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Revision: 1.0.0 Date: 11/30/2018

Telemetry Handbook

For the HuskySat-1 Mission



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Telemetry Packets

AMSAT BDOT_TUMBLE_STATUS

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	0	0	DERIVED		%0.6f	
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count			0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	0	16	UINT			
FIXED_TYPE	Fixed message type f Id Value: 128	16	16	UINT			
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the t	N message, in microseconds. This is the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	N message, in microseconds. This is the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fi	rom the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	176	16	UINT			
CANID_PADDING	Fixed value of 0 - res	192	1	UINT			
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	e message is a standard or extended frame	. 194	1	UINT		
CANID_ID	The ID (normal or ex headers.	tended) portion of the 'CAN ID' set of	195	29	UINT		



PADDING

Date: 11/30/2018

	Id Value: 308740128					
	State EXTENDED STANDARD		Value			
			1			
			0			
BDOT_TUMBLE_STATUS_STATUS	bdot tumble status boolean			224	1	UINT
	State	Value				
	FALSE	0				

225

63

UINT

AMSAT CMD_MTQ_BDOT

Padded bits for CAN data

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	SECONDS COSMOS Packet Time (UTC, Floating point, Unix epoch)				0	DERIVED		%0.6f
	Read Conversion:	Р	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch)				0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string)				0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed co	punt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	N me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128				16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				32	UINT		



CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 8 UINT 160 hardware/software. DLC Date Length Count from the CAN message. 168 8 **UINT FLAGS UINT** NOT USED in current PCAN-Ethernet Gateway DR 176 16 hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 **UINT** CANID_TYPE **UINT** Indicates whether the message is a standard or extended frame. 194 1 CANID_ID 29 UINT The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 Id Value: 307691553 **State** Value **EXTENDED** 0 STANDARD CMD_MTQ_BDOT_X bdot command for x direction 224 8 INT CMD_MTQ_BDOT_Y bdot command for y direction 232 8 INT CMD_MTQ_BDOT_Z bdot command for z direction 240 8 INT

248

40

UINT

AMSAT CMD_MTQ_FSW

Padded bits for CAN data

PADDING

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pa	ncketTimeSecondsConversion					
PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string)		0	0	DERIVED				
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f	
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	TED COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED			
	Read Conversion: ReceivedTimeFormattedConversion							
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED			
	Read Conversion: ReceivedCountConversion							
LENGTH	Length of TCP-ized CA	Length of TCP-ized CAN message (always 36/0x24 bytes)				UINT		
			3 (, , , , , , , , , , , , , , , , , ,					



FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	16	UINT
TAG	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR		32	64	UINT
TIMESTAMP_L	Timestamp of the CAN message, in micros bytes of the timestamp.	econds. Th	is is the lower 4	96	32	UINT
TIMESTAMP_H	Timestamp of the CAN message, in micros 4 bytes of the timestamp.	econds. Th	is is the upper	128	32	UINT
CHANNEL	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR		160	8	UINT
DLC	Date Length Count from the CAN message	e.		168	8	UINT
FLAGS	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR		176	16	UINT
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether the message is a standa	rd or exter	nded frame.	194	1	UINT
CANID_ID	The ID (normal or extended) portion of the Id Value: 302252067	e 'CAN ID'	set of headers.	195	29	UINT
	State	Value				
	EXTENDED	1				
	STANDARD	0				
CMD_MTQ_FSW_X	bdot command for x direction			224	8	INT
CMD_MTQ_FSW_Y	bdot command for y direction			232	8	INT
CMD_MTQ_FSW_Z	bdot command for z direction			240	8	INT
CMD_MTQ_FSW_SC_MODE	overall satellite state			248	8	UINT
	State		Value			
	TUMBLING		0			
	NOT_TUMBLING_ALICE					
	NOT_TUMBLING_BOB		2			
	NOT_TUMBLING_CHARLIE		3			
PADDING	Padded bits for CAN data			256	32	UINT

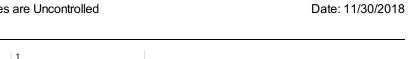
AMSAT CMD_REBOOT_REQUEST

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					



PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string)						0	DERIVED	
	Read Conversion: PacketTimeFormattedConversion							
RECEIVED_TIMESECONDS	COSMOS Received Ti	ime (UTC, Flo	ating p	0	0	DERIVED	%0.6f	
	Read Conversion:	ReceivedTi	imeSe	condsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	ime (Local tim	ne zon	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTir	meFor	mattedConversion				
RECEIVED_COUNT	COSMOS packet rece	eived count			0	0	DERIVED	
	Read Conversion:	Receive	edCou	ntConversion				
1510511	(==== 1.0			26/2 241				
LENGTH	Length of TCP-ized C	AN message	(alway	's 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN			16	16	UINT	
TAG	NOT USED in current hardware/software.	: PCAN-Etherr	net Ga	iteway DR	32	64	UINT	
	<u> </u>							
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the t		n micro	oseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	n micro	128	32	UINT			
	upper 1 by tes of the	carrescarrip.						
CHANNEL	NOT USED in current hardware/software.	: PCAN-Etherr	net Ga	iteway DR	160	8	UINT	
DLC	Date Length Count fi	rom the CAN	messa	age.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Etherr	net Ga	iteway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the frame.	e message is a	a stan	dard or extended	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 262152				195	29	UINT	
	State			Value				
	EXTENDED							
	STANDARD			0				
				-				
CMD_REBOOT_REQUEST_DOMAIN	domain to reboot				224	8	UINT	
	State		Valu	Δ			OT 41	
	PPT		0					





EPS	1
WHEEL	2
ESTIM	3
BDOT	4
RAHS	5
COM2	6
COM1	7
UNK	8

PADDING	Padded bits for CAN data	232	56	UINT

AMSAT COM2_STATE

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the uppe 4 bytes of the timestamp.	r 128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		



DLC	Date Length Count from the CAN messag	Date Length Count from the CAN message.					
FLAGS	NOT USED in current PCAN-Ethernet Gat hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.					
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT			
CANID_RTR	RTR value.	193	1	UINT			
CANID_TYPE	Indicates whether the message is a stand	194	1	UINT			
CANID_ID	The ID (normal or extended) portion of the headers. Id Value: 307757552						
	State	Value					
	EXTENDED	1					
	STANDARD	0					
COM2_STATE_UPTIME	time since least mcu reboot		224	16	UINT	S	%0.4f
COM2_STATE_QLEN	length of the queue of py files to run		240	16	UINT		
COM2_STATE_QFILESIZE	size of most recent queue file	256	16	UINT			
COM2_STATE_CURR_FILE	which fille is comm2 running rn	ich fille is comm2 running rn					
COM2_STATE_HEALTH_STATE	health state codes		280	8	UINT		

AMSAT EPS_DIST_AUTOSEQ_GET_IND_RSP

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					



0 **LENGTH** Length of TCP-ized CAN message (always 36/0x24 16 **UINT** bytes) Fixed message type for CAN 16 16 **UINT** FIXED_TYPE Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 UINT hardware/software. **UINT** TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is 96 32 the lower 4 bytes of the timestamp. UINT TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is 128 32 the upper 4 bytes of the timestamp. CHANNEL 160 8 UINT NOT USED in current PCAN-Ethernet Gateway DR hardware/software. DLC 8 Date Length Count from the CAN message. 168 **UINT FLAGS** 176 16 UINT NOT USED in current PCAN-Ethernet Gateway DR hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 UINT CANID_RTR RTR value. 193 1 **UINT** CANID_TYPE Indicates whether the message is a standard or extended 194 1 **UINT** frame. CANID_ID The ID (normal or extended) portion of the 'CAN ID' set 195 29 UINT of headers. Id Value: 307233496 State Value **EXTENDED** 0 **STANDARD**

AMSAT EPS_DIST_AUTOSEQ_GET_MET_RSP

EPS_DIST_AUTOSEQ_GET_IND_RSP_IND the indices, as an 8-element array

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	COSMOS Packet Time (UTC, Floating point, Unix epoch) Read Conversion: PacketTimeSecondsConversion		0	DERIVED		%0.6f
	Read Conversion:						
PACKET_TIMEFORMATTED	COSMOS Packet Tim string)	e (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T epoch)	COSMOS Received Time (UTC, Floating point, Unix poch)		0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					

224

64

UINT

0 RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted 0 **DERIVED** string) Read ReceivedTimeFormattedConversion Conversion: RECEIVED_COUNT COSMOS packet received count **DERIVED** Read Conversion: ReceivedCountConversion Length of TCP-ized CAN message (always 36/0x24 **LENGTH** n 16 **UINT** FIXED_TYPE 16 16 UINT Fixed message type for CAN Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 **UINT** hardware/software. 32 **UINT** TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is 96 the lower 4 bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is 128 32 UINT the upper 4 bytes of the timestamp. **CHANNEL** NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC 168 8 UINT Date Length Count from the CAN message. **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 UINT hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 **UINT** RTR value. **UINT** CANID_RTR 193 1 CANID_TYPE Indicates whether the message is a standard or 194 1 UINT extended frame. CANID_ID The ID (normal or extended) portion of the 'CAN ID' set 195 29 UINT of headers. Id Value: 307233497 Value State **EXTENDED** 1 **STANDARD** 0 the MET 224 32 UINT EPS_DIST_AUTOSEQ_GET_MET_RSP_MET S Read Conversion: value * 2.0**-15 **PADDING** Padded bits for CAN data 256 32 UINT

AMSAT ESTIM_MAG_UNIT_X



Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)			0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Fo	ormatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating po	int, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone,	Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFor						
RECEIVED_COUNT	COSMOS packet receiv	ved count	0	0	DERIVED			
	Read Conversion:	ReceivedCou	IntConversion					
LENGTH	Length of TCP-ized CA	NN message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		seconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messag	e.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a standa	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 302449333					UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					



ESTIM_MAG_UNIT_X_VAL Unit vector of direction of magnetic field z 224 64 FLOAT %0.4f

AMSAT ESTIM_MAG_UNIT_Y

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	I time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved co	punt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		age, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		age, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om the	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	messa	age is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or ext Id Value: 30244933) portion of the 'CAN ID' set of headers.	195	29	UINT		



AMSAT ESTIM_MAG_UNIT_Z

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pa	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	l time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved co	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN mes	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		age, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		age, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om the	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-	Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		



Indicates whether the message is a standard or extended frame. UINT CANID_TYPE 194 1 29 CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 UINT Id Value: 302449335 **State** Value **EXTENDED** 1 0 STANDARD ESTIM_MAG_UNIT_Z_VAL Unit vector of direction of magnetic field \boldsymbol{x} 224 FLOAT %0.4f

AMSAT ESTIM_STATE

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pa	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	I time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	ne (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved co	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current I hardware/software.	PCAN-	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		age, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestal		age, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current I hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				UINT		
DLC	Date Length Count fro	om the	e CAN message.	168	8	UINT		



FLAGS	NOT USED in current PCAN-Ether hardware/software.	net Gate	way DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether the message is	a standa	rd or extended frame.	194	1	UINT
CANID_ID	The ID (normal or extended) port Id Value: 302449336	ion of th	195	29	UINT	
	State		Value			
	EXTENDED		1			
	STANDARD		0			
ESTIM_STATE_ABOVE_GS	Are we above the ground stn?			224	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1				
ESTIM_STATE_IN_SUN	Are we in the sun?			225	1	UINT
	State	Value				
	FALSE 0					
	TRUE	1				
PADDING	Padded bits for CAN data			226	62	UINT

AMSAT ESTIM_SUN_UNIT_X

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					



RECEIVED_COUNT	COSMOS packet received	count		0	0	DERIVED	
	Read Conversion:	ReceivedCou					
LENGTH	Length of TCP-ized CAN n	nessage (always	36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for C. Id Value: 128	Fixed message type for CAN Id Value: 128					
TAG	NOT USED in current PCA hardware/software.	32	64	UINT			
TIMESTAMP_L	Timestamp of the CAN me bytes of the timestamp.	essage, in micros	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN me 4 bytes of the timestamp		seconds. This is the upper	128	32	UINT	
CHANNEL	NOT USED in current PCA hardware/software.	AN-Ethernet Gate	160	8	UINT		
DLC	Date Length Count from	the CAN messag	e.	168	8	UINT	
FLAGS	NOT USED in current PCA hardware/software.	AN-Ethernet Gate	eway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserve	d.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the me	ssage is a standa	ard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extend Id Value: 302449330	ed) portion of th	e 'CAN ID' set of headers.	195	29	UINT	
	State	State Value					
	EXTENDED	EXTENDED 1					
	STANDARD 0						
ESTIM_SUN_UNIT_X_VAL	Unit vector of where the	224	64	FLOAT	%0.4f		

AMSAT ESTIM_SUN_UNIT_Y

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (SMOS Packet Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					



RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Loc	al time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	Rece	eivedTimeForn	nattedConversion				
RECEIVED_COUNT	COSMOS packet rece	eived cou	unt		0	0	DERIVED	
	Read Conversion:		ReceivedCou	ntConversion				
LENGTH	Length of TCP-ized C	AN mes	sage (always 3	36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	ixed message type for CAN d Value: 128				16	UINT	
TAG	NOT USED in current hardware/software.	OT USED in current PCAN-Ethernet Gateway DR ardware/software.					UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 yets of the timestamp.				32	UINT	
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-E	Ethernet Gate	way DR	160	8	UINT	
DLC	Date Length Count fr	rom the	CAN message	2.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-E	Ethernet Gate	way DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	e messa	ge is a standaı	d or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext Id Value: 3024493		portion of the	e 'CAN ID' set of headers.	195	29	UINT	
	State			Value				
	EXTENDED			1				
	STANDARD 0							
ESTIM_SUN_UNIT_Y_VAL	AL Unit vector of where the sun is at y				224	64	FLOAT	%0.4f

AMSAT ESTIM_SUN_UNIT_Z

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (U	OSMOS Packet Time (UTC, Floating point, Unix epoch)			DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					



RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating po	int, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFor	mattedConversion				
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED	
	Read Conversion:	ReceivedCou	ntConversion				
LENGTH	Length of TCP-ized CA	Length of TCP-ized CAN message (always 36/0x24 bytes)					
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.					
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.					
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		econds. This is the upper	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gate	way DR	160	8	UINT	
DLC	Date Length Count fro	om the CAN messag	e.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gate	way DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a standa	rd or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext Id Value: 30244933	, .	e 'CAN ID' set of headers.	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
ESTIM_SUN_UNIT_Z_VAL	Unit vector of where t			224	64	FLOAT	%0.4f

AMSAT GCMD_DIST_SET_PD_OVC_COM1

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					

PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zo	ne, Formatted string)	0	0	DERIVED	
	Read Conversion: PacketTimeFo	rmattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Float	ing point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion: ReceivedTime	SecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time string)	zone, Formatted	0	0	DERIVED	
	Read Conversion: ReceivedTimeF	FormattedConversion				
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED	
	Read Conversion: Received Co	ountConversion				
LENGTH	Length of TCP-ized CAN message (a	lways 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT	
TAG	NOT USED in current PCAN-Etherne hardware/software.	t Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in the lower 4 bytes of the timestamp.		96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in the upper 4 bytes of the timestamp		128	32	UINT	
CHANNEL	NOT USED in current PCAN-Etherne hardware/software.	t Gateway DR	160	8	UINT	
DLC	Date Length Count from the CAN m	iessage.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Etherne hardware/software.	t Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the message is a frame.	standard or extended	194	1	UINT	
CANID_ID	The ID (normal or extended) portion headers. Id Value: 302252734	n of the 'CAN ID' set of	195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				
GCMD_DIST_SET_PD_OVC_COM1_OVC	Set PD Overcurrent Com1		224	32	FLOAT	
PADDING	Padded bits for CAN data		256	32	UINT	



AMSAT GENERAL_CAN_MESSAGE

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point	, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSeco	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Fo	rmatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	attedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	DSMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	Read Conversion: ReceivedTimeSecondsConversion						
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	OSMOS Received Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:	ReceivedTimeForm	mattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ntConversion					
LENGTH	Length of TCP-ized CAI	N message (always :	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN		16	16	UINT		
TAG	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp		econds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestan		econds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	160	8	UINT		
DLC	Date Length Count fro	m the CAN message	2.	168	8	UINT		
FLAGS	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reser	Fixed value of 0 - reserved.			1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers.			195	29	UINT		
	State		Value					
	EXTENDED		1					



ntrolled Date: 11/30/2018

	STANDARD	0			
DATA	CAN data		224	64	UINT
DATA	CAN data		227	70	OIM

AMSAT MPC_VP

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	OSMOS Received Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	Read Conversion: Received Time Seconds Conversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type fo Id Value: 128	r CAN	16	16	UINT		
TAG	NOT USED in current I hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp	message, in microseconds. This is the lower 4 p.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestal	message, in microseconds. This is the upper mp.	128	32	UINT		
CHANNEL	NOT USED in current I hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		176	16	UINT		
CANID_PADDING	Fixed value of 0 - reser	Fixed value of 0 - reserved.		1	UINT		
CANID_RTR	RTR value.	RTR value.		1	UINT		
CANID_TYPE	Indicates whether the	Indicates whether the message is a standard or extended frame.			UINT		



CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT Id Value: 302448674 **State** Value EXTENDED 1 STANDARD 0 MPC_VP_STATUS None 224 UINT State Value 0 **FALSE** TRUE 1 **PADDING** Padded bits for CAN data 225 63 UINT

AMSAT MTQ_ACK

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	OSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed c	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type fo Id Value: 128	r CAN	N	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestal		sage, in microseconds. This is the upper	128	32	UINT		



CHANNEL	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR		160	8	UINT	
DLC	Date Length Count from the CAN messag	Date Length Count from the CAN message.					
FLAGS	NOT USED in current PCAN-Ethernet Gate hardware/software.		176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the message is a standa	ard or ext	ended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the Id Value: 307691568	195	29	UINT			
	State	Value					
	EXTENDED	1					
	STANDARD	0					
MTQ_ACK_PHASE	specifies what state the coils are in - meas phase	urement o	or actuation	224	8	INT	
	State		Value				
	MEASUREMENT_PHASE		0				
	ACTUATION_PHASE		1				
	PMS_PHASE		2				
MTQ_ACK_SOURCE	who the mtq last listened to - bdot or fsw			232	8	INT	
MTQ_ACK_LAST_BDOT_X	last bdot x command received			240	8	INT	
MTQ_ACK_LAST_BDOT_Y	last bdot y command received			248	8	INT	
MTQ_ACK_LAST_BDOT_Z	last bdot z command received				8	INT	
MTQ_ACK_LAST_FSW_X	last fsw x command received		264	8	INT		
MTQ_ACK_LAST_FSW_Y	last fsw y command received			272	8	INT	
MTQ_ACK_LAST_FSW_Z	last fsw z command received			280	8	INT	

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Forma
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Flo	ating point, Unix epoch) 0	0	DERIVED		%0.6f
	Read Conversion: PacketTin	neSecondsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time	ne zone, Formatted string) 0	0	DERIVED		
	Read Conversion: PacketTim	eFormattedConversion				

RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, epoch)	Floating point, Unix	0	0	DERIVED	%0.6f
	Read Conversion: ReceivedT	imeSecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local string)	time zone, Formatted	0	0	DERIVED	
	Read Conversion: ReceivedTi	meFormattedConversion				
RECEIVED_COUNT	COSMOS packet received count	t	0	0	DERIVED	
	Read Conversion: Receive	edCountConversion				
LENGTH	Length of TCP-ized CAN message bytes)	ength of TCP-ized CAN message (always 36/0x24 ytes)				
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT	
TAG	NOT USED in current PCAN-Eth hardware/software.	ernet Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN message the lower 4 bytes of the timesta		96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN message the upper 4 bytes of the timest		128	32	UINT	
CHANNEL	NOT USED in current PCAN-Eth hardware/software.	ernet Gateway DR	160	8	UINT	
DLC	Date Length Count from the CA	AN message.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Eth hardware/software.	ernet Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the message frame.	is a standard or extended	194	1	UINT	
CANID_ID	The ID (normal or extended) poor headers. Id Value: 307823110	ortion of the 'CAN ID' set	195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_BDOT_1_SPAM_ON_X_MTQ_X	the averages of one axis of mag during one axis of the last spam		224	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_1_SPAM_ON_X_MTQ_Y	the averages of one axis of mag during one axis of the last span		240	16	INT	nT



Read Conversion: value * 73.0 RC_ADCS_BDOT_1_SPAM_ON_X_MTQ_Z the averages of one axis of magnetometer readings 256 16 INT nΤ during one axis of the last spam Read Conversion: value * 73.0 272 RC_ADCS_BDOT_1_SPAM_ON_Y_MTQ_X the averages of one axis of magnetometer readings 16 INT nΤ during one axis of the last spam value * 73.0 Read Conversion:

Item Name	Description	Bit Offs		Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating poin	t, Unix epoch) 0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecon	dsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Fo	ormatted string) 0	0	DERIVED		
	Read Conversion: PacketTimeFormat	tedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating po	oint, Unix epoch) 0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSeco	ndsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone,	Formatted string) 0	0	DERIVED		
Read Conversion: ReceivedTimeFormattedConversion		attedConversion				
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCount	Conversion				
LENGTH	Length of TCP-ized CAN message (always	36/0x24 bytes) 0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR 32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in micros lower 4 bytes of the timestamp.	seconds. This is the 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in micros upper 4 bytes of the timestamp.	seconds. This is the 128	3 32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gate hardware/software.	eway DR 160	8	UINT		



DLC	Date Length Count from the CAN me	essage.	168	8	UINT
FLAGS	NOT USED in current PCAN-Ethernet hardware/software.	Gateway DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT
CANID_RTR	RTR value.	193	1	UINT	
CANID_TYPE	Indicates whether the message is a st frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion headers. Id Value: 308871901	of the 'CAN ID' set of	195	29	UINT
	State	Value			
	EXTENDED	1			
	STANDARD	0			
RC_ADCS_BDOT_10_DIPOLE_VAR_X	The variance of sent dipole command	ls	224	16	UINT
RC_ADCS_BDOT_10_DIPOLE_VAR_Y	The variance of sent dipole command	ls	240	16	UINT
RC_ADCS_BDOT_10_DIPOLE_VAR_Z	The variance of sent dipole command	İs	256	16	UINT
PADDING	Padded bits for CAN data		272	16	UINT

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UT	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion							
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
		PacketTimeFormattedConversion						
RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch)				0	0	DERIVED		%0.6f
	Read Conversion:	R	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	eceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ived	count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)			0	16	UINT		
FIXED_TYPE	Fixed message type for	Fixed message type for CAN			16	UINT		



	Id Value: 128					
TAG	NOT USED in current PCAN-Ethernet hardware/software.	Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in molwer 4 bytes of the timestamp.	icroseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in mupper 4 bytes of the timestamp.	icroseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			UINT	
DLC	Date Length Count from the CAN me	Date Length Count from the CAN message.			UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.	Fixed value of 0 - reserved.			UINT	
CANID_RTR	RTR value.			1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) portion headers. Id Value: 307823111	of the 'CAN ID' set of	195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_BDOT_2_MAG_X_MIN	X Minium reading in nT		224	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_2_MAG_X_MAX	X Maximum reading in nT		240	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_2_MAG_X_AVG	X Average reading in nT		256	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_2_MAG_Y_MIN	I Y Minium reading in nT		272	16	INT	nT
	Read Conversion:	value * 73.0				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					

PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone,		0	0	DERIVED	
	Read Conversion: PacketTimeForm	mattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion: ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zon	e, Formatted string)	0	0	DERIVED	
	Read Conversion: ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED	
	Read Conversion: ReceivedCo	untConversion				
LENGTH	Length of TCP-ized CAN message (alway	/s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	UINT	
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet Gahardware/software.	ateway DR	160	8	UINT	
DLC	Date Length Count from the CAN mess	age.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gahardware/software.	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the message is a stan	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of headers. Id Value: 307823129	the 'CAN ID' set of	195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_BDOT_3_MAG_Y_MAX	X Y Maximum reading in nT		224	16	INT	nT
	Read Conversion:	alue * 73.0				



atellite Lab						
RC_ADCS_BDOT_3_MAG_Y_AVG	Y Average reading in nT		240	16	INT	nT
	Read Conversion:	value * 73.0				
			256			
RC_ADCS_BDOT_3_MAG_Z_MIN	Z Minium reading in nT		256	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_3_MAG_Z_MAX	Z Maximum reading in nT		272	16	INT	nT
	Read Conversion:	value * 73.0				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
Read Conversion: ReceivedTimeFormattedConversion							
RECEIVED_COUNT	COSMOS packet rec	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized (bytes)	CAN message (always 36/0x24	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.		96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.		128	32	UINT		



CHANNEL	NOT USED in current PCAN- hardware/software.	Etherr	net Gateway DR	160	8	UINT	
DLC	Date Length Count from the	e CAN	message.	168	8	UINT	
FLAGS	NOT USED in current PCAN- hardware/software.	Etherr	net Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the messa frame.	Indicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) of headers. Id Value: 307823130) porti	ion of the 'CAN ID' set	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_BDOT_4_MAG_Z_AVG	RC_ADCS_BDOT_4_MAG_Z_AVG Z Average reading in nT			224	16	INT	nT
	Read Conversion:		value * 73.0				
RC_ADCS_BDOT_4_SPAM_ON_Y_MTQ_Y	the averages of one axis of magnetometer readings during one axis of the last spam			240	16	INT	nT
	Read Conversion:						
RC_ADCS_BDOT_4_SPAM_ON_Y_MTQ_Z	the averages of one axis of r during one axis of the last sp		etometer readings	256	16	INT	nT
	Read Conversion:		value * 73.0				
RC_ADCS_BDOT_4_TUMBLE	RC_ADCS_BDOT_4_TUMBLE Tumble Status				1	UINT	
	State Value						
	FALSE 0						
	TRUE	1					
PADDING	Padded bits for CAN data			273	15	UINT	

