptime	value	seconds
510	0	PCBCNT	8	PCDU boot counter	value	1
511	0	PCTXEC	8	PCDU CAN transmitt error counter	value	1
512	0	PCRXEC	8	PCDU CAN receive error counter	value	1
513	0	PCOFFC	8	PCDU CAN offline error counter	value	1
514	0	PCACKC	8	PCDU CAN acknowledge error counter	value	1
515	0	PCCH32	1	PCDU check channel 32	-	On / Off
515	1	PCCH33	1	PCDU check channel 33	-	On / Off
515	2	PCCH34	1	PCDU check channel 34	-	On / Off
515	3	PCCH35	1	PCDU check channel 35	-	On / Off
515	4	PCCH36	1	PCDU check channel 36	-	On / Off
515	5	PCCH37	1	PCDU check channel 37	-	On / Off
515	6	PCCH38	1	PCDU check channel 38	-	On / Off
515	7	PCCH39	1	PCDU check channel 39	-	On / Off
516	0	PCCH40	1	PCDU check channel 40	-	On / Off
516	1	PCCH41	1	PCDU check channel 41	-	On / Off
516	2..7	reserved	14			
518	0	analog value #17	12	Current charger #1 input	0,305176 · value	mA
519	4	reserved	4			
520	0	analog value #18	12	Temperature PCDU ext. ADC #0	0,125 · value	°C
521	4	reserved	4			
522	0	analog value #19	12	Temperature MFS0	0,061035 · value - 50	°C
523	4..7	reserved	4			
524	0	ACSWHX	16	wheel speed X	value	rpm
526	0	ACSWHY	16	wheel speed Y	value	rpm
528	0	ACSWHZ	16	wheel speed Z	value	rpm
530	0	ACSQ00	16	ACS quaternion 00	0,0001 · value	1
532	0	ACSQ01	16	ACS quaternion 01	0,0001 · value	1
534	0	ACSQ02	16	ACS quaternion 02	0,0001 · value	1
536	0	ACSQ03	16	ACS quaternion 03	0,0001 · value	1
538	0	ACSSUX	16	ACS sun vector X	0,0001 · value	1

540	0	ACSSUY	16	ACS sun vector Y	0,0001 · value	1
542	0	ACSSUZ	16	ACS sun vector Z	0,0001 · value	1
544	0	ACSM0X	16	ACS magnetic field sensor 0 vector X	10 · value	nT
546	0	ACSM0Y	16	ACS magnetic field sensor 0 vector Y	10 · value	nT
548	0	ACSM0Z	16	ACS magnetic field sensor 0 vector Z	10 · value	nT
550	0	ACSM1X	16	ACS magnetic field sensor 1 vector X	10 · value	nT
552	0	ACSM1Y	16	ACS magnetic field sensor 1 vector Y	10 · value	nT
554	0	ACSM1Z	16	ACS magnetic field sensor 1 vector Z	10 · value	nT
556	0	ACSMOD	4	ACS mode	value	1
556	4	ACSGSC	1	ground station contact	-	0 / 1
556	5	ACSSHD	1	shadow flag	-	0 / 1
556	6..7	reserved	2			
557	0	ACSERR	8	ACS Error Code	value	1
558	0	ACSGYX	16	Gyro rate X	0,0573 · value + 19,7097	deg/s
560	0	ACSGYY	16	Gyro rate Y	-0,0573 · value + 21,9443	deg/s
562	0	ACSGYZ	16	Gyro rate Z	-0,0573 · value + 2,5210	deg/s
564	0	analog value #20	12	Temperature OBC ext. ADC #0	0,125 · value	°C
565	4	reserved	4			
566	0	analog value #21	12	Current solar array x+	0,152588 · value	mA
567	4..7	reserved	4			
568	0	analog value #22	12	Current solar array y+	0,152588 · value	mA
569	4..7	reserved	4			
570	0	analog value #23	12	Current solar array z+	0,152588 · value	mA
571	4..7	reserved	4			
572	0	analog value #24	12	Temperature Gyro rate X	0,48577 · value - 270,595	°C
573	4..7	reserved	4			
574	0	FECF	16	frame error control field (CCSDS)	-	-