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					

PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)			0	DERIVED	
	Read Conversion: PacketTimeForma	attedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating epoch)	point, Unix	0	0	DERIVED	%0.6f
	Read Conversion: ReceivedTimeSec	condsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zo	ne, Formatted	0	0	DERIVED	
- 1	string)					
	Read Conversion: ReceivedTimeForm	nattedConversion				
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED	
	Read Conversion: ReceivedCoun	tConversion				
LENGTH	Length of TCP-ized CAN message (always bytes)	ys 36/0x24	0	16	UINT	
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	UINT	
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in mic the upper 4 bytes of the timestamp.	roseconds. This is	128	32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet Ghardware/software.	Sateway DR	160	8	UINT	
DLC	Date Length Count from the CAN mes	sage.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet G hardware/software.	Sateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the message is a star frame.	ndard or extended	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823196		195	29	UINT	
	State V	alue				
	EXTENDED 1					
	STANDARD 0					
RC_ADCS_BDOT_5_SPAM_ON_Z_MTQ_X	the averages of one axis of magnetom during one axis of the last spam	eter readings	224	16	INT	nT



Read Conversion: value * 73.0 the averages of one axis of magnetometer readings RC_ADCS_BDOT_5_SPAM_ON_Z_MTQ_Y 240 16 INT nΤ during one axis of the last spam value * 73.0 Read Conversion: RC_ADCS_BDOT_5_SPAM_ON_Z_MTQ_Z the averages of one axis of magnetometer readings 256 16 INT nΤ during one axis of the last spam value * 73.0 Read Conversion: UINT **PADDING** Padded bits for CAN data 272 16

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	DERIVED		
	Read ReceivedTimeFormattedConversion Conversion:					
DECEMEN COUNT	COCKOC LL L			DED7/50		
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		



TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			160	8	UINT	
DLC	Date Length Count from the CAN message.			168	8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823216			195	29	UINT	
	State	Va	lue				
	EXTENDED	1					
	STANDARD	0					
RC_ADCS_BDOT_6_SPAM_OFF_TIME	Current setting for the time in minutes of SPAM not being on			224	16	UINT	min
RC_ADCS_BDOT_6_SPAM_ON_TIME	Current setting for the time in minutes of SPAM being on			240	16	UINT	min
RC_ADCS_BDOT_6_SPAM_CONTROL	Current setting on whether or not spam is enabled			256	1	UINT	
	State	State Value					
	FALSE	0	0				
	TRUE	1	1				
RC_ADCS_BDOT_6_MAX_TUMBLE_TIME	Current max tumbling time that bdot can be in until it swtiches to SLEEP_MODE automatically			257	16	UINT	min
RC_ADCS_BDOT_6_CURRENT_STATE	State that bdot is in. Chooses mode that bdot is in: 0 = NORMAL_MODE , 1 = SLEEP_MODE, 2 = SPAM_MAG_SELF_TEST, 3 = SPAM			273	2	UINT	
	State		Value				
	NORMAL_MODE		0				
	SLEEP_MODE		1				
	SPAM_MAG_SELF_TEST 2 SPAM 3		2				
RC_ADCS_BDOT_6_POP_STATUS_X	Current status of whether or not POP is enable for specified axis			275	1	UINT	
	State Value						
	FALSE						
	TRUE	1					



RC_ADCS_BDOT_6_POP_STATUS_Y	Current status of wl specified axis	nether or not PC	P is enable for	276	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1				
RC_ADCS_BDOT_6_POP_STATUS_Z	Current status of wl	nether or not PC	P is enable for	277	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1				
RC_ADCS_BDOT_6_GAIN_OVR_STATUS_	_X None			278	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1				
RC_ADCS_BDOT_6_GAIN_OVR_STATUS_	_Y None			279	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1	1			
RC_ADCS_BDOT_6_GAIN_OVR_STATUS_	_Z None			280	1	UINT
	State	Value				
	FALSE	0				
	TRUE	1				
RC_ADCS_BDOT_6_MAG_CONTROL	Shows the current state of magnetometer control on bdot. Choose the best fit magnetometer from ground. 0 = Auto, 1 = MAG_BDOT, 2 = MAG_SP1, 3 = MAG_SP2			281	2	UINT
	MAG_SFZ					
			Value			
			Value 0			
	State					
	State AUTO_MODE		0			
	State AUTO_MODE BDOT_MODE		0			



AMSAT RC_ADCS_BDOT_7

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read ReceivedTimeFormattedConversion Conversion:					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT		
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set	195	29	UINT		



	of headers. Id Value: 308871793					
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_BDOT_7_SPAM_MAGNITUDE_X	None		224	8	INT	
RC_ADCS_BDOT_7_SPAM_MAGNITUDE_Y	None	232	8	INT		
RC_ADCS_BDOT_7_SPAM_MAGNITUDE_Z	None	240	8	INT		
RC_ADCS_BDOT_7_SPAM_OFF_X_MTQ_X	Last spam reading with m	248	16	INT	nT	
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_7_SPAM_OFF_X_MTQ_Y	Last spam reading with m	tq off 1/73 nT	264	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_7_DIPOLE_GAIN_X	None	280	80 8	UINT		
	Read Conversion:	value / 100.0				

AMSAT RC_ADCS_BDOT_8

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	COSMOS Packet Time (UTC, Floating point, Unix epoch)			DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tin	ne (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T	Fime (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rec	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					



LENGTH Length of TCP-ized CAN message (always 36/0x24 16 UINT bytes) UINT FIXED_TYPE Fixed message type for CAN 16 16 Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 UINT hardware/software. 32 TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is 96 UINT the lower 4 bytes of the timestamp. 128 32 UINT TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp. **CHANNEL** NOT USED in current PCAN-Ethernet Gateway DR 160 8 **UINT** hardware/software. DLC Date Length Count from the CAN message. 168 8 **UINT FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 UINT hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 UINT CANID_RTR RTR value. 193 1 **UINT** CANID_TYPE 194 Indicates whether the message is a standard or 1 **UINT** extended frame. CANID_ID The ID (normal or extended) portion of the 'CAN ID' set 195 29 UINT of headers. Id Value: 308871794 **State** Value **EXTENDED** 1 **STANDARD** 0 RC_ADCS_BDOT_8_SPAM_OFF_X_MTQ_Z Last spam reading with mtq off 1/73 nT 224 16 INT nΤ Read Conversion: value * 73.0 RC_ADCS_BDOT_8_SPAM_OFF_Y_MTQ_X Last spam reading with mtq off 1/73 nT 240 16 INT nΤ Read Conversion: value * 73.0 RC_ADCS_BDOT_8_SPAM_OFF_Y_MTQ_Y Last spam reading with mtq off 1/73 nT 256 16 INT nΤ Read Conversion: value * 73.0 272 RC_ADCS_BDOT_8_SPAM_OFF_Y_MTQ_Z Last spam reading with mtq off 1/73 nT 16 INT nΤ Read Conversion: value * 73.0

AMSAT RC_ADCS_BDOT_9



Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read ReceivedTimeFormattedConversion Conversion:					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT		
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers.	195	29	UINT		



	Id Value: 308871795					
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_BDOT_9_SPAM_OFF_Z_MTQ_X	Last spam reading with mtq off	1/73 nT	224	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_9_SPAM_OFF_Z_MTQ_Y	Last spam reading with mtq off 1/73 nT			16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_9_SPAM_OFF_Z_MTQ_Z	Last spam reading with mtq off	1/73 nT	256	16	INT	nT
	Read Conversion:	value * 73.0				
RC_ADCS_BDOT_9_DIPOLE_GAIN_Y	None		272	8	UINT	
	Read Conversion:	value / 100.0				
RC_ADCS_BDOT_9_DIPOLE_GAIN_Z	None			8	UINT	
	Read Conversion:	value / 100.0				

AMSAT RC_ADCS_BDOT_H1

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string) Read Conversion: Packet TimeFormattedConversion			0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion						
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					

LENGTH	Length of TCP-ized C	CAN message (alw	ays 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type Id Value: 128	for CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		icroseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		icroseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	160	8	UINT	
DLC	Date Length Count f	rom the CAN me	ssage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	served.		192	1	UINT	
CANID_RTR	RTR value.	RTR value.			1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	headers.	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 308871780			29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD 0						
RC_ADCS_BDOT_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.	.0 YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespor	nse				
RC_ADCS_BDOT_H1_TEMP_MAX	Temperature of MSP			240	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:		.0 YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespor					
							_
RC_ADCS_BDOT_H1_TEMP_AVG	Temperature of MSP			256	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:		.0 YH/30.0 RH/35.0				
	Limits Response:	Limits Response: Slacklimitresponse					



RC_ADCS_BDOT_H1_SYSRSTIV 272 UINT Reason for reset 8 State Value NO_INTERRUPT_PENDING 0 2 (BOR)_BROWNOUT (BOR)_RSTIFG_RST/NMI 6 8 (BOR)_LPMX.5_WAKE_UP 10 (BOR)_SECURITY_VIOLATION 14 (BOR)_SVSHIFG_SVSH_EVENT (POR)_PMMSWPOR_SOFTWARE_POR 20 (PUC)_WDTIFG_WATCHDOG_TIMEOUT 22 24 (PUC)_WDTPW_PASSWORD_VIOLATION 26 (PUC)_FRCTLPW_PASSWORD_VIOLATION (PUC)_UNCORRECTABLE_FRAM_BIT_ERR 28 (PUC)_PERIPHERAL_AREA_FETCH 30 (PUC)_PMMPW_PMM_PWD_VIOLATION 32 (PUC)_MPUPW_MPU_PWD_VIOLATION 34 36 (PUC)_CSPW_CS_PASSWORD_VIOLATION (PUC)_MPUSEGIPIFGENCAPIPMEMSEG 38 (PUC)_MPUSEGIIFGINFOMEMSEGVIOL 40 (PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL 42 (PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL 44 (PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL 46 UINT RC_ADCS_BDOT_H1_RESET_COUNT Reset Count 280 8

AMSAT RC_ADCS_BDOT_H2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					



0 RECEIVED_COUNT COSMOS packet received count 0 **DERIVED** Read Conversion: ReceivedCountConversion LENGTH Length of TCP-ized CAN message (always 36/0x24 bytes) 0 16 UINT FIXED_TYPE Fixed message type for CAN 16 16 UINT Id Value: 128 TAG 32 UINT NOT USED in current PCAN-Ethernet Gateway DR 64 hardware/software. Timestamp of the CAN message, in microseconds. This is the TIMESTAMP_L 96 32 UINT lower 4 bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the 128 32 **UINT** upper 4 bytes of the timestamp. **CHANNEL** NOT USED in current PCAN-Ethernet Gateway DR 160 8 **UINT** hardware/software. DLC 8 UINT Date Length Count from the CAN message. 168 **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 **UINT** hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 **UINT** CANID_RTR RTR value. 193 1 UINT CANID_TYPE Indicates whether the message is a standard or extended UINT 194 1 UINT CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 Id Value: 308871789 State Value **EXTENDED** 1 0 **STANDARD**

AMSAT RC_ADCS_ESTIM_1

RC_ADCS_BDOT_H2_CANRXERROR

PADDING

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (U	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	version: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (L	COSMOS Packet Time (Local time zone, Formatted string)		0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					

224

232

8

56

UINT

UINT

the BDOT MCP's RX error buffer

Padded bits for CAN data



RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating po	pint, Unix epoch)	0	0	DERIVED	%0.6
	Read Conversion:	ReceivedTimeSe	condsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFor	mattedConversion				
RECEIVED_COUNT	COSMOS packet rece	ved count		0	0	DERIVED	
	Read Conversion:	ReceivedCou	untConversion				
LENGTH	Length of TCP-ized C	AN message (always	36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAI bytes of the timestam	96	32	UINT			
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN messag	e.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a standa	ard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext Id Value: 3078231		ne 'CAN ID' set of headers.	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
PADDING	Padded bits for CAN o	Padded bits for CAN data			64	UINT	

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion						



0 PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string) 0 **DERIVED** Read Conversion: PacketTimeFormattedConversion RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch) 0 **DERIVED** %0.6f Read Conversion: ReceivedTimeSecondsConversion 0 RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) **DERIVED** Read Conversion: ReceivedTimeFormattedConversion RECEIVED_COUNT COSMOS packet received count 0 0 **DERIVED** ReceivedCountConversion Read Conversion: **LENGTH** Length of TCP-ized CAN message (always 36/0x24 bytes) 0 16 **UINT** UINT FIXED_TYPE Fixed message type for CAN 16 16 Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 UINT hardware/software. TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is the lower 4 96 32 UINT bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper $% \left\{ 1,2,...,n\right\}$ 128 32 UINT 4 bytes of the timestamp. **CHANNEL** NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 UINT 16 hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 UINT CANID_RTR RTR value. 193 1 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. 194 UINT 1 CANID ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 29 UINT 195 Id Value: 307823189 State Value **EXTENDED** 1 STANDARD 0

AMSAT RC_ADCS_ESTIM_11

RC_ADCS_ESTIM_10_SUN_Y y component of unit vector from spacecraft to sun

224

64

FLOAT

%0.4f



Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poin	t, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	OSMOS Packet Time (Local time zone, Formatted string)				DERIVED		
	Read Conversion:	Read Conversion: PacketTimeFormattedConversion						
RECEIVED_TIMESECONDS	COSMOS Received Tin	OSMOS Received Time (UTC, Floating point, Unix epoch)				DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone,	Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ıntConversion					
LENGTH	Length of TCP-ized CA	AN message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		seconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messag	e.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	Indicates whether the message is a standard or extended frame.				UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823190				29	UINT		
	State	State Value						
	EXTENDED							
	STANDARD	TANDARD 0						



 $\label{eq:component} \mbox{RC_ADCS_ESTIM_11_SUN_Z} \quad \mbox{z component of unit vector from spacecraft to sun}$

224

64

FLOAT

%0.4f

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	OSMOS Received Time (UTC, Floating point, Unix epoch)				DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved c	punt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		sage, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		sage, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN	-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om th	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN	-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	Indicates whether the message is a standard or extended frame.			1	UINT		
CANID_ID	The ID (normal or ext Id Value: 30782319		d) portion of the 'CAN ID' set of headers.	195	29	UINT		



	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_ESTIM_12_MAG_X	x component of unit vector of the direction	on of the magnetic field	224	64	FLOAT	%0.4f

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	SMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed c	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	N	16	16	UINT		
TAG	NOT USED in current I hardware/software.	PCAN	-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		sage, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		sage, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current I hardware/software.	PCAN	-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	m th	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current I hardware/software.	PCAN	-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		



_						
CANID_TYPE	Indicates whether the message is a standard	or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'Id Value: 307823192	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823192				
	State	State Value				
	EXTENDED 1	L				
	STANDARD)				
RC_ADCS_ESTIM_13_	MAG_Y y component of unit vector of the direction	of the magnetic field	224	64	FLOAT	%0.4f

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (I	UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (I	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	l message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN	16	16	UINT		
TAG	NOT USED in current Ponardware/software.	CAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN r	message, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN r 4 bytes of the timestam	message, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current Pohardware/software.	CAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count from	n the CAN message.	168	8	UINT		

%0.4f



atellite Lab					
FLAGS	NOT USED in current PCAN-Ethernet Gat hardware/software.	reway DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT
CANID_RTR	RTR value.		193	1	UINT
CANID_TYPE	Indicates whether the message is a stand	lard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or extended) portion of t Id Value: 307823193	he 'CAN ID' set of headers.	195	29	UINT
	State	Value			
	EXTENDED	1			
	STANDARD	0			

224

64

FLOAT

AMSAT RC_ADCS_ESTIM_2

RC_ADCS_ESTIM_14_MAG_Z z component of unit vector of the direction of the magnetic field

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Conversion: PacketTimeSecondsConversion						
PACKET_TIMEFORMATTED	COSMOS Packet Time (DSMOS Packet Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:							
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UT	ГС, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed co	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	N me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN	I	16	16	UINT		
TAG	NOT USED in current Polardware/software.	IOT USED in current PCAN-Ethernet Gateway DR ardware/software.			64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp	imestamp of the CAN message, in microseconds. This is the lower 4 ytes of the timestamp.			32	UINT		
TIMESTAMP_H	Timestamp of the CAN	mess	sage, in microseconds. This is the upper	128	32	UINT		



	4 bytes of the timestamp.	4 bytes of the timestamp.					
CHANNEL	NOT USED in current PCAN-Ethernet Gate hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.					
DLC	Date Length Count from the CAN messag	Date Length Count from the CAN message.					
FLAGS	NOT USED in current PCAN-Ethernet Gate hardware/software.	176	16	UINT			
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT		
CANID_RTR	RTR value.	RTR value.					
CANID_TYPE	Indicates whether the message is a standa	rd or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the Id Value: 307823149	e 'CAN ID' set of headers.	195	29	UINT		
	State	Value					
	EXTENDED	1					
	STANDARD	0					
RC_ADCS_ESTIM_2_POS_X	Inertial position that the ADCS system thin	ks the satellite is at	224	64	FLOAT	m	%0.1f

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)			0	0	DERIVED		%0.6f
	Read Conversion:	F	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (U	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	R	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved c	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAI	N	16	16	UINT		
TAG	NOT USED in current	PCAN	l-Ethernet Gateway DR	32	64	UINT		



	hardware/software.						
TIMESTAMP_L	Timestamp of the CAN message, in micros bytes of the timestamp.	96	32	UINT			
TIMESTAMP_H	Timestamp of the CAN message, in micros 4 bytes of the timestamp.	128	32	UINT			
CHANNEL	NOT USED in current PCAN-Ethernet Gate hardware/software.	160	8	UINT			
DLC	Date Length Count from the CAN message	Date Length Count from the CAN message.					
FLAGS	NOT USED in current PCAN-Ethernet Gate hardware/software.	176	16	UINT			
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT			
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the message is a standa	rd or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the Id Value: 307823150	e 'CAN ID' set of headers.	195	29	UINT		
	State	Value					
	EXTENDED	1					
	STANDARD						
RC_ADCS_ESTIM_3_POS_Y	Inertial position that the ADCS system thin	ks the satellite is at	224	64	FLOAT	m	%0.1f

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Loca	time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch)			0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed co	unt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					



LENGTH Length of TCP-ized CAN message (always 36/0x24 bytes) 0 **UINT** 16 FIXED_TYPE Fixed message type for CAN 16 16 UINT Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 UINT hardware/software. Timestamp of the CAN message, in microseconds. This is the lower 4 96 32 **UINT** TIMESTAMP_L bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper 128 32 UINT 4 bytes of the timestamp. CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC 168 8 UINT Date Length Count from the CAN message. **FLAGS** UINT NOT USED in current PCAN-Ethernet Gateway DR 176 16 hardware/software. CANID_PADDING **UINT** Fixed value of 0 - reserved. 192 1 CANID_RTR RTR value. 193 UINT 1 CANID_TYPE 194 1 UINT Indicates whether the message is a standard or extended frame. CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 **UINT** Id Value: 307823151 State Value **EXTENDED** 1 **STANDARD** 0

AMSAT RC_ADCS_ESTIM_5

RC_ADCS_ESTIM_4_POS_Z

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					

224

64

FLOAT

%0.1f

m

Inertial position that the ADCS system thinks the satellite is at



0 RECEIVED_COUNT COSMOS packet received count **DERIVED** Read Conversion: ReceivedCountConversion **LENGTH** Length of TCP-ized CAN message (always 36/0x24 bytes) 0 16 **UINT** 16 FIXED_TYPE Fixed message type for CAN 16 UINT Id Value: 128 TAG 32 64 UINT NOT USED in current PCAN-Ethernet Gateway DR hardware/software. TIMESTAMP_L 96 UINT Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp. 32 **UINT** TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper 128 4 bytes of the timestamp. CHANNEL 160 8 UINT NOT USED in current PCAN-Ethernet Gateway DR hardware/software. DLC Date Length Count from the CAN message. 168 **UINT FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 UINT hardware/software. CANID_PADDING 192 UINT Fixed value of 0 - reserved. 1 CANID_RTR RTR value. 193 **UINT** CANID_TYPE Indicates whether the message is a standard or extended frame. 194 1 **UINT** CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT Id Value: 307823152 **State** Value **EXTENDED** 1 0 **STANDARD**

AMSAT RC_ADCS_ESTIM_6

RC_ADCS_ESTIM_5_VEL_X

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					

224

FLOAT

m/s

%0.4f

The inertial velocity the satellite thinks we have



Copies are Uncontrolled Date: 11/30/2018

RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone	, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	AN message (always	36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CA bytes of the timestan	nestamp of the CAN message, in microseconds. This is the lower 4 tes of the timestamp.			32	UINT	
TIMESTAMP_H		mestamp of the CAN message, in microseconds. This is the upper bytes of the timestamp.			32	UINT	
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			8	UINT	
DLC	Date Length Count fr	om the CAN messa	ge.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a stand	ard or extended frame.	194	1	UINT	
CANID_ID		The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823153		195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (I	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
DACKET TIMEFORMATTED	COSMOS Dacket Time //	and time zone Cormatted string)	0		DEDIVED.		
PACKET_TIMEFORMATTED	COSMOS Packet Time (1	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					



RECEIVED_TIMESECONDS	COSMOS Received Tir	ne (UTC, Floating point, Unix epocl	1) 0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSecondsConvers	on			
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zone, Formatted str	ng) 0	0	DERIVED	
	Read Conversion:	ReceivedTimeFormattedConver	sion			
RECEIVED_COUNT	COSMOS packet rece	ved count	0	0	DERIVED	
	Read Conversion:	ReceivedCountConversion				
LENGTH	Length of TCP-ized Ca	AN message (always 36/0x24 bytes	5) 0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT	
TAG	NOT USED in current hardware/software.	「USED in current PCAN-Ethernet Gateway DR dware/software.				
TIMESTAMP_L	Timestamp of the CAI bytes of the timestam	estamp of the CAN message, in microseconds. This is the lower 4 es of the timestamp.				
TIMESTAMP_H		imestamp of the CAN message, in microseconds. This is the upper bytes of the timestamp.				
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN message.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	rved.	192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the	message is a standard or extended	d frame. 194	1	UINT	
CANID_ID	The ID (normal or ext Id Value: 3078231	ended) portion of the 'CAN ID' set	of headers. 195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				

Item Name	Description	Bit Offset	Bit Size	Data Type	Units I	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

	Read Conversion:	PacketTimeSe	econdsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	e (Local time zon	e, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFor	mattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floatin	g point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeS	SecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zo	one, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFo	ormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCo	ountConversion					
LENGTH	Length of TCP-ized C	AN message (alw	ays 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type t	for CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		croseconds. This is the	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		croseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	160	8	UINT		
DLC	Date Length Count f	rom the CAN mes	ssage.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the frame.	e message is a sta	andard or extended	194	1	UINT		
CANID_ID	The ID (normal or exheaders. Id Value: 3078231		of the 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
DC ADCC ESTIM 9 FDCCU	Enoch wood in the	n and wala = to	skulation	224	40	I IINIT		0/ 05
RC_ADCS_ESTIM_8_EPOCH	Epoch used in position	n and velocity ca		224	40	UINT	S	%.0f
	Read Conversion:		value >> 8					



PADDING

264 INT RC_ADCS_ESTIM_8_SGP4_FLAG Flag telling what mode ESTIM is propagating the orbit in UINT Boolean indicating whether the s/c thinks it is in the sun or not. 272 1 RC_ADCS_ESTIM_8_SC_IN_SUN **State** Value FALSE 0 **TRUE** 1 RC_ADCS_ESTIM_8_SC_ABOVE_GS Boolean indicating whether the $\mbox{s/c}$ thinks it is above the UW 273 **UINT** ground station or not. State Value **FALSE** 0 **TRUE** 1 UINT RC_ADCS_ESTIM_8_TLE_ID TLE ID valid bit 274 1 **State** Value **FALSE** 0 1 **TRUE**

275

13

UINT

AMSAT RC_ADCS_ESTIM_9

Padded bits for CAN data

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Р	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Loca	l time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (Ul	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed co	punt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					



0 LENGTH Length of TCP-ized CAN message (always 36/0x24 bytes) 16 **UINT** FIXED_TYPE Fixed message type for CAN 16 16 **UINT** Id Value: 128 UINT TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 hardware/software. UINT TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is the lower ${\bf 4}$ 96 32 bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper 128 32 **UINT** 4 bytes of the timestamp. **CHANNEL** NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 UINT hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 **UINT** CANID_RTR RTR value. 193 1 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. 194 1 UINT CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 **UINT** Id Value: 307823188 **State** Value **EXTENDED** 1 0 **STANDARD**

AMSAT RC_ADCS_ESTIM_H1

RC_ADCS_ESTIM_9_SUN_X

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					

224

FLOAT

%0.4f

x component of unit vector from spacecraft to sun

RECEIVED_COUNT	COSMOS packet rece	eived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized C	AN message (alw	vays 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f	for CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		icroseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		icroseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	160	8	UINT	
DLC	Date Length Count from the CAN message.			168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Ethernet	Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the frame.	3		194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823201			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_ESTIM_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20	.0 YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespor	nse				
RC_ADCS_ESTIM_H1_TEMP_MAX	Temperature of MSP			240	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.	L/20.0 YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespor	nse				
RC_ADCS_ESTIM_H1_TEMP_AVG	Temperature of MSP			256	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]: RL/15.0 YL/20.0 YH/30.0 RH/35.0						



Limits Response:	Slacklimitresponse

C_ADCS_ESTIM_H1_SYSRSTIV	Reason for reset		272	8	UINT
	State	Value			
	NO_INTERRUPT_PENDING	0			
	(BOR)_BROWNOUT	2			
	(BOR)_RSTIFG_RST/NMI	6			
	(BOR)_LPMX.5_WAKE_UP	8			
	(BOR)_SECURITY_VIOLATION	10			
	(BOR)_SVSHIFG_SVSH_EVENT	14			
	(POR)_PMMSWPOR_SOFTWARE_POR	20			
	(PUC)_WDTIFG_WATCHDOG_TIMEOUT	22			
	(PUC)_WDTPW_PASSWORD_VIOLATION	24			
	(PUC)_FRCTLPW_PASSWORD_VIOLATION	26			
	(PUC)_UNCORRECTABLE_FRAM_BIT_ERR	28			
	(PUC)_PERIPHERAL_AREA_FETCH	30			
	(PUC)_PMMPW_PMM_PWD_VIOLATION	32			
	(PUC)_MPUPW_MPU_PWD_VIOLATION	34			
	(PUC)_CSPW_CS_PASSWORD_VIOLATION	36			
	(PUC)_MPUSEGIPIFGENCAPIPMEMSEG	38			
	(PUC)_MPUSEGIIFGINFOMEMSEGVIOL	40			
	(PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL	42			
	(PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL	44			
	(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL	46			

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					



RECEIVED_TIMEFORMATTED	COSMOS Received T	ïme (Local time zo	one, Formatted string)	0	0	DERIVED
	Read Conversion:	ReceivedTimeFo	ormattedConversion			
RECEIVED_COUNT	COSMOS packet reco	eived count		0	0	DERIVED
	Read Conversion:	ReceivedCo	ountConversion			
LENGTH	Length of TCP-ized (CAN message (alw	ays 36/0x24 bytes)	0	16	UINT
FIXED_TYPE	Fixed message type Id Value: 128	for CAN		16	16	UINT
TAG	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	32	64	UINT
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		croseconds. This is the	96	32	UINT
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		croseconds. This is the	128	32	UINT
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	160	8	UINT
DLC	Date Length Count f	rom the CAN me	ssage.	168	8	UINT
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - res	served.		192	1	UINT
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether th frame.	e message is a sta	andard or extended	194	1	UINT
CANID_ID	The ID (normal or exheaders. Id Value: 3078232		of the 'CAN ID' set of	195	29	UINT
	State		Value			
	EXTENDED		1			
	STANDARD		0			
RC_ADCS_ESTIM_H2_CANRXERROR	Estim MCP's RX error	r buffer		224	8	UINT
PADDING	Padded bits for CAN	data		232	56	UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (COSMOS Packet Time (UTC, Floating point, Unix epoch)					%0.6f
	Read Conversion:	lead Conversion: PacketTimeSecondsConversion					



PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeF	ormattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floatin	g point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTim	eSecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zo	one, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTime	FormattedConversion				
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED	
	Read Conversion:	Received	CountConversion				
LENGTH	Length of TCP-ized Ca	AN message (alw	ays 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAI bytes of the timestam		croseconds. This is the lower 4	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAI 4 bytes of the timesta		croseconds. This is the upper	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN mes	ssage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a sta	andard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext Id Value: 3078231		of the 'CAN ID' set of headers.	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
PADDING	Padded bits for CAN o	lata		224	64	UINT	

AMSAT RC_ADCS_MPC_10

Bit Bit **Data Item Name** Description Offset Size



PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poin	t, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, F	ormatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating po	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone	, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ıntConversion					
LENGTH	Length of TCP-ized CA	AN message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128						
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messag	je.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a stand	ard or extended frame.	194	1	UINT		
CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823165					29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD 0							
RC_ADCS_MPC_10_OMEGA_Y	None			224	64	FLOAT	r/s	%0.3f



Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poin	t, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSeco	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Fo	ormatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	attedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating po	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSec	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	SMOS Received Time (Local time zone, Formatted string)				DERIVED		
	Read Conversion:	ReceivedTimeForm	mattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ntConversion					
LENGTH	Length of TCP-ized CA	AN message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messag	e.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gate	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a standa	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or ext headers. Id Value: 30782316		ne 'CAN ID' set of	195	29	UINT		
	State		Value					



Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	ne (U	ГС, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed co	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	r CAN	1	16	16	UINT		
TAG	NOT USED in current F hardware/software.	PCAN	-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp		sage, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestar		sage, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current F hardware/software.	PCAN	-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	m th	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current F hardware/software.	PCAN	-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reser	ved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		



CANID_TYPE 194 1 UINT Indicates whether the message is a standard or extended frame. CANID_ID The $\ensuremath{\mathtt{ID}}$ (normal or extended) portion of the 'CAN $\ensuremath{\mathtt{ID}}$ ' set of headers. 195 29 UINT Id Value: 307823167 State Value **EXTENDED** 1 STANDARD 0 PADDING Padded bits for CAN data 224 64 UINT

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	l time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ead Conversion: PacketTimeFormattedConversion						
RECEIVED_TIMESECONDS	COSMOS Received Tin	OSMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	COSMOS Received Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed co	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	r CAN	I	16	16	UINT		
TAG	NOT USED in current l hardware/software.	PCAN	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestam		sage, in microseconds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	•	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			32	UINT		
CHANNEL	NOT USED in current l hardware/software.	OT USED in current PCAN-Ethernet Gateway DR			8	UINT		
DLC	Date Length Count fro	m th	e CAN message.	168	8	UINT		
FLAGS	NOT USED in current l	PCAN	Ethernet Gateway DR	176	16	UINT		



	hardware/software.				
CANID_PADDING	Fixed value of 0 - reserved.			1	UINT
CANID_RTR	RTR value.	RTR value.			UINT
CANID_TYPE	Indicates whether the message is a standa	ard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823168			29	UINT
	State	Value			
	EXTENDED	1			
	STANDARD	0			
PADDING	Padded bits for CAN data		224	64	UINT

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ad Conversion: PacketTimeFormattedConversion						
RECEIVED_TIMESECONDS	COSMOS Received Tir	MOS Received Time (UTC, Floating point, Unix epoch)				DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	DSMOS Received Time (Local time zone, Formatted string)				DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved c	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			64	UINT		
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			32	UINT		
TIMESTAMP_H		Fimestamp of the CAN message, in microseconds. This is the upper bytes of the timestamp.			32	UINT		

160

168

176

192

193

194

195

8

16

1

1

1

29

UINT

UINT



CHANNEL

DLC

FLAGS

CANID_PADDING

CANID_RTR

CANID_TYPE

CANID_ID

UINT
UINT
UINT
UINT
UINT
UINT

10 Value: 30/823109								
State	Value							
EXTENDED	1							
STANDARD	0							

Indicates whether the message is a standard or extended frame.

The ID (normal or extended) portion of the 'CAN ID' set of headers.

NOT USED in current PCAN-Ethernet Gateway DR

NOT USED in current PCAN-Ethernet Gateway DR

Date Length Count from the CAN message.

hardware/software.

hardware/software.

RTR value.

Fixed value of 0 - reserved.

PADDING Padded bits for CAN data 224 64 UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized Ca	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128			UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		



TIMESTAMP_L 96 32 UINT Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp. Timestamp of the CAN message, in microseconds. This is the TIMESTAMP_H 32 **UINT** 128 upper 4 bytes of the timestamp. CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC 8 UINT Date Length Count from the CAN message. 168 **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 **UINT** hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 1 **UINT** CANID_RTR RTR value. 193 **UINT** CANID_TYPE Indicates whether the message is a standard or extended frame. **UINT** 194 1 CANID_ID 29 UINT The ID (normal or extended) portion of the 'CAN ID' set of 195 headers. Id Value: 307823170 **State** Value **EXTENDED** 1 0 **STANDARD** ${\sf RC_ADCS_MPC_15_SC_MODE}$ The current operating mode of the ADCS system 224 8 **UINT** Proportion of samples where attitude is within 20 degrees of 232 8 **UINT** RC_ADCS_MPC_15_POINT_TRUE

AMSAT RC_ADCS_MPC_2

PADDING

commanded vector

Padded bits for CAN data

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		

240

48

UINT



	Read Conversion:	ReceivedCou	untConversion				
LENGTH	Length of TCP-ized CAN n	nessage (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Ca Id Value: 128	AN		16	16	UINT	
TAG	NOT USED in current PCA hardware/software.	N-Ethernet Ga	teway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN med 4 bytes of the timestamp.		oseconds. This is the lower	96	32	UINT	
TIMESTAMP_H		nestamp of the CAN message, in microseconds. This is the per 4 bytes of the timestamp.			32	UINT	
CHANNEL	NOT USED in current PCA hardware/software.	OT USED in current PCAN-Ethernet Gateway DR ardware/software.				UINT	
DLC	Date Length Count from the CAN message.				8	UINT	
FLAGS	NOT USED in current PCA hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT	
CANID_PADDING	Fixed value of 0 - reserved	d.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the me	ssage is a stand	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended headers. Id Value: 307823157	ed) portion of	the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_MPC_2_SC_QUAT_1	The first element of the at	titude quaterni	ion of the spacecraft	224	64	FLOAT	%0.4f

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					



RECEIVED_TIMEFORMATTED	COSMOS Received Ti	ime (Local time zon	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet rece	aived count		0	0	DERIVED	
RECEIVED_COOM				U	O	DENIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	AN message (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	: PCAN-Ethernet Ga	teway DR	32	64	UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	128	32	UINT			
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				8	UINT	
DLC	Date Length Count f	rom the CAN messa	age.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a stand	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ex headers. Id Value: 3078231		the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_MPC_3_SC_QUAT_2	The second element	of the attitude quat	ernion of the spacecraft	224	64	FLOAT	%0.4f
			•				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					



RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating p	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSe	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet receiv	ved count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized CA	NN message (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.			64	UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			8	UINT	
DLC	Date Length Count fro	om the CAN messa	nge.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Ga	teway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a stand	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended headers. Id Value: 30782315		the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_MPC_4_SC_QUAT_3	The third element of the	ne attitude quaterr	nion of the spacecraft	224	64	FLOAT	%0.4f

Item Name	Description	Bit Offset	Bit Size	Data Type	Units Form	at
PACKET TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED	%0.6	5f

	Read Conversion:	PacketTimeSec	ondsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, F	Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeForn	nattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating p	oint, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSe	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFor	rmattedConversion				
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED	
	Read Conversion:	ReceivedCou	untConversion				
LENGTH	Length of TCP-ized C	AN message (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128				UINT	
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				64	UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				UINT	
TIMESTAMP_H	Timestamp of the CAI upper 4 bytes of the		seconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gat	ceway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN messa	ge.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	ceway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a stanc	lard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extheaders. Id Value: 3078231	,,	the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_MPC_5_SC_QUAT_4	The fourth element of	f the attitude quate	rnion of the spacecraft	224	64	FLOAT	%0.4f



Item Name	Description	cription			Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poi	nt, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, F	Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForn	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating p	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone	e, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ıntConversion					
LENGTH	Length of TCP-ized CA	AN message (always	s 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128			16	UINT		
TAG	NOT USED in current hardware/software.	IOT USED in current PCAN-Ethernet Gateway DR ardware/software.		32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		seconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gat	reway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messa	ge.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gal	reway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	Indicates whether the message is a standard or extended frame.		194	1	UINT		
CANID_ID	The ID (normal or ext headers. Id Value: 30782316		he 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					



	STANDARD	0					
RC_ADCS_MPC_6_OMEGA_MIN	None		224	64	FLOAT	r/s	%0.3f

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the t	N message, in microseconds. This is the imestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	N message, in microseconds. This is the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fi	rom the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	erved.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	e message is a standard or extended frame	. 194	1	UINT		



CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 UINT headers. Id Value: 307823162 State Value **EXTENDED** 1 0 STANDARD RC_ADCS_MPC_7_OMEGA_MAX None 224 FLOAT r/s %0.3f

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion			DERIVED		
LENGTH	Length of TCP-ized CA	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta	N message, in microseconds. This is the lower mp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t	N message, in microseconds. This is the imestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN message.	168	8	UINT		
FLAGS	NOT USED in current	PCAN-Ethernet Gateway DR	176	16	UINT		



	hardware/software.					
CANID_PADDING	Fixed value of 0 - reserved.			1	UINT	
CANID_RTR	RTR value.			1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823163			29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pā	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local	time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pad	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Red	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ived co	unt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN mes	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		32	64	UINT			
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.		96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		age, in microseconds. This is the upper	128	32	UINT		



CHANNEL 160 8 UINT NOT USED in current PCAN-Ethernet Gateway DR hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 UINT hardware/software. CANID_PADDING 192 UINT Fixed value of 0 - reserved. 1 CANID_RTR RTR value. 193 1 UINT CANID_TYPE UINT Indicates whether the message is a standard or extended frame. 194 CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT Id Value: 307823164 State Value **EXTENDED** 1 0 **STANDARD**

224

FLOAT

r/s

%0.3f

AMSAT RC_ADCS_MPC_H1

RC_ADCS_MPC_9_OMEGA_X None

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Received Time Formatted Conversion					
RECEIVED_COUNT	COSMOS packet recei	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		

TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		croseconds. Th	nis is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		croseconds. Th	nis is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet (Gateway DR		160	8	UINT	
DLC	Date Length Count f	from the CAN mes	ssage.		168	8	UINT	
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet (Gateway DR		176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	served.			192	1	UINT	
CANID_RTR	RTR value.	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether th frame.	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	headers.	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 308871778			195	29	UINT	
	State		Value					
	EXTENDED	XTENDED 1						
	STANDARD	STANDARD 0						
RC_ADCS_MPC_H1_TEMP_MIN	Temperature of MSP	Temperature of MSP				16	INT	С
	Read Conversion:	value / 100.0						
	Limits [DEFAULT]:	RL/15.0 YL/20.	0 YH/30.0 RH /	35.0				
	Limits Response:	Slacklimitrespor	nse					
RC_ADCS_MPC_H1_TEMP_MAX	Temperature of MSP				240	16	INT	С
	Read Conversion:	value / 100.0						
	Limits [DEFAULT]:	RL/15.0 YL/20.	0 YH/30.0 RH /	35.0				
	Limits Response:	Slacklimitrespor	nse					
RC_ADCS_MPC_H1_TEMP_AVG	Temperature of MSP				256	16	INT	С
	Read Conversion:							
	Limits [DEFAULT]:							
	Limits Response:	Slacklimitrespor	ise					
RC_ADCS_MPC_H1_SYSRSTIV	Reason for reset				272	8	UINT	
			Value					
		D_INTERRUPT_PENDING 0						
		(BOR)_BROWNOUT 2						
	(BOR)_RSTIFG_RST	Γ/ΝΜΙ		6				



(BOR)_LPMX.5_WAKE_UP 8 (BOR)_SECURITY_VIOLATION 10 (BOR)_SVSHIFG_SVSH_EVENT 14 (POR)_PMMSWPOR_SOFTWARE_POR 20 (PUC)_WDTIFG_WATCHDOG_TIMEOUT 22 (PUC)_WDTPW_PASSWORD_VIOLATION 24 (PUC)_FRCTLPW_PASSWORD_VIOLATION 26 (PUC)_UNCORRECTABLE_FRAM_BIT_ERR 28 (PUC)_PERIPHERAL_AREA_FETCH 30 (PUC)_PMMPW_PMM_PWD_VIOLATION 32 $(PUC)_MPUPW_MPU_PWD_VIOLATION$ 34 $(PUC)_CSPW_CS_PASSWORD_VIOLATION$ 36 (PUC)_MPUSEGIPIFGENCAPIPMEMSEG 38 (PUC)_MPUSEGIIFGINFOMEMSEGVIOL 40 42 (PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL (PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL 44

46

RC_ADCS_MPC_H1_RESET_COUNT Reset Count

280 8 UINT

Date: 11/30/2018

AMSAT RC_ADCS_MPC_H2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	10S Received Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved count	0	0	DERIVED		
_	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	N message (always 36/0x24 bytes)	0	16	UINT		

(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL



FIXED_TYPE Fixed message type for CAN 16 16 **UINT** Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 64 UINT hardware/software. TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is the 96 32 **UINT** lower 4 bytes of the timestamp. Timestamp of the CAN message, in microseconds. This is the 32 **UINT** TIMESTAMP_H 128 upper 4 bytes of the timestamp. CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 8 UINT hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 16 **UINT** hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 1 UINT Indicates whether the message is a standard or extended CANID_TYPE 194 1 **UINT** CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 UINT headers. Id Value: 308871787 **State** Value **EXTENDED** 1 0 **STANDARD** RC_ADCS_MPC_H2_CANRXERROR the MPC MCP's RX error buffer 224 8 **UINT**

AMSAT RC_ADCS_MTQ_1

Padded bits for CAN data

PADDING

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone, Formatted string)	0	0	DERIVED		

232

56

UINT



	Read Conversion:	ReceivedTimeFor	mattedConversion			
RECEIVED_COUNT	COSMOS packet receiv	ed count		0	0	DERIVED
	Read Conversion:	ReceivedCou	ntConversion			
LENGTH	Length of TCP-ized CAI	N message (always	36/0x24 bytes)	0	16	UINT
FIXED_TYPE	Fixed message type for Id Value: 128	r CAN		16	16	UINT
TAG	NOT USED in current P hardware/software.	CAN-Ethernet Gate	eway DR	32	64	UINT
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp		econds. This is the lower 4	96	32	UINT
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestan		econds. This is the upper	128	32	UINT
CHANNEL	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	160	8	UINT
DLC	Date Length Count from	m the CAN messag	e.	168	8	UINT
FLAGS	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - reser	ved.		192	1	UINT
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether the r	nessage is a standa	ard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or exte		e 'CAN ID' set of headers.	195	29	UINT
	State		Value			
	EXTENDED		1			
	STANDARD		0			
PADDING	Padded bits for CAN da	ita		224	64	UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f



				1		
	Read Conversion:	ReceivedTimes	SecondsConversion			
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	COSMOS Received Time (Local time zone, Formatted string)				DERIVED
	Read Conversion:	Read Conversion: ReceivedTimeFormattedConversion				
		1000 00 1100 00 1100 00 1100 00 1100 00				
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED
	Read Conversion:	ReceivedCo	ountConversion			
LENGTH	Length of TCP-ized C	ength of TCP-ized CAN message (always 36/0x24 bytes)				UINT
FIXED_TYPE		ixed message type for CAN			16	UINT
	Id Value: 128					
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.			64	UINT
TIMESTAMP_L		imestamp of the CAN message, in microseconds. This is the wer 4 bytes of the timestamp.				UINT
TIMESTAMP_H		imestamp of the CAN message, in microseconds. This is the pper 4 bytes of the timestamp.				UINT
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				UINT
DLC	Date Length Count from the CAN message.			168	8	UINT
FLAGS	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether the	message is a sta	ndard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or ext headers. Id Value: 3088716	, ,	f the 'CAN ID' set of	195	29	UINT
	State		Value			
	EXTENDED		1			
	STANDARD		0			
RC_ADCS_MTQ_2_BDOT_X_AVG	Average X BDOT com	mand		224	8	INT
RC_ADCS_MTQ_2_BDOT_X_MAX	Max X BDOT commar	nd		232	8	INT
RC_ADCS_MTQ_2_BDOT_X_MIN	Min X BDOT comman	Min X BDOT command			8	INT
RC_ADCS_MTQ_2_BDOT_Y_AVG	Average Y BDOT com	Average Y BDOT command			8	INT
RC_ADCS_MTQ_2_BDOT_Y_MAX	Max Y BDOT commar	lax Y BDOT command			8	INT
RC_ADCS_MTQ_2_BDOT_Y_MIN	Min Y BDOT comman	d		264	8	INT
RC_ADCS_MTQ_2_BDOT_Z_AVG	Average Z BDOT com	mand		272	8	INT



280

8

INT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ad Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:						
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	SMOS Received Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	OSMOS packet received count			DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAllower 4 bytes of the t	N message, in microseconds. This is the imestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAl upper 4 bytes of the	N message, in microseconds. This is the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fr	rom the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	e message is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or exheaders. Id Value: 3088716	tended) portion of the 'CAN ID' set of	195	29	UINT		



State Value **EXTENDED** 1 0 STANDARD 224 8 INT 232 8 INT $\label{eq:rc_adds} RC_ADCS_MTQ_3_FSW_X_MAX \quad \mbox{ Max X FSW command}$ 240 8 INT RC_ADCS_MTQ_3_FSW_X_MIN Min X FSW command 8 INT 248 Average Y FSW command 256 8 INT RC_ADCS_MTQ_3_FSW_Y_AVG RC_ADCS_MTQ_3_FSW_Y_MAX Max Y FSW command 264 8 INT RC_ADCS_MTQ_3_FSW_Y_MIN Min Y FSW command 272 8 INT 280 8 INT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
DECEMEN TIMEFORMATTER	COCMOC Described Time				DED#/ED		
RECEIVED_TIMEFORMATTED		e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAI	N message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for		16	16	UINT		
	Id Value: 128		32	64			
TAG	NOT USED in current P hardware/software.	T USED in current PCAN-Ethernet Gateway DR rdware/software.			UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the tin	message, in microseconds. This is the nestamp.	96	32	UINT		



DLC Date Length Count from the CAN message. 168 8 UINT	TIMESTAMP_H	Timestamp of the CAN message, in microupper 4 bytes of the timestamp.	roseconds. This is the	128	32	UINT
FLAGS	CHANNEL		ateway DR	160	8	UINT
hardware/software.	DLC	Date Length Count from the CAN mess	sage.	168	8	UINT
CANID_RTR RTR value. 193 1 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. 194 1 UINT CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT State Value EXTENDED 1 1 STANDARD 0 INT INT RC_ADCS_MTQ_4_FSW_Y_MAX Max Z FSW command 224 8 UINT RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT	FLAGS					UINT
CANID_TYPE	CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT
The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT	CANID_RTR	RTR value.		193	1	UINT
headers. Id Value: 308871694 State Value EXTENDED 1 STANDARD 0	CANID_TYPE	_	ndard or extended	194	1	UINT
EXTENDED 1 STANDARD 0 RC_ADCS_MTQ_4_FSW_Y_MAX Max Z FSW command 224 8 UINT RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average Y Duty 256 8 UINT	CANID_ID	headers.	aders.			UINT
STANDARD 0 RC_ADCS_MTQ_4_FSW_Y_MAX Max Z FSW command 224 8 UINT RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT		State	Value			
RC_ADCS_MTQ_4_FSW_Y_MAX Max Z FSW command 224 8 UINT RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT		EXTENDED	1			
RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT		STANDARD	0			
RC_ADCS_MTQ_4_FSW_Z_MIN Min Z FSW command 232 8 UINT RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT						
RC_ADCS_MTQ_4_DUTY_X1_AVG Average X Duty 240 8 UINT RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT	RC_ADCS_MTQ_4_FSW_Y_MAX	Max Z FSW command		224	8	UINT
RC_ADCS_MTQ_4_DUTY_X2_AVG Average X Duty RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 248 8 UINT RC_ADCS_MTQ_4_DUTY_Y1_AVG Average Y Duty 256 8 UINT	RC_ADCS_MTQ_4_FSW_Z_MIN	Min Z FSW command		232	8	UINT
RC_ADCS_MTQ_4_DUTY_Y1_AVG	RC_ADCS_MTQ_4_DUTY_X1_AVG	Average X Duty		240	8	UINT
	RC_ADCS_MTQ_4_DUTY_X2_AVG	Average X Duty		248	8	UINT
RC_ADCS_MTQ_4_DUTY_Y2_AVG	RC_ADCS_MTQ_4_DUTY_Y1_AVG	Average Y Duty		256	8	UINT
	RC_ADCS_MTQ_4_DUTY_Y2_AVG	Average Y Duty		264	8	UINT
RC_ADCS_MTQ_4_DUTY_Z1_AVG	RC_ADCS_MTQ_4_DUTY_Z1_AVG	Average Z Duty		272	8	UINT
RC_ADCS_MTQ_4_DUTY_Z2_AVG						

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	IOS Packet Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	MOS Packet Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					



RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)			0	0	DERIVED
RECEIVED_THEFORE WITTED	Read Conversion:		FormattedConversion		Ü	DEMIVED
	Redu Conversion.	Received Times	offilatted Coffy Cl3601			
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED
	Read Conversion:	ReceivedC	CountConversion			
LENGTH	Length of TCP-ized C	AN message (al	ways 36/0x24 bytes)	0	16	UINT
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN		16	16	UINT
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				UINT
TIMESTAMP_L		Fimestamp of the CAN message, in microseconds. This is the ower 4 bytes of the timestamp.				UINT
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				UINT
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR				UINT
DLC	Date Length Count fi	rom the CAN me	essage.	168	8	UINT
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	176	16	UINT
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT
CANID_RTR	RTR value.			193	1	UINT
CANID_TYPE	Indicates whether the frame.	e message is a st	candard or extended	194	1	UINT
CANID_ID	The ID (normal or exheaders. Id Value: 3088716		of the 'CAN ID' set of	195	29	UINT
	State		Value			
	EXTENDED		1			
	STANDARD		0			
	F. I. C. C			22.4		
RC_ADCS_MTQ_5_FSW_IGNORE	Flight Software Ignor			224	8	UINT
	State FALSE	Valu	e			
		0				
	INOL	TRUE 1				
RC_ADCS_MTQ_5_RESET_COUNTS	Number of resets			232	8	UINT
RC_ADCS_MTQ_5_CMDS_X_VAR	Variance in BDot's dip	oole commands		240	16	UINT
RC_ADCS_MTQ_5_CMDS_Y_VAR	Variance in BDot's dip	oole commands		256	16	UINT
RC_ADCS_MTQ_5_CMDS_Z_VAR	Variance in BDot's dip	ole commands		272	16	UINT



Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (U	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: P	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: Re	eceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received	d count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for (Id Value: 128	CAN	16	16	UINT		
TAG	NOT USED in current PC hardware/software.	CAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN m lower 4 bytes of the time	nessage, in microseconds. This is the estamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN mupper 4 bytes of the tim	nessage, in microseconds. This is the estamp.	128	32	UINT		
CHANNEL	NOT USED in current PC hardware/software.	CAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count from	n the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PC hardware/software.	CAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserve	ed.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the me	essage is a standard or extended	194	1	UINT		
CANID_ID	The ID (normal or extended headers. Id Value: 308871774	ded) portion of the 'CAN ID' set of	195	29	UINT		



atellite Lab									
	State		Value						
	EXTENDED		1						
	STANDARD		0						
RC_ADCS_MTQ_H1_TEMP_MIN	Temperature of MSP				224	16	INT	С	
	Read Conversion:	value / 100.0							
	Limits [DEFAULT]:	RL/15.0 YL/20.	0 YH/30.0 RH/	/35.0					
	Limits Response: Slacklimitresponse								
RC_ADCS_MTQ_H1_TEMP_MAX	Temperature of MSP				240	16	INT	С	
	Read Conversion:	value / 100.0							
	Limits [DEFAULT]:	RL/15.0 YL/20.	0 YH/30.0 RH/	/35.0					
	Limits Response:	Slacklimitrespon	nse						
RC_ADCS_MTQ_H1_TEMP_AVG	Temperature of MSP				256	16	INT	С	
	Read Conversion:	value / 100.0							
	Limits [DEFAULT]:	RL/15.0 YL/20.0 YH/30.0 RH/35.0							
		Limits Response: Slacklimitresponse							
	Limits Response:								
DC ADCC MTO U1 CVCDCTIV	·				272	0	LIDIT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset				272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State	Slacklimitrespon		Value	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE	Slacklimitrespon		Value 0	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT	Slacklimitrespon		Value 0 2	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST	Slacklimitrespon		Value 0 2 6	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAR	Slacklimitrespon		Value 0 2 6	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V	Slacklimitrespon		Value 0 2 6 8 10	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV	Slacklimitrespon	ise	Value 0 2 6 8 10 14	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR	Slacklimitrespon	nse	Value 0 2 6 8 10	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV	Slacklimitrespon ENDING F/NMI KE_UP F/IOLATION SH_EVENT _SOFTWARE_PO ATCHDOG_TIMEO	nse PR DUT	Value 0 2 6 8 10 14 20	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI	Slacklimitrespon Should be should b	nse R DUT TION	Value 0 2 6 8 10 14 20 22	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA	Slacklimitrespon Should be should b	IR DUT TION ATION	Value 0 2 6 8 10 14 20 22 24	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_FRCTLPW_P	Slacklimitrespon Shocklimitrespon Shocklimitre	IR DUT TION ATION	Value 0 2 6 8 10 14 20 22 24 26	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_FRCTLPW_P (PUC)_UNCORRECT	Slacklimitrespon Shoung Shoung Shear She	or R DUT TION ATION _ERR	Value 0 2 6 8 10 14 20 22 24 26 28	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_FRCTLPW_P (PUC)_UNCORRECT (PUC)_PERIPHERAL	Slacklimitrespon Should be should b	or R DUT TION ATION _ERR	Value 0 2 6 8 10 14 20 22 24 26 28 30	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_WDTPW_PA (PUC)_UNCORRECT (PUC)_PERIPHERAL (PUC)_PMMPW_PMI	Slacklimitrespon Shouthing Shouthing Shear Shear Shear Software Softw	or R OUT TION ATION _ERR	Value 0 2 6 8 10 14 20 22 24 26 28 30 32	272	8	UINT		
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_FRCTLPW_P (PUC)_UNCORRECT (PUC)_PERIPHERAL (PUC)_PMMPW_PMI (PUC)_MPUPW_MPI	Slacklimitrespon SNDING SNDING SNDING SNDING SNORD SOFTWARE SOFTWARE SOFTWARE PO ATCHDOG ATCHDOG ATSWORD VIOLATI AREA FETCH M PWD VIOLATI VASSWORD INSE Value 0 2 6 8 10 14 20 22 24 26 28 30 32 34	272	8	UINT				
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SECURITY_V (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_FRCTLPW_P (PUC)_UNCORRECT (PUC)_PERIPHERAL (PUC)_PMMPW_PMI (PUC)_MPUPW_MPI (PUC)_CSPW_CS_P	Slacklimitrespon Should be should b	INSE Value 0 2 6 8 10 14 20 22 24 26 28 30 32 34 36	272	8	UINT			
RC_ADCS_MTQ_H1_SYSRSTIV	Reason for reset State NO_INTERRUPT_PE (BOR)_BROWNOUT (BOR)_RSTIFG_RST (BOR)_LPMX.5_WAI (BOR)_SECURITY_V (BOR)_SVSHIFG_SV (POR)_PMMSWPOR (PUC)_WDTIFG_WAI (PUC)_WDTPW_PA (PUC)_UNCORRECT (PUC)_PERIPHERAL (PUC)_PMMPW_PMI (PUC)_MPUPW_MPI (PUC)_MPUPW_MPI (PUC)_CSPW_CS_F (PUC)_MPUSEGIPIFO	Slacklimitrespon Shouthing Shouthing Shear Shea	PR PUT TION ATION ON ATION G	Value 0 2 6 8 10 14 20 22 24 26 28 30 32 34 36 38	272	8	UINT		



	(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL	46			
RC_ADCS_MTQ_H1_RESET_COUNT	Reset Count		280	8	UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	ime (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the t	N message, in microseconds. This is the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	N message, in microseconds. This is the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fi	rom the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	erved.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the frame.	e message is a standard or extended	194	1	UINT		



CANID_ID	The ID (normal or extended) post- headers. Id Value: 308871783	195	29	UINT	
	State	Value			
	EXTENDED	1			
	STANDARD	0			
RC_ADCS_MTQ_H2_CANRXERROR	the MTQ MCP's RX error buffer		224	8	UINT
PADDING	Padded bits for CAN data		232	56	UINT

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	COSMOS Packet Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (U	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Lo	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved c	ount	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN	-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om th	e CAN message.	168	8	UINT		



PADDING

FLAGS	NOT USED in current PCAN-Ethernet Gate hardware/software.	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT
CANID_RTR	RTR value.		193	1	UINT
CANID_TYPE	Indicates whether the message is a standa	ard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or extended) portion of the Id Value: 307823131	ne 'CAN ID' set of headers.	195	29	UINT
	State	Value			
	EXTENDED	1			
	STANDARD	0			

224

UINT

AMSAT RC_ADCS_SP_10

Padded bits for CAN data

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Read Conversion: PacketTimeSecondsConversion						
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loc	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	ne (L	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:		eceivedTimeSecondsConversion	-				
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ived (count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN m	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type fo Id Value: 128	or CA	NN	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		ssage, in microseconds. This is the camp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN	N me	ssage, in microseconds. This is the	128	32	UINT		



	upper 4 bytes of the timestamp.					
CHANNEL	NOT USED in current PCAN-Ethernet Ga hardware/software.	ateway DR	160	8	UINT	
DLC	Date Length Count from the CAN mess	age.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Ga hardware/software.	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.		193	1	UINT	
CANID_TYPE	Indicates whether the message is a stan	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of headers. Id Value: 307823140	the 'CAN ID' set of	195	29	UINT	
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_ADCS_SP_10_MAG1_Y_AVG	Magnetometer 1 Y axis avg Read Conversion:	value * 73	224	16	INT	nT
RC_ADCS_SP_10_MAG1_Z_MIN	Magnetometer 1 Z axis min		240	16	INT	nT
	Read Conversion:	value * 73				
RC_ADCS_SP_10_MAG1_Z_MAX	Magnetometer 1 Z axis max		256	16	INT	nT
	Read Conversion:	value * 73				
RC_ADCS_SP_10_MAG1_Z_AVG	Magnetometer 1 Z axis avg		272	16	INT	nT
	Read Conversion:	value * 73				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (COSMOS Packet Time (UTC, Floating point, Unix epoch)			DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

	Read Conversion:	ReceivedTimeS	GecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zo	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	ormattedConversion				
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized CA	AN message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		roseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		roseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count fro	om the CAN mess	sage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 30782314		f the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_ADCS_SP_11_MAG2_X_MIN	Magnetometer 2 X ax	is min		224	16	INT	nT
	Read Conversion:		value * 73				
RC_ADCS_SP_11_MAG2_X_MAX	Magnetometer 2 X ax	is max		240	16	INT	nT
	Read Conversion:		value * 73				
RC_ADCS_SP_11_MAG2_X_AVG	_	is avg		256	16	INT	nT
	Read Conversion:		value * 73				



RC_ADCS_SP_11_MAG2_Y_MIN Magnetometer 2 Y axis min 272 16 INT nT

Read Conversion: value * 73

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	t PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the	NN message, in microseconds. This is the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	AN message, in microseconds. This is the stimestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count f	rom the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	served.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	e message is a standard or extended frame.	194	1	UINT		



CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 **UINT** Id Value: 307823142 State Value **EXTENDED** 1 **STANDARD** 0 RC_ADCS_SP_12_MAG2_Y_MAX Magnetometer 2 Y axis max 224 16 INT nΤ Read Conversion: value * 73 RC_ADCS_SP_12_MAG2_Y_AVG Magnetometer 2 Y axis avg 240 16 INT nΤ Read Conversion: value * 73 RC_ADCS_SP_12_MAG2_Z_MIN Magnetometer 2 Z axis min 256 16 INT nT Read Conversion: value * 73 272 16 INT nΤ RC_ADCS_SP_12_MAG2_Z_MAX Magnetometer 2 Z axis max

value * 73

AMSAT RC_ADCS_SP_13

Read Conversion:

Description			Bit Offset	Bit Size	Data Type	Units	Format
COSMOS Packet Time	e (UTC	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
Read Conversion:	P	acketTimeSecondsConversion					
COSMOS Packet Time	(Loc	al time zone, Formatted string)	0	0	DERIVED		
Read Conversion:	Pa	cketTimeFormattedConversion					
COSMOS Received Tin	ne (U	ITC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
Read Conversion:	Re	eceivedTimeSecondsConversion					
COSMOS Received Tim	ne (L	ocal time zone, Formatted string)	0	0	DERIVED		
Read Conversion:	Rec	ceivedTimeFormattedConversion					
COSMOS packet receiv	ived o	count	0	0	DERIVED		
Read Conversion:		ReceivedCountConversion					
	COSMOS Packet Time Read Conversion: COSMOS Packet Time Read Conversion: COSMOS Received Time Read Conversion: COSMOS Received Time Read Conversion:	COSMOS Packet Time (UTO Read Conversion: P COSMOS Packet Time (Loc Read Conversion: Pa COSMOS Received Time (L Read Conversion: Re COSMOS Received Time (L Read Conversion: Re COSMOS Received Time (L Read Conversion: Rec	COSMOS Packet Time (UTC, Floating point, Unix epoch) Read Conversion: PacketTimeSecondsConversion COSMOS Packet Time (Local time zone, Formatted string) Read Conversion: PacketTimeFormattedConversion COSMOS Received Time (UTC, Floating point, Unix epoch) Read Conversion: ReceivedTimeSecondsConversion COSMOS Received Time (Local time zone, Formatted string) Read Conversion: ReceivedTimeFormattedConversion COSMOS packet received count	Description Offset COSMOS Packet Time (UTC, Floating point, Unix epoch) 0 Read Conversion: PacketTimeSecondsConversion COSMOS Packet Time (Local time zone, Formatted string) 0 Read Conversion: PacketTimeFormattedConversion COSMOS Received Time (UTC, Floating point, Unix epoch) 0 Read Conversion: ReceivedTimeSecondsConversion COSMOS Received Time (Local time zone, Formatted string) 0 Read Conversion: ReceivedTimeFormattedConversion COSMOS packet received count 0	Description Offset Size COSMOS Packet Time (UTC, Floating point, Unix epoch) 0 0 Read Conversion: PacketTimeSecondsConversion 0 0 COSMOS Packet Time (Local time zone, Formatted string) 0 0 Read Conversion: PacketTimeFormattedConversion 0 0 Read Conversion: ReceivedTimeSecondsConversion 0 0 COSMOS Received Time (Local time zone, Formatted string) 0 0 Read Conversion: ReceivedTimeFormattedConversion 0 0	Description Offset Size Type COSMOS Packet Time (UTC, Floating point, Unix epoch) 0 0 DERIVED Read Conversion: PacketTimeSecondsConversion 0 0 DERIVED COSMOS Packet Time (Local time zone, Formatted string) 0 0 DERIVED Read Conversion: PacketTimeFormattedConversion 0 0 DERIVED Read Conversion: ReceivedTimeSecondsConversion 0 0 DERIVED COSMOS Received Time (Local time zone, Formatted string) 0 0 DERIVED Read Conversion: ReceivedTimeFormattedConversion 0 0 DERIVED COSMOS packet received count 0 0 DERIVED	Description Offset Size Type Units COSMOS Packet Time (UTC, Floating point, Unix epoch) 0 0 DERIVED Read Conversion: PacketTimeSecondsConversion 0 0 DERIVED COSMOS Packet Time (Local time zone, Formatted string) 0 0 DERIVED Read Conversion: PacketTimeFormattedConversion 0 DERIVED COSMOS Received Time (UTC, Floating point, Unix epoch) 0 0 DERIVED Read Conversion: ReceivedTimeSecondsConversion 0 DERIVED Read Conversion: ReceivedTimeFormattedConversion 0 DERIVED



LENGTH	Length of TCP-ized CAN messa	ge (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	16	UINT	
TAG	NOT USED in current PCAN-Eth hardware/software.	nernet Ga	teway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN message lower 4 bytes of the timestamp		oseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN messagupper 4 bytes of the timestam		oseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current PCAN-Eth hardware/software.	nernet Ga	teway DR	160	8	UINT	
DLC	Date Length Count from the C	AN messa	age.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Eth hardware/software.	nernet Ga	teway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.	R value.		193	1	UINT	
CANID_TYPE	Indicates whether the message	dicates whether the message is a standard or extended frame.		194	1	UINT	
CANID_ID	The ID (normal or extended) p headers. Id Value: 307823143			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD STANDARD		0				
RC_ADCS_SP_13_MAG2_Z_AVG				224	16	INT	nT
RC_ADCS_SP_13_MAG2_Z_AVG	STANDARD			224	16	INT	nT
RC_ADCS_SP_13_MAG2_Z_AVG RC_ADCS_SP_13_SUNA_MIN	STANDARD Magnetometer 2 Z axis avg	sun senso	0 value * 73	224	16	INT	nT deg
	STANDARD Magnetometer 2 Z axis avg Read Conversion:		0 value * 73				
	Magnetometer 2 Z axis avg Read Conversion: Minimum alpha value from the	value *	value * 73 or 60.0/32767				
RC_ADCS_SP_13_SUNA_MIN	STANDARD Magnetometer 2 Z axis avg Read Conversion: Minimum alpha value from the second conversion:	value *	value * 73 or 60.0/32767	240	16	INT	deg
RC_ADCS_SP_13_SUNA_MIN	Magnetometer 2 Z axis avg Read Conversion: Minimum alpha value from the second Conversion: Maximum alpha value from the second Conversion:	value *	value * 73 or 60.0/32767 or 60.0/32767	240	16	INT	deg

		Bit	Bit	Data		
Item Name	Description	Offset	Size	Туре	Units	Format

tellite Lab								
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floatin	ng point,	Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	PacketTin	meSecon	dsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time 7	one For	matted string)	0	0	DERIVED	
THERET_THE ON WITED	Read Conversion:			ttedConversion	Ü	Ü	DERIVED	
	Read Conversion.	r acket iiii	iei oimac	tedconversion				
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Float	ating poin	it, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedT	ГimeSeco	ndsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time	e zone. F	ormatted string)	0	0	DERIVED	
	Read Conversion:			attedConversion				
	Read Conversion.	Received III	inci omic	actedConversion				
RECEIVED_COUNT	COSMOS packet recei	ved count			0	0	DERIVED	
	Read Conversion:	Receive	edCount	:Conversion				
		P-ized CAN message (always 36/0x24 bytes)						
LENGTH	Length of TCP-ized CA	AN message (a	always 30	6/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	message type for CAN alue: 128				16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Etherne	et Gatew	ay DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		microsed	conds. This is the lower	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		microsec	conds. This is the upper	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Etherne	et Gatew	ay DR	160	8	UINT	
DLC	Date Length Count fro	om the CAN n	nessage.		168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Etherne	et Gatew	ay DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	rved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	message is a	standard	d or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended Id Value: 30782314	tes whether the message is a standard or extended frame. (normal or extended) portion of the 'CAN ID' set of headers lue: 307823144			195	29	UINT	
	State	Value						
	EXTENDED		1	1				
	STANDARD		()				
DC ADCS SD 14 CUIND MIN	Minimum hota valva fr	om the sun o	consor		224	16	TNIT	dog
RC_ADCS_SP_14_SUNB_MIN	Minimum beta value fr			0/22767	224	16	INT	deg
	Read Conversion:	va	alue * 60	.0/32767				



RC_ADCS_SP_14_SUNB_MAX	DCS_SP_14_SUNB_MAX Maximum beta value from the sun sensor		240	16	INT	deg
	Read Conversion:	value * 60.0/32767				
RC_ADCS_SP_14_SUNB_AVG	Average beta value from the su	n sensor	256	16	INT	deg
	Read Conversion:	value * 60.0/32767				
RC_ADCS_SP_14_SUN_VALID	Sum of last 255 processed sun	sensor valid bits	272	8	UINT	
PADDING	Padded bits for CAN data	led bits for CAN data		8	UINT	

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	F	racketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loc	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	ncketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ne (U	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ived o	count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN m	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CA	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	I-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		ssage, in microseconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timesta		ssage, in microseconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN	I-Ethernet Gateway DR	160	8	UINT		



DLC	Date Length Count from the CAN	messag	je.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ether hardware/software.	net Gat	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the message is	a stand	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) port headers. Id Value: 307823145			195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_ADCS_SP_15_IMU_VALID	Sum of last 255 processed imu va	alid bits		224	8	UINT		
RC_ADCS_SP_15_IMU_X_MIN	IMU X axis min			232	16	INT	deg/s	%0.2f
	Read Conversion:	value [*]	0.004375					
RC_ADCS_SP_15_IMU_X_MAX	IMU X axis max			248	16	INT	deg/s	%0.2f
	Read Conversion:	value ³	0.004375					
RC_ADCS_SP_15_IMU_X_AVG	IMU X axis avg			264	16	INT	deg/s	%0.2f
	Read Conversion:	value *	0.004375					
PADDING	Padded bits for CAN data			280	8	UINT		

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (I	UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (I	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone, Formatted string)	0	0	DERIVED		

	Read Conversion: Receive	edTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet received counting Read Conversion:		intConversion	0	0	DERIVED		
LENGTH	Length of TCP-ized CAN messag	ge (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	16	UINT		
TAG	NOT USED in current PCAN-Eth hardware/software.	nernet Gat	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message 4 bytes of the timestamp.	e, in micro	seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message 4 bytes of the timestamp.	e, in micro	seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Eth hardware/software.	nernet Gat	eway DR	160	8	UINT		
DLC	Date Length Count from the CA	AN messag	je.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Eth hardware/software.	nernet Gat	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the message	is a stand	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) po headers. Id Value: 307823146	ortion of tl	he 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_ADCS_SP_16_IMU_Y_MIN	IMU Y axis min			224	16	INT	deg/s	%0.2f
	Read Conversion:	value ³	* 0.004375					
RC_ADCS_SP_16_IMU_Y_MAX	IMU Y axis max			240	16	INT	deg/s	%0.2f
	Read Conversion:	value ³	* 0.004375					
RC_ADCS_SP_16_IMU_Y_AVG	IMU Y axis avg			256	16	INT	deg/s	%0.2f
	Read Conversion:	value ³	¢ 0.004375					
RC_ADCS_SP_16_IMU_Z_MIN	IMU Z axis min			272	16	INT	deg/s	%0.2f
	Read Conversion:	value ³	* 0.004375					



Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T string)	ime (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rec	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized (CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in curren hardware/software.	t PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the C/the lower 4 bytes of	AN message, in microseconds. This is the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the C/the upper 4 bytes of	AN message, in microseconds. This is f the timestamp.	128	32	UINT		
CHANNEL	NOT USED in curren hardware/software.	t PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count	from the CAN message.	168	8	UINT		
FLAGS	NOT USED in curren hardware/software.	t PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	served.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether th frame.	ne message is a standard or extended	194	1	UINT		
CANID_ID	The ID (normal or exheaders.	ctended) portion of the 'CAN ID' set of	195	29	UINT		



	Id Value: 307823147							
	State	Va	ue					
	EXTENDED	1						
	STANDARD	0						
RC_ADCS_SP_17_IMU_Z_MAX	IMU Z axis max			224	16	INT	deg/s	%0.2
	Read Conversion:	value * 0.0	004375					
RC_ADCS_SP_17_IMU_Z_AVG	IMU Z axis avg			240	16	INT	dea/s	%0.2
		value * 0.0	10/1375					
	Read Conversion:	value " 0.0	104373					
RC_ADCS_SP_17_I2C_RESULT_MAG	_1 None			256	8	UINT		
	State		Value		256 8 UINT 264 8 UINT			
	NO_ERROR		0		8 UINT			
	START_TIMEOUT		1	256 8 UINT				
	STOP_TIMEOUT		2	240 16 INT 256 8 UINT				
	NACK	Value						
	TRANSMIT_TIMEOUT		4					
RC_ADCS_SP_17_I2C_RESULT_MAG	_2 None	TIMEOUT 2 3 SMIT_TIMEOUT 4 Value			8	UINT		
	State		Value					
	NO_ERROR		0			16 INT deg/s 8 UINT 8 UINT		
	START_TIMEOUT		1					
	STOP_TIMEOUT		2					
	NACK		3					
	TRANSMIT_TIMEOUT		4		8 UINT 8 UINT			
RC_ADCS_SP_17_I2C_RESULT_IMU	None			272	8	UINT		
	State		Value		264 8 UINT			
	NO_ERROR		0					
	START_TIMEOUT		1					
	STOP_TIMEOUT		2					
	NACK		3					
	TRANSMIT_TIMEOUT		4					
	TRANSMIT_TIMEOUT		4					
RC_ADCS_SP_17_I2C_RESULT_SUN			4	280	8	UINT		

0

NO_ERROR

START_TIMEOUT



STOP_TIMEOUT	2
NACK	3
TRANSMIT_TIMEOUT	4

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	/ED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.		32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.		32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		8	UINT		
DLC	Date Length Count from the CAN message.		8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT		
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.	194	1	UINT		



CANID_ID 195 UINT The ID (normal or extended) portion of the 'CAN ID' set of 29 headers. Id Value: 307823132 State Value **EXTENDED** 1 0 **STANDARD** RC_ADCS_SP_2_IMUP_X_MIN Processed IMU X axis min 224 16 INT %0.2f deg/s Read Conversion: value * 0.004375 RC_ADCS_SP_2_IMUP_X_MAX Processed IMU X axis max 240 16 INT deg/s %0.2f Read Conversion: value * 0.004375 RC_ADCS_SP_2_IMUP_X_AVG Processed IMU X axis avg 256 16 INT deg/s %0.2f value * 0.004375 Read Conversion: 272 16 INT RC_ADCS_SP_2_IMUP_Y_MIN Processed IMU Y axis min deg/s %0.2f Read Conversion: value * 0.004375

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					



enite Lab								
LENGTH	Length of TCP-ized CAN message	e (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	16	UINT		
TAG	NOT USED in current PCAN-Ethe hardware/software.	rnet Gate	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, 4 bytes of the timestamp.	in micros	seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, 4 bytes of the timestamp.	in micros	seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethe hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				UINT		
DLC	Date Length Count from the CAN	N messaç	ge.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethe hardware/software.	176	16	UINT				
CANID_PADDING	Fixed value of 0 - reserved.	red value of 0 - reserved.		192	1	UINT		
CANID_RTR	RTR value.	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the message is	a stand	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) por headers. Id Value: 307823133	tion of th	he 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_ADCS_SP_3_IMUP_Y_MAX	Processed IMU Y axis max			224	16	INT	deg/s	%0.2f
	Read Conversion:	value *	* 0.004375					
RC_ADCS_SP_3_IMUP_Y_AVG	Processed IMU Y axis avg			240	16	INT	deg/s	%0.2f
	Read Conversion:	value *	* 0.004375					
RC_ADCS_SP_3_IMUP_Z_MIN	Processed IMU Z axis min			256	16	INT	deg/s	%0.2f
	Read Conversion:	value *	* 0.004375					
RC_ADCS_SP_3_IMUP_Z_MAX	Processed IMU Z axis max			272	16	INT	deg/s	%0.2f
		d Conversion: value * 0.004375						

		DIL	DIL	Data		
Item Name	Description	Offset	Size	Type	Units	Format

atellite Lab								
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating poin	t, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
DACKET TIMEFORMATTED	COCMOC Dacket Time	(Local time zone E	ormattad string)	0	0	DEDIVED		
PACKET_TIMEFORMATTED	COSMOS Packet Time			0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floating po	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zone	0	0	DERIVED			
	Read Conversion:	ReceivedTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED			
	Read Conversion:							
LENGTH	Length of TCP-ized C	AN message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAC		DCAN Ethorast Cot	every DD	22	C 1	LIMIT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAI 4 bytes of the timesta		seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAI 4 bytes of the timesta		seconds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	160	8	UINT		
DLC	Date Length Count fr	om the CAN messag	ge.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a stand	ard or extended frame.	194	1	UINT		
CANID_ID	headers.	The ID (normal or extended) portion of the 'CAN ID' set of				UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_ADCS_SP_4_IMUP_Z_AVG	Processed IMU Z axis	avg		224	16	INT	deg/s	%0.2f



Read Conversion: value * 0.004375 Sun Sensor X axis min 240 16 RC_ADCS_SP_4_SUN_X_MIN INT u %0.4f Read Conversion: value * 3.051757e-5 RC_ADCS_SP_4_SUN_X_MAX Sun Sensor X axis max 256 16 INT u %0.4f Read Conversion: value * 3.051757e-5 Sun Sensor X axis avg 272 RC_ADCS_SP_4_SUN_X_AVG 16 INT %0.4f Read Conversion: value * 3.051757e-5

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (U	TC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Lo	ocal time zone, Formatted string)	0 0 DERIVED				
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received	l count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN I	message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for C	CAN	16	16	UINT		
TAG	NOT USED in current PC/ hardware/software.	AN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN m 4 bytes of the timestamp	essage, in microseconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN m 4 bytes of the timestamp	essage, in microseconds. This is the upper	128	32	UINT		



CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 8 **UINT** hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** UINT NOT USED in current PCAN-Ethernet Gateway DR 176 16 hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 UINT CANID_TYPE UINT Indicates whether the message is a standard or extended frame. 194 1 CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT Id Value: 307823135 State Value **EXTENDED** 1 0 **STANDARD** RC_ADCS_SP_5_SUN_Y_MIN Sun Sensor Y axis min 224 16 INT u %0.4f value * 3.051757e-5 Read Conversion: 240 %0.4f RC_ADCS_SP_5_SUN_Y_MAX Sun Sensor Y axis max 16 INT u Read Conversion: value * 3.051757e-5

value * 3.051757e-5

value * 3.051757e-5

256

272

16

16

INT

INT

u

u

%0.4f

%0.4f

AMSAT RC_ADCS_SP_6

Sun Sensor Y axis avg

Read Conversion:

Sun Sensor Z axis min

Read Conversion:

RC_ADCS_SP_5_SUN_Y_AVG

RC_ADCS_SP_5_SUN_Z_MIN

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	OSMOS Received Time (UTC, Floating point, Unix epoch)		0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					

RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)			0	0	DERIVED			
	Read Conversion:	Recei	vedTimeFor	mattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived cou	ınt		0	0	DERIVED		
	Read Conversion:	R	teceivedCou	ntConversion					
LENGTH	Length of TCP-ized C	CAN mess	age (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f Id Value: 128	for CAN			16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				32	64	UINT		
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower bytes of the timestamp.				32	UINT		
TIMESTAMP_H		imestamp of the CAN message, in microseconds. This is the upper bytes of the timestamp.				32	UINT		
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR				8	UINT		
DLC	Date Length Count fi	Date Length Count from the CAN message.				8	UINT		
FLAGS	NOT USED in current hardware/software.	: PCAN-E	thernet Gate	eway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT		
CANID_RTR	RTR value.				193	1	UINT		
CANID_TYPE	Indicates whether the	e messag	je is a standa	ard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or ex headers. Id Value: 3078231		portion of th	ne 'CAN ID' set of	195	29	UINT		
	State			Value					
	EXTENDED			1					
	STANDARD			0					
RC_ADCS_SP_6_SUN_Z_MAX	Sun Sensor Z axis ma	ах			224	16	INT	u	%0.4f
	Read Conversion:		value * 3	.051757e-5					
RC_ADCS_SP_6_SUN_Z_AVG	Sun Sensor Z axis av	g			240	16	INT	u	%0.4f
	Read Conversion:		value * 3	.051757e-5					
RC_ADCS_SP_6_MAG1_VALID	Sum of last 255 proc	essed ma	ag valid bits		256	8	UINT		
RC_ADCS_SP_6_MAG2_VALID	Sum of last 255 processed mag valid bits		264	8	UINT				
RC_ADCS_SP_6_MAG1_X_MIN	Magnetometer 1 X ax	kis min			272	16	INT	nT	
	Read Conversion:			value * 73					



Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	MOS Received Time (Local time zone, Formatted string)		0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	NN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta	I message, in microseconds. This is the mp.	lower 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t	I message, in microseconds. This is the imestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the	message is a standard or extended fran	ne. 194	1	UINT		
CANID_ID	The ID (normal or ext headers. Id Value: 30782313	ended) portion of the 'CAN ID' set of	195	29	UINT		



State	Value			
EXTENDED	1			
STANDARD	0			
None		224	16	UINT
None		240	16	UINT
None		256	16	UINT
Padded bits for CAN data		272	16	UINT
	EXTENDED STANDARD None None None	EXTENDED 1 STANDARD 0 None None None	EXTENDED 1 STANDARD 0 None 224 None 240 None 256	EXTENDED 1 STANDARD 0 None 224 16 None 240 16 None 256 16

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	racketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Loc	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	MOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:							
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	me (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ived o	count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN m	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CA	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		ssage, in microseconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		ssage, in microseconds. This is the tamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	om th	ne CAN message.	168	8	UINT		



FLAGS NOT USED in current PCAN-Ethernet Gateway DR 176 16 **UINT** hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. 194 1 UINT CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 UINT headers. Id Value: 307823138 State Value **EXTENDED** 1 **STANDARD** 0 224 UINT RC_ADCS_SP_8_MAG2_VAR_X None 16 240 **UINT** RC_ADCS_SP_8_MAG2_VAR_Y None 16 RC_ADCS_SP_8_MAG2_VAR_Z None 256 16 UINT PADDING Padded bits for CAN data 272 16 UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	MOS Packet Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Pacaivad Tim	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
RECEIVED_111/1ESECONDS	Read Conversion:	ReceivedTimeSecondsConversion	O .	U	DENIVED		700.01
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	red count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	Length of TCP-ized CAN message (always 36/0x24 bytes)		16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	r CAN	16	16	UINT		



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TAG	NOT USED in current PCAN-Ethernet Garhardware/software.	teway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in micro 4 bytes of the timestamp.	oseconds. This is the lower	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in micro upper 4 bytes of the timestamp.	oseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet Gar hardware/software.	teway DR	160	8	UINT	
DLC	Date Length Count from the CAN messa	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Garhardware/software.	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.					
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a stand	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823139			29	UINT	
	Id Value: 307823139					
	Id Value: 307823139 State	Value				
		Value				
	State					
RC_ADCS_SP_9_MAG1_X_MAX	State EXTENDED	1	224	16	INT	nT
RC_ADCS_SP_9_MAG1_X_MAX	State EXTENDED STANDARD	1	224	16	INT	nT
RC_ADCS_SP_9_MAG1_X_MAX	State EXTENDED STANDARD Magnetometer 1 X axis max	1 0	224	16	INT	nT
	State EXTENDED STANDARD Magnetometer 1 X axis max	1 0	224	16	INT	nT nT
	State EXTENDED STANDARD Magnetometer 1 X axis max Read Conversion:	1 0				
RC_ADCS_SP_9_MAG1_X_MAX RC_ADCS_SP_9_MAG1_X_AVG RC_ADCS_SP_9_MAG1_Y_MIN	State EXTENDED STANDARD Magnetometer 1 X axis max Read Conversion: Magnetometer 1 X axis avg	1 0 value * 73				
RC_ADCS_SP_9_MAG1_X_AVG	State EXTENDED STANDARD Magnetometer 1 X axis max Read Conversion: Magnetometer 1 X axis avg Read Conversion:	1 0 value * 73	240	16	INT	nT
RC_ADCS_SP_9_MAG1_X_AVG	State EXTENDED STANDARD Magnetometer 1 X axis max Read Conversion: Magnetometer 1 X axis avg Read Conversion: Magnetometer 1 Y axis min Read Conversion:	1 0 value * 73 value * 73	240	16	INT	nT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					

PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone,	, Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeFor	mattedConversion				
		() TO T					040.55
RECEIVED_TIMESECONDS	COSMOS Received Tir			0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zoi	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	ormattedConversion				
RECEIVED_COUNT	COSMOS packet rece	ived count		0	0	DERIVED	
	Read Conversion:		untConversion				
LENGTH	Length of TCP-ized Ca	AN message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128				UINT	
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				UINT	
TIMESTAMP_H	Timestamp of the CAI upper 4 bytes of the		roseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN mess	sage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 3088717		f the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
DC ADCC CD III TTITLE	T 1 6167			22.1		TA 177	6
RC_ADCS_SP_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
		Read Conversion: value / 100.0 Limits [DEFAULT]: RL/15.0 YL/20.0 YH/30.0 RH/35.0					
	Limits [DEFAULT]: Limits Response:	Slacklimitrespor					



RC_ADCS_SP_H1_TEMP_MAX	Temperature of MSP	240	16	INT	С	
	Read Conversion:	value / 100.0				
	Limits [DEFAULT]:	RL/15.0 YL/20.0 YH/30.0 RH/35.0				
Limits Response: Slacklimitresponse		Slacklimitresponse				
RC_ADCS_SP_H1_TEMP_AVG	Temperature of MSP		256	16	INT	С
RC_ADCS_SP_H1_TEMP_AVG	Temperature of MSP	value / 100.0	256	16	INT	С
RC_ADCS_SP_H1_TEMP_AVG		value / 100.0 RL/15.0 YL/20.0 YH/30.0 RH/35.0	256	16	INT	С
RC_ADCS_SP_H1_TEMP_AVG		value / 100.0	256	16	INT	С

272

UINT

RC_ADCS_SP_H1_SYSRSTIV

Reason for reset

State	Value
NO_INTERRUPT_PENDING	0
(BOR)_BROWNOUT	2
(BOR)_RSTIFG_RST/NMI	6
(BOR)_LPMX.5_WAKE_UP	8
(BOR)_SECURITY_VIOLATION	10
(BOR)_SVSHIFG_SVSH_EVENT	14
(POR)_PMMSWPOR_SOFTWARE_POR	20
(PUC)_WDTIFG_WATCHDOG_TIMEOUT	22
(PUC)_WDTPW_PASSWORD_VIOLATION	24
(PUC)_FRCTLPW_PASSWORD_VIOLATION	26
(PUC)_UNCORRECTABLE_FRAM_BIT_ERR	28
(PUC)_PERIPHERAL_AREA_FETCH	30
(PUC)_PMMPW_PMM_PWD_VIOLATION	32
(PUC)_MPUPW_MPU_PWD_VIOLATION	34
(PUC)_CSPW_CS_PASSWORD_VIOLATION	36
(PUC)_MPUSEGIPIFGENCAPIPMEMSEG	38
(PUC)_MPUSEGIIFGINFOMEMSEGVIOL	40
(PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL	42
(PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL	44
(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL	46

RC_ADCS_SP_H1_RESET_COUNT Reset Count 280 8 UINT

Item Name	Description	Bit Offset	Bit Size	Data Type	Units I	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

atellite Lab							
	Read Conversion:	PacketTimeSe	condsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeForm	mattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Ti	ime (UTC, Floating	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	ime (Local time zor	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet rece	eived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	CAN message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f Id Value: 128	Fixed message type for CAN Id Value: 128				UINT	
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.				UINT	
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		roseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		roseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	: PCAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count f	rom the CAN mess	age.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ex headers. Id Value: 3088717		the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD						
RC_ADCS_SP_H2_CANRXERROR	SP MCP's RX error bu	ıffer		224	8	UINT	
PADDING	Padded bits for CAN	data		232	56	UINT	



Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string	g) 0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion	n				
RECEIVED_COUNT	COSMOS packet received count	0	0 0 DERIVED			
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is t lower 4 bytes of the timestamp.	ne 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is t upper 4 bytes of the timestamp.	ne 128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT		
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 309920256	195	29	UINT		
	State Value					



	EXTENDED 1 STANDARD 0					
RC_EPS_BATT_1_ACC_CHARGE_AVG	None	one			UINT	
RC_EPS_BATT_1_VOLTAGE_AVG	None		240	16	UINT	V
	Read Conversion:					

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0 0 DERIVED			%0.6f	
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone, Formatted string)	0 0 DERIVED				
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	EIVED_COUNT COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAI lower 4 bytes of the t	N message, in microseconds. This is the important cimestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAI upper 4 bytes of the	N message, in microseconds. This is the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fr	rom the CAN message.	168	8	UINT		



FLAGS	NOT USED in current F hardware/software.	PCAN-Ethernet	Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reser	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a si	tandard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended in the idea of		of the 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_EPS_BATT_2_NODE_V_MIN	Voltage at the node be	etween batterie	value * 0.004	224	16	UINT	V	%.4f
RC_EPS_BATT_2_NODE_V_MAX	Voltage at the node be	etween batterie		240	16	UINT	V	%.4f
	Read Conversion:		value * 0.004			0211	·	
RC_EPS_BATT_2_NODE_V_AVG	Voltage at the node be	etween batterie	es	256	16	UINT	V	%.4f
	Read Conversion:	value * 0.00	04					
	Limits [DEFAULT]:	RL/2.6 YL/2	2.9 YH/3.65 RH/3.85					
	Limits Response:	Limits Response: Slacklimitresponse						
PADDING	Padded bits for CAN da	ata		272	16	UINT		

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0 DERIVED			
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	COSMOS Received Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					

RECEIVED_COUNT	COSMOS packet rece	ived (count		0	0	DERIVED		
	Read Conversion:		ReceivedCo	untConversion					
LENGTH	Length of TCP-ized C	AN m	essage (alwa	nys 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CA	ΔN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCA	N-Ethernet G	Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAI lower 4 bytes of the t			roseconds. This is the	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAI upper 4 bytes of the			roseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCA	N-Ethernet G	Sateway DR	160	8	UINT		
DLC	Date Length Count fr	om t	he CAN mes	sage.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	T USED in current PCAN-Ethernet Gateway DR dware/software.				16	UINT		
CANID_PADDING	Fixed value of 0 - rese	ed value of 0 - reserved.				1	UINT		
CANID_RTR	RTR value.	RTR value.				1	UINT		
CANID_TYPE	Indicates whether the frame.	Indicates whether the message is a standard or extended frame.				1	UINT		
CANID_ID	The ID (normal or ext headers. Id Value: 3088716		ed) portion o	f the 'CAN ID' set of	195	29	UINT		
	State Value								
	EXTENDED			1					
	STANDARD			0					
RC_EPS_BATT_3_CURRENT_MIN	Minimum battery curr	ent s	een since las	t min/max reset	224	16	UINT	A	%.41
NG_EI	Read Conversion:	Cite		767) / 3276.7		10	0111	,,	7011
	Redu Conversion.		(Value 32	707) 3270.7					
RC_EPS_BATT_3_CURRENT_MAX	Maximum battery cur	rent	seen since la	st min/max reset	240	16	UINT	Α	%.4
	Read Conversion:		(value - 32)	767) / 3276.7					
RC_EPS_BATT_3_CURRENT_AVG	Average current into	or ou	it of the batt	ery	256	16	UINT	A	%.4
	Read Conversion:	(va	alue - 32767) / 3276.7					
	Limits [DEFAULT]:	RL	/-10.0 YL/-8	3.0 YH/4.5 RH/6.0					
	Limits Response:								
RC_EPS_BATT_3_BATT_TEMP_AVG	Battery temperature i	indica	ited by TMP	36 mounted to the	272	8	INT	С	
0_ <i>5</i> ,0_ <i>5</i> ,	- secon y compended to			Joountou to the	-/-	0	4141	0	



batteries.

Read Conversion: value - 50

Limits [DEFAULT]: RL/15.0 YL/20.0 YH/30.0 RH/35.0

Limits Response: Slacklimitresponse

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion	sion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		

CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT		
CANID_RTR	RTR value.				193	1	UINT		
CANID_TYPE	Indicates whether the frame.	e messa	ge is a s	tandard or extended	194	1	UINT		
CANID_ID	The ID (normal or exheaders. Id Value: 3078231		portion	of the 'CAN ID' set of	195	29	UINT		
	State			Value					
	EXTENDED			1					
	STANDARD			0					
RC_EPS_BATT_4_VOLTAGE_MIN							UINT	V	%.4f
				,					
RC_EPS_BATT_4_VOLTAGE_MAX	Battery voltage from the coulomb counter on the battery board. Most accurate but only on when the EPS power domain is on.				240	16	UINT	V	%.4f
	Read Conversion:	Read Conversion: 23.6 * value / 65535							
RC_EPS_BATT_4_VOLTAGE_AVG	Battery voltage from board. Most accurate domain is on.			ounter on the battery nen the EPS power	256	16	UINT	V	%.4f
	Read Conversion:	23.6	* value	/ 65535					
	Limits [DEFAULT]:	RL/6.	.0 YL/6.	0 YH/7.3 RH/7.7					
	Limits Response:	Slack	limitresp	oonse					
RC_EPS_BATT_4_BALANCER_STATE	State of the battery to balancer only gives it				272	1	UINT		
	State		Value						
	FALSE		0						
	TRUE		1						
RC_EPS_BATT_4_HEATER_STATE	State of the battery h	neater s	witch		273	1	UINT		
	State		Value						
	FALSE 0								
	TRUE 1								
RC_EPS_BATT_4_HEATER_AUTO_STATE	E None					1	UINT		
	State		Value						
	FALSE		0						



275 1 UINT
276 12 UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type f	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the	N message, in microseconds. This is the imestamp.	96	32	UINT		
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			UINT		
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			UINT		
DLC	Date Length Count fi	rom the CAN message.	168	8	UINT		



FLAGS	NOT USED in current hardware/software.	PCAN-Etherne	et G	ateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT		
CANID_RTR	RTR value.				193	1	UINT		
CANID_TYPE	Indicates whether the frame.	e message is a	star	ndard or extended	194	1	UINT		
CANID_ID	The ID (normal or exheaders. Id Value: 3088716		on of	f the 'CAN ID' set of	195	29	UINT		
	State			Value					
	EXTENDED	EXTENDED 1							
	STANDARD	STANDARD 0							
RC_EPS_BATT_5_NODE_C_MIN	Current into the node between batteries. Indicates battery ballancing state.				224	16	INT	Α	%.4f
	Read Conversion:	,	valu	ie / 327.68					
RC_EPS_BATT_5_NODE_C_MAX	Current into the node ballancing state.	e between batt	terie	es. Indicates battery	240	16	INT	Α	%.4f
	Read Conversion:	,	valu	ne / 327.68					
RC_EPS_BATT_5_NODE_C_AVG	Current into the node ballancing state.	e between batt	terie	es. Indicates battery	256	16	INT	Α	%.4f
	Read Conversion:	value / 327	.68						
	Limits [DEFAULT]:	RL/-10.0 Yl	L/-8	.0 YH/4.5 RH/6.0					
	Limits Response:	Slacklimitres	spor	nse					
RC_EPS_BATT_5_BATT_TEMP_MIN	Battery temperature indicated by TMP36 mounted to the batteries.			272	8	INT	С		
	Read Conversion: value - 50								
RC_EPS_BATT_5_BATT_TEMP_MAX	Battery temperature batteries.	indicated by T	MP3	36 mounted to the	280	8	INT	С	
	Read Conversion:			value - 50	1				

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					

PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeFor	mattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating	point, Unix epoch)	0	0	DERIVED	%0.6
	Read Conversion:	ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zor	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet rece	eived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	AN message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f Id Value: 128	16	16	UINT			
TAG	NOT USED in current hardware/software.	32	64	UINT			
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				32	UINT	
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR				UINT	
DLC	Date Length Count fi	rom the CAN mess	age.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ex headers. Id Value: 3088716		the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
				224	_		
RC_EPS_BATT_6_STATUS	State of charge status register				8	UINT	
RC_EPS_BATT_6_CTRL	State of charge from coulomb counter on battery board				8	UINT	
RC_EPS_BATT_6_LAST_CHARGE	The MET of last full ba	attery charge		240	40	UINT	S
	Read Conversion:	valu	e * 2.0**-8				



PADDING Padded bits for CAN data 280 8 UINT

Item Name	Description				Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Pack	ket Time	UTC, Floating point, U	nix epoch)	0	0	DERIVED		%0.6f
	Read Conver	rsion:	PacketTimeSecond	IsConversion					
PACKET_TIMEFORMATTED	COSMOS Pack	ket Time	Local time zone, Form	atted string)	0	0	DERIVED		
	Read Conver	rsion:	PacketTimeFormatt	edConversion					
RECEIVED_TIMESECONDS	COSMOS Reco	eived Tim	e (UTC, Floating point,	Unix epoch)	0	0	DERIVED		%0.6f
	Read Conver	rsion: ReceivedTimeSecondsConversion							
RECEIVED_TIMEFORMATTED	COSMOS Reco	COSMOS Received Time (Local time zone, Formatted string)				0	DERIVED		
	Read Conver	rsion:	ReceivedTimeForma	ttedConversion					
RECEIVED_COUNT	COSMOS pack	ket receiv	ed count		0	0	DERIVED		
	Read Conver	version: ReceivedCountConversion							
ACC_CHARGE_MIN	Read Conversion:	* 2 ** ("RC_EP	ead('RC_EPS_BATT_7 2 * ((System.telemetr 6_BATT_6", "RC_EPS 1000) >> 3)) * 17 / 2	_BATT_6_CTRL") &	0	0	DERIVED	mAH	
ACC_CHARGE_AVG	Read Conversion:	* 2 ** ("RC_EP	ead('RC_EPS_BATT_7 2 * ((System.telemetr 5_BATT_6", "RC_EPS 1000) >> 3)) * 17 / 2	BATT_6_CTRL") &	0	0	DERIVED	mAH	
ACC_CHARGE_MAX	Read Conversion:	packet.read('RC_EPS_BATT_7_ACC_CHARGE_MAX') * 2 ** (2 * ((System.telemetry.value("AMSAT", "RC_EPS_BATT_6", "RC_EPS_BATT_6_CTRL") & 0b00111000) >> 3)) * 17 / 24576			0	0	DERIVED	mAH	
RC_EPS_BATT_7_VOLTAGE_DIFF	Read Conversion:	"RC_EP "RC_EP System "RC_EP	System.telemetry.val 5_BATT_4", 5_BATT_4_VOLTAGE_ telemetry.value("AMS, 5_BATT_2", 5_BATT_2_NODE_V_,	AVG") - (2 * AT",	0	0	DERIVED	mV	%.4f



Length of TCP-ized CAN message (always 36/0x24 bytes) 0 16 UINT **LENGTH** FIXED_TYPE Fixed message type for CAN 16 16 UINT Id Value: 128 TAG NOT USED in current PCAN-Ethernet Gateway DR 32 UINT 64 hardware/software. TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is the lower 4 96 32 UINT bytes of the timestamp. TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper UINT 128 32 4 bytes of the timestamp. CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 UINT 8 hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** NOT USED in current PCAN-Ethernet Gateway DR 176 UINT 16 hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 1 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. UINT 194 1 CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. 195 29 UINT Id Value: 307823194 State Value **EXTENDED** 1 0 **STANDARD** RC_EPS_BATT_7_ACC_CHARGE_MIN Acumulated charge minimum 224 16 UINT 240 UINT 16 256 16 UINT **PADDING** Padded bits for CAN data 272 16 UINT

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

	Read Conversion:	ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zo	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	ormattedConversion				
RECEIVED_COUNT	COSMOS packet rece			0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized (CAN message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type Id Value: 128	for CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	t PCAN-Ethernet G	Sateway DR	32	64	UINT	
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the	128	32	UINT			
CHANNEL	NOT USED in current hardware/software.	160	8	UINT			
DLC	Date Length Count f	rom the CAN mess	sage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT	
CANID_PADDING	Fixed value of 0 - res	served.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether th frame.	e message is a staı	ndard or extended	194	1	UINT	
CANID_ID	The ID (normal or ex headers. Id Value: 3088712		f the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_BATT_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
	Read Conversion:						
	Limits [DEFAULT]:						
	Limits Response:						
RC_EPS_BATT_H1_TEMP_MAX	Temperature of MSP			240	16	INT	С
	Read Conversion: value / 100.0						
	Limits [DEFAULT]:	RL/15.0 YL/20.	0 YH/30.0 RH/35.0				



	Limits Response:	Slacklimitresponse					
RC_EPS_BATT_H1_TEMP_AVG	Temperature of MSP			256	16	INT	С
	Read Conversion:	Read Conversion: value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.0 YH/30.0 F	RH/35.0				
	Limits Response:	Slacklimitresponse					
RC_EPS_BATT_H1_SYSRSTIV	Reason for reset			272	8	UINT	
	State Value						
	NO_INTERRUPT_PE	0					
	(BOR)_BROWNOUT	2					
	(BOR)_RSTIFG_RST	6					
	(BOR)_LPMX.5_WAKE_UP						
	(BOR)_SECURITY_V	/IOLATION	10				
	(BOR)_SVSHIFG_SV	14					
	(POR)_PMMSWPOR	20					
	(PUC)_WDTIFG_WA	22					
	(PUC)_WDTPW_PA	SSWORD_VIOLATION	24				
	(PUC)_FRCTLPW_P	ASSWORD_VIOLATION	26				
	(PUC)_UNCORRECT	FABLE_FRAM_BIT_ERR	28				
	(PUC)_PERIPHERAL	_AREA_FETCH	30				
	(PUC)_PMMPW_PM	M_PW D_VIOLATION	32				
	(PUC)_MPUPW_MPI	U_PWD_VIOLATION	34				
	(PUC)_CSPW_CS_F	PASSWORD_VIOLATION	36				
	(PUC)_MPUSEGIPIF	GENCAPIPMEMSEG	38				
	(PUC)_MPUSEGIIFG	INFOMEMSEGVIOL	40				
	(PUC)_MPUSEG1IFG	G_SEG_1_MEM_VIOL	42				
	(PUC)_MPUSEG2IFG	G_SEG_2_MEM_VIOL	44				
	(PUC)_MPUSEG3IFG	46					

AMSAT RC_EPS_BATT_H2

RC_EPS_BATT_H1_RESET_COUNT Reset Count

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Pack	ketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local	time zone, Formatted string)	0	0	DERIVED		

280

UINT



	Read Conversion:	PacketTimeFor	mattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeS	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zoi	ne, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	ormattedConversion				
RECEIVED_COUNT	COSMOS packet rece	eived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	Length of TCP-ized CAN message (always 36/0x24 bytes)					
FIXED_TYPE	Fixed message type for CAN Id Value: 128				16	UINT	
TAG	NOT USED in current hardware/software.	32	64	UINT			
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.				32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				32	UINT	
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count f	rom the CAN mess	sage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	served.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or exheaders. Id Value: 3088717		f the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_BATT_H2_CANRXERROR	the Batt MCP's RX error buffer				8	UINT	
PADDING	Padded bits for CAN	data	232	56	UINT		

AMSAT RC_EPS_DIST_1

Bit Bit Data



Item Name	Description			Offset	Size	Туре	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poi	nt, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, F	Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	SMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	econdsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	OSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ead Conversion: ReceivedTimeFormattedConversion						
RECEIVED_COUNT	COSMOS packet receiv	ved count		0	0	DERIVED		
	Read Conversion:	Read Conversion: ReceivedCountConversion						
LENGTH	Length of TCP-ized CA	N message (alway	s 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current I hardware/software.	PCAN-Ethernet Gai	teway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		oseconds. This is the	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		oseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current I hardware/software.	PCAN-Ethernet Gat	teway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messa	ge.	168	8	UINT		
FLAGS	NOT USED in current I hardware/software.	PCAN-Ethernet Gai	teway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a stanc	lard or extended frame.	194	1	UINT		
CANID_ID	headers.	The ID (normal or extended) portion of the 'CAN ID' set of			29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					



None	one			16	UINT	V
Read Conversion:	Read Conversion: 7.21698125 * value / 4096					
None			240	16	UINT	
None			256	16	UINT	С
Read Conversion:		value / 100.0				
Padded bits for CAN data			272	16	UINT	
	Read Conversion: None None Read Conversion:	Read Conversion: 7.216981 None None Read Conversion:	Read Conversion: 7.21698125 * value / 4096 None Read Conversion: value / 100.0	Read Conversion: 7.21698125 * value / 4096 None 240 None 256 Read Conversion: value / 100.0	Read Conversion: 7.21698125 * value / 4096 None 240 16 None 256 16 Read Conversion: value / 100.0	Read Conversion: 7.21698125 * value / 4096 None 240 16 UINT None 256 16 UINT Read Conversion: value / 100.0

AMSAT RC_EPS_DIST_10

PACKET_TIMESECONDS COSMOS Packet Time (UTC, Floating point, Unix epoch) Read Conversion: PacketTimeSecondsConversion COSMOS Packet Time (Local time zone, Formatted string) Read Conversion: PacketTimeFormattedConversion COSMOS Received Time (UTC, Floating point, Unix epoch) Read Conversion: ReceivedTimeSecondsConversion ReceivedTimeSecondsConversion COSMOS Received Time (Local time zone, Formatted string) Read Conversion: ReceivedTimeFormattedConversion ReceivedTimeFormattedConversion	0 0	DERIVED	%0.6f %0.6f
PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string) Read Conversion: PacketTimeFormattedConversion COSMOS Received Time (UTC, Floating point, Unix epoch) Read Conversion: ReceivedTimeSecondsConversion ReceivedTimeFormatted string) 0 RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) 0	0		%0.6f
Read Conversion: PacketTimeFormattedConversion RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch) 0 Read Conversion: ReceivedTimeSecondsConversion RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) 0	0		%0.6f
RECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch) Read Conversion: Received TimeSecondsConversion RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) 0		DERIVED	%0.6f
Read Conversion: ReceivedTimeSecondsConversion RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) 0		DERIVED	%0.6f
RECEIVED_TIMEFORMATTED COSMOS Received Time (Local time zone, Formatted string) 0			
Read Conversion: ReceivedTimeFormattedConversion	0	DERIVED	
RECEIVED_COUNT COSMOS packet received count 0	0	DERIVED	
Read Conversion: ReceivedCountConversion			
LENGTH Length of TCP-ized CAN message (always 36/0x24 bytes) 0	16	UINT	
FIXED_TYPE Fixed message type for CAN 16 Id Value: 128	16	UINT	
TAG NOT USED in current PCAN-Ethernet Gateway DR 32 hardware/software.	64	UINT	
TIMESTAMP_L Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	32	UINT	
TIMESTAMP_H Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.	32	UINT	
CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 160 hardware/software.	8	UINT	
DLC Date Length Count from the CAN message. 168	8	UINT	



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FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Ga	ateway DR		176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a stan	dard or exte	nded frame.	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 3078231		the 'CAN ID'	set of	195	29	UINT	
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_EPS_DIST_10_BDOT_STATE	BDOT domain state				224	8	UINT	
	State	State Value						
	ON (GREEN)	DN (GREEN) 0						
	OFF_MANUAL (YELLO	OW)		1				
	OFF_OVERCURRENT	Γ(RED)		2				
	OFF_BATT_UNDERV	OLTAGE (RED)		3				
	OFF_INITIAL (YELLO	W)		4				
	OFF_AUTOSHUTOFF	(RED)		5				
	UNKNOWN (RED)			6				
RC_EPS_DIST_10_BDOT_C_MIN	BDOT domain current	t minimum			232	16	INT	Α
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:	RL/0.01 YL/0.08	3 YH/0.12 RH	/0.15				
	Limits Response:	Slacklimitrespons	se					
RC_EPS_DIST_10_BDOT_C_MAX	BDOT domain current	t maximum			248	16	INT	A
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:	RL/0.01 YL/0.08	3 YH/0.12 RH	/0.15				
	Limits Response:	Slacklimitrespons	se					
RC_EPS_DIST_10_BDOT_C_AVG	BDOT domain current	t average			264	16	INT	A
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:		3 YH/0.12 R H	/0.15				
	Limits Response:							



AMSAT RC_EPS_DIST_11

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating po	int, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	condsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone,	Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating	point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	econdsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zon	e, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFor						
RECEIVED_COUNT	COSMOS packet receiv	ved count		0	0	DERIVED		
	Read Conversion:	Read Conversion: ReceivedCountConversion						
LENGTH	Length of TCP-ized CA	NN message (alway	vs 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current l hardware/software.	PCAN-Ethernet Ga	ateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		oseconds. This is the	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		oseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current l hardware/software.	PCAN-Ethernet Ga	ateway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messa	age.	168	8	UINT		
FLAGS	NOT USED in current l hardware/software.	PCAN-Ethernet Ga	ateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	rved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a stan	dard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended headers. Id Value: 30782318		the 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					



0 **STANDARD** RC_EPS_DIST_11_BDOT_V_MIN BDOT domain voltage minimum 224 16 UINT ٧ value * 0.004 Read Conversion: Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse RC_EPS_DIST_11_BDOT_V_MAX BDOT domain voltage maximum 240 UINT Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse RC_EPS_DIST_11_BDOT_V_AVG BDOT domain voltage average 256 16 UINT ٧ Read Conversion: value * 0.004 RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits [DEFAULT]: Slacklimitresponse Limits Response: **PADDING** Padded bits for CAN data 272 16 **UINT**

AMSAT RC_EPS_DIST_12

Item Name	Description	Description				Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	me (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:						
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	me (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		



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FIXED_TYPE	Fixed message type f Id Value: 128	or CAN			16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR		32	64	UINT	
TIMESTAMP_L	Timestamp of the CA lower 4 bytes of the		roseconds. Th	is is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CA upper 4 bytes of the		roseconds. Th	is is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR		160	8	UINT	
DLC	Date Length Count f	rom the CAN mess	sage.		168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR		176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a star	ndard or exter	nded frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823182			195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_EPS_DIST_12_ESTIM_STATE	ESTIM domain state				224	8	UINT	
	State			Value				
	ON (GREEN)			0				
	OFF_MANUAL (YELL	OW)		1				
	OFF_OVERCURREN	T (RED)		2				
	OFF_BATT_UNDER\	OLTAGE (RED)		3				
	OFF_INITIAL (YELLO	W)		4				
	OFF_AUTOSHUTOFF	(RED)		5				
	UNKNOWN (RED)			6				
RC_EPS_DIST_12_ESTIM_C_MIN	ESTIM domain currer	nt minimum			232	16	INT	A
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:	RL/0.01 YL/0.0	8 YH/0.12 RH	/0.15				
	Limits Response:	Slacklimitrespon	ise					
RC_EPS_DIST_12_ESTIM_C_MAX	ESTIM domain current maximum			248	16	INT	A	
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:	RL/0.01 YL/0.0	8 YH/0.12 RH	/0.15				



	Limits Response:	Slacklimitresponse				
RC_EPS_DIST_12_ESTIM_C_AVG	ESTIM domain current	t average	264	16	INT	Α
	Read Conversion:	value / 2048.0				
	Limits [DEFAULT]:	RL/0.01 YL/0.08 YH/0.12 RH/0.15				
	Limits Response:	Slacklimitresponse				
PADDING	Padded bits for CAN d	lata	280	8	UINT	

AMSAT RC_EPS_DIST_13

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	COSMOS Received Time (UTC, Floating point, Unix epoch)					%0.6f
	Read Conversion:	ead Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti	COSMOS Received Time (Local time zone, Formatted string)					
	Read Conversion:	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAI lower 4 bytes of the t	N message, in microseconds. This is the imestamp.	96	32	UINT		
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			UINT		
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			UINT		
DLC	Date Length Count fr	om the CAN message.	168	8	UINT		



FLAGS	NOT USED in current F hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				UINT	
CANID_PADDING	Fixed value of 0 - reser	ved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	indicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823183				29	UINT	
	State Value						
	EXTENDED 1						
	STANDARD	STANDARD 0					
RC_EPS_DIST_13_ESTIM_V_MIN	ESTIM domain voltage	ESTIM domain voltage minimum				UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	nse				
RC_EPS_DIST_13_ESTIM_V_MAX	ESTIM domain voltage	maximum		240	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	nse				
RC_EPS_DIST_13_ESTIM_V_AVG	ESTIM domain voltage	average		256	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0					
	Limits Response:	Slacklimitrespo	nse				
PADDING	Padded bits for CAN da	ata		272	16	UINT	

AMSAT RC_EPS_DIST_14

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f



	Read Conversion:	ReceivedTimeSe	econdsConver	sion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Local time zone	e, Formatted s	tring)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFor	rmattedConve	rsion				
RECEIVED_COUNT	COSMOS packet receive	ed count			0	0	DERIVED	
	Read Conversion:	ReceivedCou	untConversion					
LENGTH	Length of TCP-ized CAN	l message (alway	s 36/0x24 byt	es)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	CAN			16	16	UINT	
TAG	NOT USED in current Pohardware/software.	IOT USED in current PCAN-Ethernet Gateway DR ardware/software.					UINT	
TIMESTAMP_L	Timestamp of the CAN I	nestamp of the CAN message, in microseconds. This is the lower sytes of the timestamp.					UINT	
TIMESTAMP_H		nestamp of the CAN message, in microseconds. This is the per 4 bytes of the timestamp.					UINT	
CHANNEL	NOT USED in current Ponardware/software.	CAN-Ethernet Ga	teway DR		160	8	UINT	
DLC	Date Length Count from	m the CAN messa	ge.		168	8	UINT	
FLAGS	NOT USED in current Pohardware/software.	CAN-Ethernet Ga	teway DR		176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserv	ved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the m	nessage is a stand	dard or extend	ed frame.	194	1	UINT	
CANID_ID	The ID (normal or externeaders. Id Value: 307823184		the 'CAN ID' se	et of	195	29	UINT	
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_EPS_DIST_14_EPS_STATE	EPS domain state				224	8	UINT	
	State			Value				
	ON (GREEN)			0				
	OFF_MANUAL (YELLOV			1				
	OFF_OVERCURRENT (2				
	OFF_BATT_UNDERVOLTAGE (RED) 3							

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5

OFF_INITIAL (YELLOW)

UNKNOWN (RED)

OFF_AUTOSHUTOFF (RED)



232 RC_EPS_DIST_14_EPS_C_MIN EPS domain current minimum 16 INT value / 2048.0 Read Conversion: Limits [DEFAULT]: RL/0.01 YL/0.08 YH/0.12 RH/0.15 Limits Response: Slacklimitresponse RC_EPS_DIST_14_EPS_C_MAX EPS domain current maximum 248 INT Read Conversion: value / 2048.0 RL/0.01 YL/0.08 YH/0.12 RH/0.15 Limits [DEFAULT]: Limits Response: Slacklimitresponse RC_EPS_DIST_14_EPS_C_AVG EPS domain current average 264 16 INT Α Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.01 YL/0.08 YH/0.12 RH/0.15 Limits Response: Slacklimitresponse **PADDING** Padded bits for CAN data 280 8 UINT

AMSAT RC_EPS_DIST_15

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	EIVED_COUNT COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)		0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT		



TAG	NOT USED in current I hardware/software.	T USED in current PCAN-Ethernet Gateway DR dware/software.				UINT	
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timestal		oseconds. This is the lower	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		oseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current I hardware/software.	PCAN-Ethernet Ga	teway DR	160	8	UINT	
DLC	Date Length Count fro	Date Length Count from the CAN message.			8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	ndicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823185			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD	STANDARD 0					
RC_EPS_DIST_15_EPS_V_MIN	EPS domain voltage m	ninimum		224	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	onse				
RC_EPS_DIST_15_EPS_V_MAX	EPS domain voltage m	naximum		240	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	nse				
RC_EPS_DIST_15_EPS_V_AVG	EPS domain voltage av	verage		256	16	UINT	V
	Read Conversion:	Read Conversion: value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	inse				
PADDING	Padded bits for CAN d	ata		272	16	UINT	

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating po	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSe	econdsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone,	, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFor	rmattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floating	point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeS	SecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	DSMOS Received Time (Local time zone, Formatted string)			0	DERIVED		
	Read Conversion:	ReceivedTimeFo	ormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ved count		0	0	DERIVED		
	Read Conversion:	ReceivedCo	ountConversion					
LENGTH	Length of TCP-ized CA	AN message (alwa	ys 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		roseconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		roseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN mess	sage.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet G	ateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a star	ndard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or ext headers. Id Value: 30782318		f the 'CAN ID' set of	195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					



224 8 UINT RC_EPS_DIST_16_PPT_STATE PPT domain state State Value ON (GREEN) 0 OFF_MANUAL (YELLOW) 1 OFF_OVERCURRENT (RED) 2 OFF_BATT_UNDERVOLTAGE (RED) 3 OFF_INITIAL (YELLOW) 4 OFF_AUTOSHUTOFF (RED) 5 UNKNOWN (RED) RC_EPS_DIST_16_PPT_C_MIN PPT domain current minimum 232 16 INT Α Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.1 YL/0.25 YH/0.4 RH/0.5 Limits Response: Slacklimitresponse 248 16 INT Α Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.1 YL/0.25 YH/0.4 RH/0.5 Limits Response: Slacklimitresponse RC_EPS_DIST_16_PPT_C_AVG PPT domain current average 264 Α 16 INT Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.1 YL/0.25 YH/0.4 RH/0.5 Limits Response: Slacklimitresponse

AMSAT RC_EPS_DIST_17

Padded bits for CAN data

PADDING

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					

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UINT

RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zone	e, Formatted string)	0	0	DERIVED	
	Read Conversion: ReceivedTimeFormattedConversion						
RECEIVED_COUNT	COSMOS packet received count				0	DERIVED	
	Read Conversion:	ReceivedCou	untConversion				
LENGTH	Length of TCP-ized Ca	AN message (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Ga	teway DR	32	64	UINT	
TIMESTAMP_L		mestamp of the CAN message, in microseconds. This is the lower bytes of the timestamp.			32	UINT	
TIMESTAMP_H		imestamp of the CAN message, in microseconds. This is the pper 4 bytes of the timestamp.				UINT	
CHANNEL	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.			8	UINT	
DLC	Date Length Count fr	ate Length Count from the CAN message.			8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a stand	lard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823187			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_DIST_17_PPT_V_MIN	PPT domain voltage r	ninimum		224	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitresponse					
RC_EPS_DIST_17_PPT_V_MAX	PPT domain voltage maximum		240	16	UINT	V	
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo					



٧ 256 16 UINT Read Conversion: value * 0.004 $\label{limits DEFAULT]:} \ Limits [DEFAULT]:$ RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse PADDING Padded bits for CAN data 272 16 UINT

Item Name	Description	Description				Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	ne (I	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	racketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	ne (I	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Read Conversion: PacketTimeFormattedConversion						
RECEIVED_TIMESECONDS	COSMOS Received T	COSMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	Read Conversion: ReceivedTimeSecondsConversion						
RECEIVED_TIMEFORMATTED	COSMOS Received T string)	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	Re	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rec	eive	ed count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized (CAN	message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for	CAN	16	16	UINT		
TAG	NOT USED in curren hardware/software.	nt Po	CAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CA the lower 4 bytes of		message, in microseconds. This is timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA		nessage, in microseconds. This is e timestamp.	128	32	UINT		
CHANNEL	NOT USED in curren hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			8	UINT		
DLC	Date Length Count	fror	n the CAN message.	168	8	UINT		
FLAGS	NOT USED in curren hardware/software.	nt Po	CAN-Ethernet Gateway DR	176	16	UINT		



CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.			1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823323			29	UINT	
	State Value					
	EXTENDED 1					
	STANDARD	0				
RC_EPS_DIST_18_BDOT_OCP_THRESH	BDOT current threshold		224	9	UINT	Α
	Read Conversion:	value / 20.0				
RC_EPS_DIST_18_COM2_OCP_THRESH	COM2 current threshold		233	9	UINT	Α
	Read Conversion:	value / 20.0				
RC_EPS_DIST_18_EPS_OCP_THRESH	EPS current threshold		242	9	UINT	Α
	Read Conversion:	value / 20.0				
RC_EPS_DIST_18_ESTIM_OCP_THRESH	ESTIM current threshold		251	9	UINT	Α
	Read Conversion:	value / 20.0				
RC_EPS_DIST_18_PPT_OCP_THRESH	PPT current threshold		260	9	UINT	Α
	Read Conversion:	value / 20.0				
RC_EPS_DIST_18_RAHS_OCP_THRESH	RAHS current threshold		269	9	UINT	Α
	Read Conversion:	value / 20.0				
PADDING	Padded bits for CAN data		278	10	UINT	

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (L	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (L	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					

RECEIVED_TIMESECONDS	COSMOS Received Tin	niv enoch)	0	0	DERIVED	%0.6f		
RECEIVED_TIMESECONDS	Read Conversion:	ReceivedTimeSe			U	U	DERIVED	700.01
	Redu Conversion.	Received Times	econus	Conversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone	e, Forma	atted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimeFo	rmatte	dConversion				
RECEIVED_COUNT	COSMOS packet receiv	ved count			0	0	DERIVED	
	Read Conversion:	Read Conversion: ReceivedCountConversion						
LENGTH	Length of TCP-ized CA	N message (always	s 36/0x	24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for CAN Id Value: 128					16	UINT	
TAG	NOT USED in current l hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.					UINT	
TIMESTAMP_L	•	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.					UINT	
TIMESTAMP_H		Fimestamp of the CAN message, in microseconds. This is the upper bytes of the timestamp.					UINT	
CHANNEL	NOT USED in current landware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.					UINT	
DLC	Date Length Count fro	om the CAN messag	ge.		168	8	UINT	
FLAGS	NOT USED in current landware/software.	PCAN-Ethernet Gat	ceway D	PR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	rved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	message is a stand	lard or	extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended Id Value: 30782317		he 'CAl	ID' set of headers.	195	29	UINT	
	State		Valu	ie				
	EXTENDED		1					
	STANDARD		0					
RC_EPS_DIST_2_UV_STATE	Undervoltage State				224	8	UINT	
	State			Value				
	NORMAL			0				
	UNDERVOLTAGE			1				
RC_EPS_DIST_2_MET	Mission elapsed time fir	Mission elapsed time first 4 bytes					UINT	S
	Read Conversion:		value	>> 8				



PADDING	Padded bits for CAN data	272	16	UINT

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Pac	cketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local	time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: Pack	ketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTO	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Rece	eivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Loc	DSMOS Received Time (Local time zone, Formatted string)		0	DERIVED		
	Read Conversion: Rece	ivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received co	unt	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN mes	sage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT		
TAG	NOT USED in current PCAN-E hardware/software.	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN messa 4 bytes of the timestamp.	age, in microseconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN messa upper 4 bytes of the timestal	age, in microseconds. This is the mp.	128	32	UINT		
CHANNEL	NOT USED in current PCAN-E hardware/software.	Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count from the	CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-E hardware/software.	Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the message	ge is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended)) portion of the 'CAN ID' set of	195	29	UINT		



headers. Id Value: 307823173 **State** Value **EXTENDED** 1 0 STANDARD RC_EPS_DIST_3_BATT_V_MIN Battery voltage minimum 224 16 UINT ٧ Read Conversion: 7.21698125 * value / 4096 Limits [DEFAULT]: RL/5.2 YL/5.8 YH/7.3 RH/7.7 Limits Response: Slacklimitresponse 240 16 UINT RC_EPS_DIST_3_BATT_V_MAX Battery voltage maximum 7.21698125 * value / 4096 Read Conversion: Limits [DEFAULT]: RL/5.2 YL/5.8 YH/7.3 RH/7.7 Limits Response: Slacklimitresponse 256 UINT ٧ RC_EPS_DIST_3_BATT_V_AVG Battery voltage average 16 Read Conversion: 7.21698125 * value / 4096 Limits [DEFAULT]: RL/5.2 YL/5.8 YH/7.3 RH/7.7 Limits Response: Slacklimitresponse

AMSAT RC_EPS_DIST_4

Padded bits for CAN data

PADDING

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed count	0	0	DERIVED		

272

16

UINT



	Read Conversion:	Read Conversion: ReceivedCountConversion						
LENGTH	Length of TCP-ized CA	AN message (alway	s 36/0x24 by	tes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN			16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Ga	teway DR		32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		oseconds. This	s is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN	Fimestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.				32	UINT	
CHANNEL	NOT USED in current	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			160	8	UINT	
DLC	Date Length Count from the CAN message.			168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the	message is a stand	dard or extend	ded frame.	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 30887175		the 'CAN ID' s	et of	195	29	UINT	
	State		Value					
	EXTENDED		1					
	STANDARD		0					
RC_EPS_DIST_4_COM1_STATE	COM1 domain state				224	8	UINT	
	State			Value				
	ON (GREEN)			0				
	OFF_MANUAL (YELLO	DW)		1				
	OFF_OVERCURRENT	(RED)		2				
	OFF_BATT_UNDERV	OLTAGE (RED)		3				
	OFF_INITIAL (YELLO	W)		4				
	UNKNOWN (RED)			5				
RC_EPS_DIST_4_COM1_C_MIN	COM1 domain current minimum			232	16	INT	A	
	Read Conversion:	lead Conversion: value / 2048.0						
	Limits [DEFAULT]: RL/0.01 YL/0.08 YH/0.12 RH/0.15							
	Limits Response:							
RC_EPS_DIST_4_COM1_C_MAX	COM1 domain current	t maximum			248	16	INT	A



Read Conversion:	value / 2048.0
Limits [DEFAULT]:	RL/0.01 YL/0.08 YH/0.12 RH/0.15
Limits Response:	Slacklimitresponse

RC_EPS_DIST_4_COM1_C_AVG	COM1 domain current	264	16	INT	А	
	Read Conversion:	Read Conversion: value / 2048.0				
	Limits [DEFAULT]:	RL/0.01 YL/0.08 YH/0.12 RH/0.15				
	Limits Response:	Slacklimitresponse				
PADDING	Padded bits for CAN data			8	UINT	

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC,	Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pad	cketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Loca	I time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pac	ketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	ne (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Rec	eivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	0	0	DERIVED				
	Read Conversion:	Rece	eivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ved co	punt	0	0	DERIVED		
	Read Conversion:	I	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN mes	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	r CAN		16	16	UINT		
TAG	NOT USED in current F hardware/software.	PCAN-	Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT		
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			32	UINT		
CHANNEL	NOT USED in current P	PCAN-	Ethernet Gateway DR	160	8	UINT		



	hardware/software.						
DLC	Date Length Count fron	n the CAN messa	ige.	168	8	UINT	
FLAGS	NOT USED in current PC hardware/software.	CAN-Ethernet Ga	teway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserv	red.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the m	nessage is a stand	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823175			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_DIST_5_COM1_V_MIN	COM1 domain voltage n	ninimum		224	16	UINT	V
	Read Conversion:	Read Conversion: value * 0.004					
	Limits [DEFAULT]:	PEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0					
	Limits Response:	Slacklimitrespo					
RC_EPS_DIST_5_COM1_V_MAX	COM1 domain voltage n	naximum		240	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespo	nse				
RC_EPS_DIST_5_COM1_V_AVG	COM1 domain voltage a	verage		256	16	UINT	V
	Read Conversion:	Read Conversion: value * 0.004					
	Limits [DEFAULT]:	T]: RL/0.5 YL/3.0 YH/7.0 RH/10.0					
	Limits Response:	Slacklimitresponse					
PADDING	Padded bits for CAN dat	a		272	16	UINT	

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (0	0	DERIVED		%0.6f	
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (COSMOS Packet Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					



RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating բ	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSe	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received T	ime (Local time zon	e, Formatted string)	0	0	DERIVED	
	Read Conversion:	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized C	CAN message (alway	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type t	Fixed message type for CAN Id Value: 128			16	UINT	
TAG	NOT USED in current hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR nardware/software.			64	UINT	
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT	
TIMESTAMP_H		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			32	UINT	
CHANNEL	NOT USED in current hardware/software.	: PCAN-Ethernet Ga	teway DR	160	8	UINT	
DLC	Date Length Count f	rom the CAN messa	age.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Ethernet Ga	teway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	e message is a stand	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or exheaders. Id Value: 3078231		the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_DIST_6_COM2_STATE	COM2 domain state			224	8	UINT	

State	Value
ON (GREEN)	0
OFF_MANUAL (YELLOW)	1
OFF_OVERCURRENT (RED)	2
OFF_BATT_UNDERVOLTAGE (RED)	3
OFF INITIAL (YELLOW)	4

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OFF_AUTOSHUTOFF (RED) 5 UNKNOWN (RED) RC_EPS_DIST_6_COM2_C_MIN COM2 domain current minimum 232 16 INT Α Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.07 YL/0.095 YH/0.135 RH/0.2 Limits Response: Slacklimitresponse RC_EPS_DIST_6_COM2_C_MAX COM2 domain current maximum 248 16 INT Α Read Conversion: value / 2048.0 Limits [DEFAULT]: RL/0.07 YL/0.095 YH/0.135 RH/0.2 Limits Response: Slacklimitresponse RC_EPS_DIST_6_COM2_C_AVG COM2 domain current average 264 16 INT Read Conversion: value / 2048.0 RL/0.07 YL/0.095 YH/0.135 RH/0.2 Limits [DEFAULT]: Limits Response: Slacklimitresponse

280

UINT

AMSAT RC_EPS_DIST_7

Padded bits for CAN data

PADDING

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)			0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count			0	DERIVED		
	Read Conversion:	ReceivedCountConversion					

ellite Lab							
LENGTH	Length of TCP-ized CA	AN message (always	s 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gat	reway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		seconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		seconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gat	ceway DR	160	8	UINT	
DLC	Date Length Count fro	om the CAN messa	ge.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	ceway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	ndicates whether the message is a standard or extended frame.			1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823177			195	29	UINT	
	State		Value				
	EXTENDED 1		1				
	STANDARD 0		0				
						LINIT	.,
RC_EPS_DIST_7_COM2_V_MIN	COM2 domain voltage			224	16	UINT	V
	Read Conversion:	value * 0.004	VIII O DIVIO O				
	Limits [DEFAULT]:		YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespor	nse				
RC_EPS_DIST_7_COM2_V_MAX	COM2 domain voltage	e maximum		240	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:	RL/0.5 YL/3.0	YH/7.0 RH/10.0				
	Limits Response:	Slacklimitrespoi	nse				
RC_EPS_DIST_7_COM2_V_AVG	COM2 domain voltage	e average		256	16	UINT	V
	Read Conversion:	Read Conversion: value * 0.004					
	Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0						
	Limits Response:	Slacklimitrespor	nse				
PADDING	Padded bits for CAN d	ata		272	16	UINT	



Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating poi	nt, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSec	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, F	Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	nattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ne (UTC, Floating p	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSe	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zone	e, Formatted string)	0	0	DERIVED		
	Read Conversion:	ead Conversion: ReceivedTimeFormattedConversion						
RECEIVED_COUNT	COSMOS packet recei	COSMOS packet received count				DERIVED		
	Read Conversion:	ReceivedCou	untConversion					
LENGTH	Length of TCP-ized CA	Length of TCP-ized CAN message (always 36/0x24 bytes)				UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	Fixed message type for CAN Id Value: 128			16	UINT		
TAG	NOT USED in current hardware/software.	PCAN-Ethernet Gat	teway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		seconds. This is the lower	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		seconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet Gai	teway DR	160	8	UINT		
DLC	Date Length Count fro	om the CAN messa	ge.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet Gat	teway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the	message is a stanc	lard or extended frame.	194	1	UINT		
CANID_ID	CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823178			195	29	UINT		
	State Value							
	EXTENDED							



	STANDARD		0					
	STANDARD		U					
DC EDC DICT 9 DAUG CTATE	RAHS domain state				224	8	UINT	
RC_EPS_DIST_8_RAHS_STATE				V-b	224	0	OIMI	
	State			Value				
	ON (GREEN)			0				
	OFF_MANUAL (YELLO	•		1				
	OFF_OVERCURRENT			2				
	OFF_BATT_UNDERV	OLTAGE (RED)		3				
	OFF_INITIAL (YELLO	W)		4				
	OFF_AUTOSHUTOFF	(RED)		5				
	UNKNOWN (RED)			6				
RC_EPS_DIST_8_RAHS_C_MIN	RAHS domain current	RAHS domain current minimum		232	16	INT	Α	
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]: RL/0.01 YL/0.08 YH/0.12 RH/0.15		0.15					
	Limits Response:	Slacklimitresponse						
RC_EPS_DIST_8_RAHS_C_MAX	RAHS domain current	maximum			248	16	INT	Α
	Read Conversion:	value / 2048.0						
	Limits [DEFAULT]:	RL/0.01 YL/0.08	3 YH/0.12 RH/	0.15				
	Limits Response:	Slacklimitrespons	se					
RC_EPS_DIST_8_RAHS_C_AVG	RAHS domain current	average			264	16	INT	Α
	Read Conversion: value / 2048.0							
	Limits [DEFAULT]:	nits [DEFAULT]: RL/0.01 YL/0.08 YH/0.12 RH/0.15		0.15				
	Limits Response:							
PADDING	Padded bits for CAN d	lata			280	8	UINT	
		aded bits for or are data						

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (SMOS Packet Time (UTC, Floating point, Unix epoch)			DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

	Read Conversion:	ReceivedTime	SecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	me (Local time zo	one, Formatted string)	0	0	DERIVED	
	Read Conversion:	ReceivedTimel	FormattedConversion				
RECEIVED_COUNT	COSMOS packet recei	ived count		0	0	DERIVED	
	Read Conversion:	ReceivedC	CountConversion				
LENGTH	Length of TCP-ized CA	AN message (alw	ays 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN		16	16	UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet (Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN 4 bytes of the timesta		croseconds. This is the lowe	r 96	32	UINT	
TIMESTAMP_H		imestamp of the CAN message, in microseconds. This is the pper 4 bytes of the timestamp.					
CHANNEL	NOT USED in current hardware/software.	160	8	UINT			
DLC	Date Length Count fr	Date Length Count from the CAN message.				UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet (Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the	message is a sta	indard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 3078231		of the 'CAN ID' set of	195	.95 29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
DC EDC DIST O DAUG V MIN	DALIC domain voltage	minimum		224	16	UINT	V
RC_EPS_DIST_9_RAHS_V_MIN	RAHS domain voltage			224	10	OINI	V
		Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse					
	Limits Response:						
RC_EPS_DIST_9_RAHS_V_MAX	RAHS domain voltage	240	16	UINT	V		
	Read Conversion:						
	Limits [DEFAULT]:	RL/0.5 YL/3	.0 YH/7.0 RH/10.0				



Limits Response:	Slacklimitresponse				
RC_EPS_DIST_9_RAHS_V_AVG RAHS domain voltage average					V
Read Conversion:	value * 0.004				
Limits [DEFAULT]:	RL/0.5 YL/3.0 YH/7.0 RH/10.0				
Limits Response:	Slacklimitresponse				
Padded bits for CAN data	Э	272	16	UINT	
	RAHS domain voltage av Read Conversion: Limits [DEFAULT]: Limits Response:	RAHS domain voltage average Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0	RAHS domain voltage average 256 Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse	RAHS domain voltage average 256 16 Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse	RAHS domain voltage average 256 16 UINT Read Conversion: value * 0.004 Limits [DEFAULT]: RL/0.5 YL/3.0 YH/7.0 RH/10.0 Limits Response: Slacklimitresponse

Item Name	Description	Bit Offse	Bit et Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating poi	int, Unix epoch) 0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSeco	ondsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone,	Formatted string) 0	0	DERIVED		
	Read Conversion: PacketTimeForm	nattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating p	point, Unix epoch) 0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSer	condsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone	e, Formatted string) 0	0	DERIVED		
	Read Conversion: ReceivedTimeFor	mattedConversion				
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCou	ntConversion				
LENGTH	Length of TCP-ized CAN message (alway	rs 36/0x24 bytes) 0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Ga hardware/software.	teway DR 32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in micro lower 4 bytes of the timestamp.	oseconds. This is the 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in micro upper 4 bytes of the timestamp.	oseconds. This is the 128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Ga hardware/software.	teway DR 160	8	UINT		
DLC	Date Length Count from the CAN messa	age. 168	8	UINT		

FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet G	ateway DR		176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.			192	1	UINT	
CANID_RTR	RTR value.				193	1	UINT	
CANID_TYPE	Indicates whether the frame.	e message is a stan	ndard or extended		194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 308871779				195	29	UINT	
	State Value							
	EXTENDED 1		1					
	STANDARD							
RC_EPS_DIST_H1_TEMP_MIN	Temperature of MSP				224	16	INT	С
	Read Conversion:	Conversion: value / 100.0						
	Limits [DEFAULT]:	RL/15.0 YL/20.0	O YH/30.0 RH/35.0	0				
	Limits Response:	Slacklimitrespon	se					
RC_EPS_DIST_H1_TEMP_MAX	Temperature of MSP				240	16	INT	С
	Read Conversion:	value / 100.0						
	Limits [DEFAULT]:	RL/15.0 YL/20.0	O YH/30.0 RH/35.0	0				
	Limits Response: Slacklimitresponse							
RC_EPS_DIST_H1_TEMP_AVG	Temperature of MSP				256	16	INT	С
	Read Conversion: value / 100.0							
	Limits [DEFAULT]:	RL/15.0 YL/20.0) YH/30.0 RH/35.0	0				
	Limits Response:	Slacklimitrespon	se					
RC_EPS_DIST_H1_SYSRSTIV	Reason for reset				272	8	UINT	
	State		V	alue				
	NO_INTERRUPT_PE	ENDING	0					
	(BOR)_BROWNOUT	-	2					
	(BOR)_RSTIFG_RST	/NMI	6					
	(BOR)_LPMX.5_WA	KE_UP	8					
	(BOR)_SECURITY_\	/IOLATION	10)				
	(BOR)_SVSHIFG_SV	SH_EVENT	14	1				
	(POR)_PMMSWPOR							
	(PUC)_WDTIFG_W/							
	(PUC)_WDTPW_PA							
	(PUC)_FRCTLPW_P							
	(PUC)_UNCORRECT	ABLE_FRAM_BIT_	ERR 28	3				



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	(PUC)_PERIPHERAL_AREA_FETCH	30				
	(PUC)_PMMPW_PMM_PWD_VIOLATION	32				
	(PUC)_MPUPW_MPU_PWD_VIOLATION	34				
	(PUC)_CSPW_CS_PASSWORD_VIOLATION	36				
	(PUC)_MPUSEGIPIFGENCAPIPMEMSEG	38				
	(PUC)_MPUSEGIIFGINFOMEMSEGVIOL	40				
	(PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL	42				
	(PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL	44				
	(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL	46				
RC_EPS_DIST_H1_RESET_COUNT	Reset Count		280	8	UINT	

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAI	N message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN	16	16	UINT		
TAG	NOT USED in current P hardware/software.	CAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L		Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.					
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the tir	message, in microseconds. This is the mestamp.	128	32	UINT		



CHANNEL NOT USED in current PCAN-Ethernet Gateway DR 8 UINT 160 hardware/software. DLC Date Length Count from the CAN message. 168 8 UINT **FLAGS** 176 **UINT** NOT USED in current PCAN-Ethernet Gateway DR 16 hardware/software. CANID_PADDING Fixed value of 0 - reserved. 192 UINT 1 CANID_RTR RTR value. 193 UINT CANID_TYPE Indicates whether the message is a standard or extended frame. UINT 194 1 CANID_ID The ID (normal or extended) portion of the 'CAN ID' set of 195 29 UINT headers. Id Value: 308871788 **State** Value **EXTENDED** 1 0 STANDARD

224

232

8

56

UINT

UINT

AMSAT RC_EPS_GEN_1

PADDING

RC_EPS_DIST_H2_CANRXERROR the Dist MCP's RX error buffer

Padded bits for CAN data

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	ived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	AN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CAN	16	16	UINT		

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TAG	NOT USED in current PCAN-Ethernet G hardware/software.	Gateway D	R	32	64	UINT
TIMESTAMP_L	Timestamp of the CAN message, in mic lower 4 bytes of the timestamp.	crosecond	s. This is the	96	32	UINT
TIMESTAMP_H	Timestamp of the CAN message, in mic upper 4 bytes of the timestamp.	rosecond	s. This is the	128	32	UINT
CHANNEL	NOT USED in current PCAN-Ethernet G hardware/software.	ateway D	R	160	8	UINT
DLC	Date Length Count from the CAN mess	sage.		168	8	UINT
FLAGS	NOT USED in current PCAN-Ethernet G hardware/software.	Gateway D	R	176	16	UINT
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended Frame.			194	1	UINT
CANID_ID	The ID (normal or extended) portion on headers. Id Value: 307823120	195	29	UINT		
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_EPS_GEN_1_PNL_1_ENABLED	whether gen panel 1 is enabled			224	1	UINT
	State	Va	alue			
	DISABLED (RED)	0				
	ENABLED (GREEN) 1					
RC_EPS_GEN_1_PNL_2_ENABLED	whether gen panel 2 is enabled			225	1	LITAIT
	EPS_GEN_1_PNL_2_ENABLED whether gen panel 2 is enabled			225	1	UINT
	State	Va	alue	223	1	UINI
	State DISABLED (RED)	V a	alue	223	1	OINT
			alue	223	1	UINT
	DISABLED (RED)	0	alue	223	•	UINT
RC_EPS_GEN_1_PNL_3_ENABLED	DISABLED (RED)	0	alue	226	1	UINT
RC_EPS_GEN_1_PNL_3_ENABLED	DISABLED (RED) ENABLED (GREEN)	0	alue			
RC_EPS_GEN_1_PNL_3_ENABLED	DISABLED (RED) ENABLED (GREEN) whether gen panel 3 is enabled	0				
RC_EPS_GEN_1_PNL_3_ENABLED	DISABLED (RED) ENABLED (GREEN) whether gen panel 3 is enabled State	0 1				
RC_EPS_GEN_1_PNL_3_ENABLED RC_EPS_GEN_1_PNL_1_CHARGING	DISABLED (RED) ENABLED (GREEN) whether gen panel 3 is enabled State DISABLED (RED) ENABLED (GREEN)	0 1 Va 0				
	DISABLED (RED) ENABLED (GREEN) whether gen panel 3 is enabled State DISABLED (RED) ENABLED (GREEN)	0 1 Va 0		226	1	UINT
	DISABLED (RED) ENABLED (GREEN) whether gen panel 3 is enabled State DISABLED (RED) ENABLED (GREEN) whether gen panel 1 is charing	0 1 Va 0	alue	226	1	UINT

UINT

230

58



PADDING

UINT RC_EPS_GEN_1_PNL_2_CHARGING whether gen panel 2 is charing 228 State Value NOTCHARGING (YELLOW) 0 CHARGING (GREEN) 1 RC_EPS_GEN_1_PNL_3_CHARGING whether gen panel 3 is charing 229 1 UINT Value State NOTCHARGING (YELLOW) 0 CHARGING (GREEN)

AMSAT RC_EPS_GEN_10

Padded bits for CAN data

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	COSMOS Packet Time (UTC, Floating point, Unix epoch)			DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	TEFORMATTED COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rec	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized (CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in curren hardware/software.	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.					
TIMESTAMP_L	-	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.					



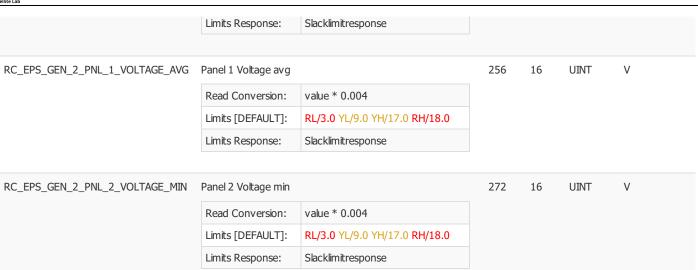
TIMESTAMP_H	Timestamp of the CAN messa the upper 4 bytes of the time			128	32	UINT	
CHANNEL	NOT USED in current PCAN-E hardware/software.	Ethernet	: Gateway DR	160	8	UINT	
DLC	Date Length Count from the	CAN m	essage.	168	8	UINT	
FLAGS	NOT USED in current PCAN-E hardware/software.	Ethernet	: Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 309920562			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_10_PNL_1_POWER_AVG	None			224	16	UINT	W
	Read Conversion:	value ³	* 3 / 3276.8				
RC_EPS_GEN_10_PNL_2_POWER_AVG	None			240	16	UINT	W
	Read Conversion:	value ³	* 3 / 3276.8				
RC_EPS_GEN_10_PNL_3_POWER_AVG	None		256	16	UINT	W	
	Read Conversion:	value ^{>}	* 3 / 3276.8				
PADDING	Padded bits for CAN data			272	16	UINT	

AMSAT RC_EPS_GEN_2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					

RECEIVED_TIMEFORMATTED	COSMOS Received Ti string)	me (Local time	zone, Formatted	0	0	DERIVED	
	Read Conversion:	ReceivedTimeF	FormattedConversion				
RECEIVED_COUNT	COSMOS packet received count				0	DERIVED	
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized C	AN message (a	lways 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type f	ixed message type for CAN				UINT	
	Id Value: 128						
TAG		IOT USED in current PCAN-Ethernet Gateway DR ardware/software.				UINT	
TIMESTAMP_L		imestamp of the CAN message, in microseconds. This is he lower 4 bytes of the timestamp.				UINT	
TIMESTAMP_H	Timestamp of the CA	imestamp of the CAN message, in microseconds. This is					
		Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.					
CHANNEL		NOT USED in current PCAN-Ethernet Gateway DR					
		hardware/software.					
DLC	Date Length Count fi	rom the CAN m	lessage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Etherne	t Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the frame.	e message is a s	standard or extended	194	1	UINT	
CANID_ID	The ID (normal or ex	tended) portior	n of the 'CAN ID' set of	195	95 29	UINT	
	headers. Id Value: 307823121						
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_2_PNL_1_VOLTAGE_MIN	Panel 1 Voltage min			224	16	UINT	V
	Read Conversion:	value * 0.004	1				
	Limits [DEFAULT]: RL/3.0 YL/9.0 YH/17.0 RH/18.0						
	Limits Response: Slacklimitresponse						
RC_EPS_GEN_2_PNL_1_VOLTAGE_MAX	Panel 1 Voltage max			240	16	UINT	V
	Read Conversion:	value * 0.004	1				
	Limits [DEFAULT]:	RL/3.0 YL/9.0) YH/17.0 RH/18.0				
		i					





AMSAT RC_EPS_GEN_3

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T string)	ime (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized C	CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			64	UINT		
TIMESTAMP_L	Timestamp of the CA the lower 4 bytes of	N message, in microseconds. This is the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CA	NN message, in microseconds. This is	128	32	UINT		

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	the upper 4 bytes of	the timestamp					
CHANNEL	NOT USED in current hardware/software.	PCAN-Etherne	t Gateway DR	160	8	UINT	
DLC	Date Length Count fi	rom the CAN m	iessage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	: PCAN-Etherne	t Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - res	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the frame.	e message is a s	standard or extended	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823122			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_3_PNL_2_VOLTAGE_MAX	Panel 2 Voltage max			224	16	UINT	V
	Read Conversion: value * 0.004						
	Limits [DEFAULT]: RL/3.0 YL/9.0 YH/17.0 RH/18.0						
	Limits Response:	Slacklimitresp	onse				
RC_EPS_GEN_3_PNL_2_VOLTAGE_AVG	Panel 2 Voltage avg			240	16	UINT	V
	Read Conversion:	value * 0.004	1				
	Limits [DEFAULT]:	RL/3.0 YL/9.0) YH/17.0 RH/18.0				
	Limits Response:	Slacklimitresp	onse				
RC_EPS_GEN_3_PNL_3_VOLTAGE_MIN	Panel 3 Voltage min			256	16	UINT	V
	Read Conversion:	value * 0.004	1				
	Limits [DEFAULT]:	RL/3.0 YL/9.0) YH/17.0 RH/18.0				
	Limits Response:	Slacklimitresp	onse				
RC_EPS_GEN_3_PNL_3_VOLTAGE_MAX	Panel 3 Voltage max			272	16	UINT	V
	Read Conversion:	value * 0.004					
	Limits [DEFAULT]:) YH/17.0 RH/18.0				
	Limits Response:	Slacklimitresp	onse				

AMSAT RC_EPS_GEN_4

Bit Bit Data

Item Name	Description		Offset	Size	Туре	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floati	ng point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTime	SecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time	zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeF	FormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Flo	ating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Received Time	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local tim string)	COSMOS Received Time (Local time zone, Formatted string)			DERIVED		
	Read Conversion: ReceivedTime	eFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		
	Read Conversion: Received	CountConversion					
LENGTH	Length of TCP-ized CAN message	(always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT		
TAG	NOT USED in current PCAN-Ethern hardware/software.	net Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in the lower 4 bytes of the timestam		96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in the upper 4 bytes of the timestam		128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethern hardware/software.	net Gateway DR	160	8	UINT		
DLC	Date Length Count from the CAN	message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethern hardware/software.	net Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the message is a frame.	a standard or extended	194	1	UINT		
CANID_ID	The ID (normal or extended) port headers. Id Value: 307823123	ne ID (normal or extended) portion of the 'CAN ID' set of eaders.		29	UINT		
	State						
	EXTENDED	1					
	STANDARD	0					



RC_EPS_GEN_4_PNL_3_VOLTAGE_AVG 224 16 UINT ٧ Panel 3 Voltage avg Read Conversion: value * 0.004 Limits [DEFAULT]: RL/3.0 YL/9.0 YH/17.0 RH/18.0 Limits Response: Slacklimitresponse 240 16 RC_EPS_GEN_4_PNL_1_CURRENT_MIN Panel 1 Current min INT Α Read Conversion: value * 1.5 / 32768 Limits [DEFAULT]: RL/0.003 YL/0.05 YH/0.3 RH/0.4 Limits Response: Slacklimitresponse RC_EPS_GEN_4_PNL_1_CURRENT_MAX Panel 1 Current max 256 16 INT Α Read Conversion: value * 1.5 / 32768 Limits [DEFAULT]: RL/0.003 YL/0.05 YH/0.3 RH/0.4 Limits Response: Slacklimitresponse RC_EPS_GEN_4_PNL_1_CURRENT_AVG 272 16 INT Α Panel 1 Current avg Read Conversion: value * 1.5 / 32768 RL/0.003 YL/0.05 YH/0.3 RH/0.4 Limits [DEFAULT]: Limits Response: Slacklimitresponse

AMSAT RC_EPS_GEN_5

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Ti	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Ti string)	ime (Local time zone, Formatted	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rece	eived count	0	0	DERIVED		

		5					
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized	CAN message (a	always 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type Id Value: 128	for CAN		16	16	UINT	
TAG	NOT USED in currer hardware/software.	nt PCAN-Etherne	et Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the Co		microseconds. This is	96	32	UINT	
TIMESTAMP_H	Timestamp of the Co		microseconds. This is	128	32	UINT	
CHANNEL	NOT USED in currer hardware/software.					UINT	
DLC	Date Length Count from the CAN message.				8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.				16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.				1	UINT	
CANID_RTR	RTR value.				1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823124			195	29	UINT	
	State Value						
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_5_PNL_2_CURRENT_MIN	Panel 2 Current min			224	16	INT	A
	Read Conversion:	value * 1.5 / 3	32768				
	Limits [DEFAULT]:		0.05 YH/0.45 RH/0.6				
	Limits Response:	Slacklimitrespo	onse				
RC_EPS_GEN_5_PNL_2_CURRENT_MAX	Panel 2 Current max	<		240	16	INT	А
	Read Conversion:	value * 1.5 / 32768					
	Limits [DEFAULT]:	RL/0.003 YL/0	0.05 YH/0.45 RH/0.6				
	Limits Response: Slacklimitresponse						
RC_EPS_GEN_5_PNL_2_CURRENT_AVG Panel 2 Current avg				256 1	16	INT	A
Read Conversion: value * 1.5 / 3276	32768						
	Limits [DEFAULT]: RL/0.003 YL/0.05 YH/0.45 RH/0.6						
	Limits Response:	Slacklimitrespo	onse				
		Sidenii ilidesponse					



RC_EPS_GEN_5_PNL_3_CURRENT_MIN	Panel 3 Current min	Panel 3 Current min			INT	А
	Read Conversion:	Read Conversion: value * 1.5 / 32768				
	Limits [DEFAULT]:	RL/0.003 YL/0.05 YH/0.3 RH/0.4				
	Limits Response:	Slacklimitresponse				

AMSAT RC_EPS_GEN_6

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)	0	0	0 DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.		8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		



CANID_PADDING	Fixed value of 0 - res	ixed value of 0 - reserved.				UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether th frame.	e message is a	standard or extended	194	1	UINT	
CANID_ID	The ID (normal or exheaders. Id Value: 307823:		n of the 'CAN ID' set of	195	29	UINT	
	State						
	EXTENDED						
	STANDARD		0				
RC_EPS_GEN_6_PNL_3_CURRENT_MAX	Panel 3 Current max	Panel 3 Current max			16	INT	A
	Read Conversion:	value * 1.5 / 3	32768				
	Limits [DEFAULT]:	RL/0.003 YL/	0.05 YH/0.3 RH/0.4				
	Limits Response:	Slacklimitrespo	onse				
RC_EPS_GEN_6_PNL_3_CURRENT_AVG	Panel 3 Current avg			240	16	INT	Α
	Read Conversion:	value * 1.5 / 3	32768				
	Limits [DEFAULT]:	RL/0.003 YL/	0.05 YH/0.3 RH/0.4				
	Limits Response:	Slacklimitrespo	onse				
RC_EPS_GEN_6_PNL_1_POWER_MIN	Panel 1 Current min			256	16	INT	W
	Read Conversion:	value * 3 / 3	276.8				
	Limits [DEFAULT]:	RL/0.06 YL/	1.0 YH/3.0 RH/4.0				
	Limits Response:	Slacklimitresp	oonse				
RC_EPS_GEN_6_PNL_1_POWER_MAX	Panel 1 Current max			272	16	INT	W
	Read Conversion:	Read Conversion: value * 3 / 3276.8					
	Limits [DEFAULT]: RL/0.06 YL/1.0 YH/3.0 RH/4.0						
	Limits Response:	Slacklimitresp	oonse				

AMSAT RC_EPS_GEN_7

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string) 0	0	DERIVED		

	Read Conversion:	PacketTimeFor	rmattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (UTC, Floatir	ng point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeS	SecondsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ne (Local time z	cone, Formatted string)	0	0	DERIVED	
	Read Conversion:	ead Conversion: ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	OSMOS packet received count				DERIVED	
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized C	ength of TCP-ized CAN message (always 36/0x24 bytes)					
FIXED_TYPE	Fixed message type for Id Value: 128	rixed message type for CAN				UINT	
TAG	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAI lower 4 bytes of the t		nicroseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAI upper 4 bytes of the		nicroseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	160	8	UINT	
DLC	Date Length Count fr	om the CAN me	essage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	PCAN-Ethernet	Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the frame.	message is a st	andard or extended	194	1	UINT	
CANID_ID	The ID (normal or ext headers. Id Value: 3078231		of the 'CAN ID' set of	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_7_PNL_1_POWER_AVG	Panel 1 Current avg	224	16	INT	W		
	Read Conversion:	value * 3 / 32	276.8				
	Limits [DEFAULT]:	RL/0.06 YL/1	.0 YH/3.0 RH/4.0				
	Limits Response:	Slacklimitresp	onse				



RC_EPS_GEN_7_PNL_2_POWER_MIN Panel 2 Current min 240 16 INT W Read Conversion: value * 3 / 3276.8 Limits [DEFAULT]: RL/0.06 YL/1.0 YH/6.0 RH/7.0 Limits Response: Slacklimitresponse RC_EPS_GEN_7_PNL_2_POWER_MAX Panel 2 Current max 256 16 INT W Read Conversion: value * 3 / 3276.8 Limits [DEFAULT]: RL/0.06 YL/1.0 YH/6.0 RH/7.0 Limits Response: Slacklimitresponse 272 16 INT RC_EPS_GEN_7_PNL_2_POWER_AVG Panel 2 Current avg Read Conversion: value * 3 / 3276.8 Limits [DEFAULT]: RL/0.06 YL/1.0 YH/6.0 RH/7.0 Limits Response: Slacklimitresponse

AMSAT RC_EPS_GEN_8

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Tim	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Tim	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received T	Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received T	Fime (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet rec	eived count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized (CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type Id Value: 128	for CAN	16	16	UINT		
TAG	NOT USED in curren hardware/software.	t PCAN-Ethernet Gateway DR	32	64	UINT		
	•						

llite Lab							
TIMESTAMP_L	Timestamp of the Colower 4 bytes of the		nicroseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the Coupper 4 bytes of the		nicroseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	160	8	UINT	
DLC	Date Length Count	from the CAN me	essage.	168	8	UINT	
FLAGS	NOT USED in current hardware/software.	t PCAN-Ethernet	Gateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - re	Fixed value of 0 - reserved.			1	UINT	
CANID_RTR	RTR value.				1	UINT	
CANID_TYPE				194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823127			195	29	UINT	
	State Value						
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_8_PNL_3_POWER_MIN	Panel 3 Current min			224	16	INT	W
	Read Conversion: value * 3 / 3276.8						
	Limits [DEFAULT]: RL/0.06 YL/1.0 YH/3.0 RH/4.0						
	Limits Response: Slacklimitresponse						
RC_EPS_GEN_8_PNL_3_POWER_MAX	Panel 3 Current max	(240	16	INT	W
	Read Conversion:	value * 3 / 3	276.8				
	Limits [DEFAULT]:		0 YH/3.0 RH/4.0				
	Limits Response:	Slacklimitresp					
RC_EPS_GEN_8_PNL_3_POWER_AVG	Panel 3 Current avg			256	16	INT	W
	Read Conversion:	value * 3 / 3	276.8				
	Limits [DEFAULT]:	RL/0.06 YL/1	0 YH/3.0 RH/4.0				
	Limits Response:	Slacklimitresp	oonse				
RC_EPS_GEN_8_PNL_1_TEMP_MIN	Panel 1 Temp min			272	8	INT	С
	Read Conversion:	value - 50					
	Limits [DEFAULT]:		.5 YH/23.0 RH/25.0				
	Limits Response:						
PADDING	Padded bits for CAN	data		280	8	UINT	



AMSAT RC_EPS_GEN_9

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)) 0	0	DERIVED		%0.6f
	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted strin	g) 0	0	DERIVED		
	Read Conversion: ReceivedTimeFormattedConversion	1				
RECEIVED_COUNT	COSMOS packet received count	0	0	DERIVED		
	Read Conversion: ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128	16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is to lower 4 bytes of the timestamp.	:he 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is tupper 4 bytes of the timestamp.	the 128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	160	8	UINT		
DLC	Date Length Count from the CAN message.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.	192	1	UINT		
CANID_RTR	RTR value.	193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set o headers. Id Value: 307823128	f 195	29	UINT		

	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_EPS_GEN_9_PNL_1_TEMP_MAX	Panel 1 Temp max			224	8	INT	С
	Read Conversion:						
	Limits [DEFAULT]:	RL/17.0 YL/19.	5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespon	se				
RC_EPS_GEN_9_PNL_1_TEMP_AVG	Panel 1 Temp avg			232	8	INT	С
	Read Conversion:	value - 50					
	Limits [DEFAULT]:		5 YH/23.0 RH/25.0				
		Slacklimitrespon					
	Limits Response:	Siackiimitrespor	se				
RC_EPS_GEN_9_PNL_2_TEMP_MIN	Panel 2 Temp min					INT	С
	Read Conversion: value - 50						
	Limits [DEFAULT]:	RL/17.0 YL/19.	5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespon	se				
RC_EPS_GEN_9_PNL_2_TEMP_MAX	Panel 2 Temp max			248	8	INT	С
	Read Conversion: value - 50						
	Limits [DEFAULT]:	RL/17.0 YL/19.	5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespon	se				
RC_EPS_GEN_9_PNL_2_TEMP_AVG	Panel 2 Temp avg			256	8	INT	С
	Read Conversion:	value - 50					
	Limits [DEFAULT]:	RL/17.0 YL/19.	5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespon					
RC_EPS_GEN_9_PNL_3_TEMP_MIN	Panel 3 Temp min			264	8	INT	С
	Read Conversion:	value - 50					
	Limits [DEFAULT]:	RL/17.0 YL/19.	5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespor	se				
RC_EPS_GEN_9_PNL_3_TEMP_MAX	Panel 3 Temp max			272	8	INT	С
NO_LI				212	U	71 // 1	C
	Read Conversion:	value - 50	E VILVOO O BLUOT O				
	Limits [DEFAULT]:		5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitrespon	se				



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Date: 11/30/2018

RC_EPS_GEN_9_PNL_3_TEMP_AVG	Panel 3 Temp avg		280	8	INT	С
	Read Conversion:	value - 50				
	Limits [DEFAULT]:	s [DEFAULT]: RL/17.0 YL/19.5 YH/23.0 RH/25.0				
	Limits Response:	Slacklimitresponse				

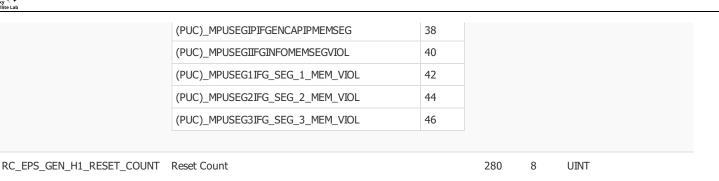
AMSAT RC_EPS_GEN_H1

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UTC	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pa	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Loc	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pac	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ime (U	ITC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Red	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ime (Le	ocal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Rec	reivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	eived c	count	0	0			
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	CAN me	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	for CA	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		ssage, in microseconds. This is the amp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		ssage, in microseconds. This is the tamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	: PCAN	N-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count fro	rom th	ne CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		



CANID_TYPE	Indicates whether the	e message is a standa	rd or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or ex headers. Id Value: 3088717	e 'CAN ID' set of	195	29	UINT		
	State Value						
	EXTENDED	1					
	STANDARD	0					
RC_EPS_GEN_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.0 Y	H/30.0 RH/35.0				
	Limits Response:	Slacklimitresponse					
RC_EPS_GEN_H1_TEMP_MAX	Temperature of MSP			240	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.0 Y	H/30.0 RH/35.0				
	Limits Response:	Slacklimitresponse					
DO EDG CEN LIA TEMP AVG	T			256	1.0	TA 1-T	
RC_EPS_GEN_H1_TEMP_AVG	Temperature of MSP			256	16	INT	С
	Read Conversion: value / 100.0						
	Limits [DEFAULT]:						
	Limits Response:	Slacklimitresponse					
RC_EPS_GEN_H1_SYSRSTIV	Reason for reset			272	8	UINT	
	State		Value				
	NO_INTERRUPT_PE	ENDING	0				
	(BOR)_BROWNOUT		2				
	(BOR)_RSTIFG_RST	/NMI	6				
	(BOR)_LPMX.5_WAI	KE_UP	8				
	(BOR)_SECURITY_V	/IOLATION	10				
	(BOR)_SVSHIFG_SV	SH_EVENT	14				
	(POR)_PMMSWPOR	_SOFTWARE_POR	20				
	(PUC)_WDTIFG_WA	ATCHDOG_TIMEOUT	22				
	(PUC)_WDTPW_PA	SSWORD_VIOLATIO	N 24				
	(PUC)_FRCTLPW_P	ASSWORD_VIOLATION	ON 26				
	(PUC)_UNCORRECT	ABLE_FRAM_BIT_ER	R 28				
	(PUC)_PERIPHERAL	_AREA_FETCH	30				
	(PUC)_PMMPW_PMI	M_PWD_VIOLATION	32				
	(PUC)_MPUPW_MPU	U_PWD_VIOLATION	34				
	(PUC)_MPUPW_MPU_PWD_VIOLATION 34						





AMSAT RC_EPS_GEN_H2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating p	oint, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: PacketTimeSe	econdsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone	, Formatted string)	0	0	DERIVED		
	Read Conversion: PacketTimeFor	rmattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating	point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Received Times	SecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zo	ne, Formatted string)	0	0	DERIVED		
	Read Conversion: ReceivedTimeF	ormattedConversion					
RECEIVED_COUNT	COSMOS packet received count		0	0	DERIVED		
	Read Conversion: Received Co	ountConversion					
LENGTH	Length of TCP-ized CAN message (always	ays 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128		16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Chardware/software.	Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in miclower 4 bytes of the timestamp.	croseconds. This is the	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in mic upper 4 bytes of the timestamp.	croseconds. This is the	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet of hardware/software.	Gateway DR	160	8	UINT		
DLC	Date Length Count from the CAN mes	sage.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet of hardware/software.	Gateway DR	176	16	UINT		



CANID_PADDING	Fixed value of 0 - reserved.		192	1	UINT	
CANID_RTR	RTR value.	R value.			UINT	
CANID_TYPE	Indicates whether the message is a stan	dard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of headers. Id Value: 308871784					
	State	Value				
	EXTENDED	1				
	STANDARD	0				
RC_EPS_GEN_H2_CANRXERROR	GEN MCP's RX error buffer		224	8	UINT	

232

56

UINT

AMSAT RC_PPT_1

Padded bits for CAN data

PADDING

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UT	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	F	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	P	acketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	ime (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	R	eceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	ime (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Re	eceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet recei	eived	count	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CA	:AN n	nessage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	for C	AN	16	16	UINT		
TAG	NOT USED in current hardware/software.	IOT USED in current PCAN-Ethernet Gateway DR				UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		essage, in microseconds. This is the stamp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN	N me	essage, in microseconds. This is the	128	32	UINT		



	upper 4 bytes of the timestamp.						
CHANNEL	NOT USED in current PCAN-Ether hardware/software.	rnet Ga	ateway DR	160	8	UINT	
DLC	Date Length Count from the CAN	l messa	age.	168	8	UINT	
FLAGS	NOT USED in current PCAN-Ether hardware/software.	rnet Ga	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the message is	icates whether the message is a standard or extended frame.					
CANID_ID	The ID (normal or extended) por headers. Id Value: 307823112						
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_PPT_1_FIRE_COUNT	Total number of times the PPT ha	as fired		224	16	UINT	
RC_PPT_1_FAULT_COUNT	PPT fault count			240	16	UINT	
RC_PPT_1_LAST_MAIN_CHARGE	Main Charge Time Average			256	16	UINT	S
	Read Conversion:	value	* 2.0**-15				
RC_PPT_1_SMT_WAIT_TIME	None			272	16	UINT	S
	Read Conversion:	value	* 2.0**-15				

AMSAT RC_PPT_2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	(UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	(Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tin	ne (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tin	ne (Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeFormattedConversion					

RECEIVED_COUNT	COSMOS packet receiv	ed count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	ountConversion				
LENGTH	Length of TCP-ized CAI		ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for Id Value: 128	CAN		16	16	UINT	
TAG	NOT USED in current P hardware/software.	CAN-Ethernet G	ateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the tin		roseconds. This is the	96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the timestamp.		roseconds. This is the	128	32	UINT	
CHANNEL	NOT USED in current P hardware/software.	CAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count fro	m the CAN mess	sage.	168	8	UINT	
FLAGS	NOT USED in current Phardware/software.					UINT	
CANID_PADDING	Fixed value of 0 - reser	xed value of 0 - reserved.				UINT	
CANID_RTR	RTR value.	193	1	UINT			
CANID_TYPE	Indicates whether the r	nessage is a star	ndard or extended frame.	194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 307823113				29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC PPT 2 MAIN CHARGE TIME	None			224	16	UINT	S
	Read Conversion:	value	* 2.0**-15				
RC_PPT_2_MAIN_IGN_DELAY	None			240	16	UINT	S
	Read Conversion:	value	2* 2.0**-15				
RC_PPT_2_IGN_CHARGE_TIME	None	None			16	UINT	S
	Read Conversion:	Read Conversion: value * 2.0**-15					
RC_PPT_2_COOLDOWN_TIME	None			272	16	UINT	S
	Read Conversion:	value	2* 2.0**-15				



AMSAT RC_PPT_3

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC, Floating point	, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSeco	ondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time ((Local time zone, Fo	rmatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeForm	attedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tim	e (UTC, Floating po	int, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	ReceivedTimeSec	condsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tim	e (Local time zone,	Formatted string)	0	0	DERIVED		
	Read Conversion:	ReceivedTimeForm	mattedConversion					
RECEIVED_COUNT	COSMOS packet receiv	ed count		0	0	DERIVED		
	Read Conversion:	ReceivedCou	ntConversion					
LENGTH	Length of TCP-ized CAI	N message (always	36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN		16	16	UINT		
TAG	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN bytes of the timestamp		econds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN 4 bytes of the timestan		econds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	160	8	UINT		
DLC	Date Length Count fro	m the CAN message	е.	168	8	UINT		
FLAGS	NOT USED in current P hardware/software.	CAN-Ethernet Gate	way DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reser	ved.		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the r	ndicates whether the message is a standard or extended frame.						
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers Id Value: 307823114				29	UINT		
	State		Value					
	EXTENDED		1					



	STANDARD	0			
PADDING	Padded bits for CAN data		224	64	UINT

AMSAT RC_PPT_H1

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (I	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	PacketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time	e (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Read Conversion: ReceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	OSMOS Received Time (Local time zone, Formatted string)					
	Read Conversion:	ReceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	I message (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN	16	16	UINT		
TAG	NOT USED in current Po	CAN-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN r	message, in microseconds. This is the lower	1 96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN r 4 bytes of the timestam	message, in microseconds. This is the upper p.	128	32	UINT		
CHANNEL	NOT USED in current Ponardware/software.	CAN-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count from	n the CAN message.	168	8	UINT		
FLAGS	NOT USED in current Pontardware/software.	CAN-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserv	red.	192	1	UINT		
CANID_RTR	RTR value.		193	1	UINT		
CANID_TYPE	Indicates whether the m	nessage is a standard or extended frame.	194	1	UINT		



	Id Value: 3088717		e 'CAN ID' set of headers.	195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
RC_PPT_H1_TEMP_MIN	Temperature of MSP			224	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:		YH/30.0 RH/35.0				
	Limits Response:		Slacklimitresponse				
OC DET 114 TEMP MAY	T	emperature of MSP					-
RC_PPT_H1_TEMP_MAX					16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:		YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespons	2				
RC_PPT_H1_TEMP_AVG	Temperature of MSP			256	16	INT	С
	Read Conversion:	value / 100.0					
	Limits [DEFAULT]:	RL/15.0 YL/20.0	YH/30.0 RH/35.0				
	Limits Response:	Slacklimitrespons	е				
DO DDT III GVCDCTIV	D 6 1			272			
RC_PPT_H1_SYSRSTIV	Reason for reset		Value	272	8	UINT	
	State NO INTERRUPT DE	NDING	Value 0				
	NO_INTERRUPT_PEI	NDING	2				
	(BOR)_RSTIFG_RST/	'NMT	6				
	(BOR)_LPMX.5_WAK		8				
	(BOR)_SECURITY_V		10				
	(BOR) SVSHIFG SVS	R)_SVSHIFG_SVSH_EVENT					
	(BOR)_SVSHIFG_SVS		14 20				
		_SOFTWARE_POR					
	(POR)_PMMSWPOR_	SOFTWARE_POR	20 22				
	(POR)_PMMSWPOR_ (PUC)_WDTIFG_WA	SOFTWARE_POR TCHDOG_TIMEOUT SSWORD_VIOLATIO	20 22 N 24				
	(PUC)_WDTIFG_WA	SOFTWARE_POR TCHDOG_TIMEOUT SSWORD_VIOLATION ASSWORD_VIOLATION	20 22 N 24 DN 26				
	(PUC)_WDTIFG_WA (PUC)_WDTPW_PAS (PUC)_FRCTLPW_PAS	SOFTWARE_POR TCHDOG_TIMEOUT SWORD_VIOLATION ASSWORD_VIOLATION ABLE_FRAM_BIT_ER	20 22 N 24 DN 26				
	(PUC)_WDTIFG_WA (PUC)_WDTPW_PAS (PUC)_FRCTLPW_PAS (PUC)_UNCORRECTA	SOFTWARE_POR TCHDOG_TIMEOUT SSWORD_VIOLATION ASSWORD_VIOLATION ABLE_FRAM_BIT_ER AREA_FETCH	20 22 N 24 DN 26 R 28				
	(PUC)_PMMSWPOR_ (PUC)_WDTIFG_WA (PUC)_WDTPW_PAS (PUC)_FRCTLPW_PAS (PUC)_UNCORRECTATION (PUC)_PERIPHERAL_	SOFTWARE_POR TCHDOG_TIMEOUT SWORD_VIOLATION ASSWORD_VIOLATION ABLE_FRAM_BIT_ER AREA_FETCH I_PWD_VIOLATION	20 22 N 24 DN 26 R 28				
	(PUC)_PMMSWPOR_ (PUC)_WDTIFG_WA (PUC)_WDTPW_PAS (PUC)_FRCTLPW_PA (PUC)_UNCORRECTA (PUC)_PERIPHERAL_ (PUC)_PMMPW_PMM	SOFTWARE_POR TCHDOG_TIMEOUT SSWORD_VIOLATION ASSWORD_VIOLATION ASSWORD_VIOLATION LPWD_VIOLATION	20 22 N 24 ON 26 R 28 30 32 34				
	(PUC)_PMMSWPOR_ (PUC)_WDTIFG_WA (PUC)_WDTPW_PAS (PUC)_FRCTLPW_PAS (PUC)_UNCORRECTAS (PUC)_PERIPHERAL_ (PUC)_PMMPW_PMN (PUC)_MPUPW_MPU	SOFTWARE_POR TCHDOG_TIMEOUT SSWORD_VIOLATION ASSWORD_VIOLATION LPWD_VIOLATION ASSWORD_VIOLATION ASSWORD_VIOLATION	20 22 N 24 ON 26 R 28 30 32 34				



	(PUC)_MPUSEG1IFG_SEG_1_MEM_VIOL	42			
	(PUC)_MPUSEG2IFG_SEG_2_MEM_VIOL	44			
	(PUC)_MPUSEG3IFG_SEG_3_MEM_VIOL	46			
RC_PPT_H1_RESET_COUNT	None		280	8	UINT

AMSAT RC_PPT_H2

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time	e (UT0	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Pa	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time	e (Loc	al time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Tir	me (L	JTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Tir	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED		
	Read Conversion:	Read Conversion: ReceivedTimeFormattedConversion						
RECEIVED_COUNT	COSMOS packet recei	COSMOS packet received count		0	0	DERIVED		
	Read Conversion:	Read Conversion: ReceivedCountConversion						
LENGTH	Length of TCP-ized CA	AN m	essage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	or CA	N	16	16	UINT		
TAG	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN lower 4 bytes of the ti		ssage, in microseconds. This is the camp.	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN upper 4 bytes of the t		ssage, in microseconds. This is the tamp.	128	32	UINT		
CHANNEL	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	160	8	UINT		
DLC	Date Length Count from	rom tl	he CAN message.	168	8	UINT		
FLAGS	NOT USED in current hardware/software.	PCAN	N-Ethernet Gateway DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - rese	erved		192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		



CANID_TYPE	Indicates whether the message is a star	ndard or extended frame.	194	1	UINT
CANID_ID	The ID (normal or extended) portion or headers. Id Value: 308871782	195	29	UINT	
	State Value EXTENDED 1				
	STANDARD	0			
RC_PPT_H2_CANRXERROR	the PPT MCP's RX error buffer		224	8	UINT
RC_PPT_H2_LAST_FIRE_RESULT	The result of the last PPT fire			2	UINT
	State	Value			
	FIRE_SUCCESSFUL	0			
	NO_MAIN_CHARGE	1			
	NO_MAIN_DISCHARGE 2				
PADDING	Padded bits for CAN data		234	54	UINT

AMSAT SENSORPROC_IMU

Item Name	Description			Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time ((UTC	, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion:	P	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED COSMOS Packet Time (Local time zone, Formatted string)				0	0	DERIVED		
	Read Conversion:	Pa	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	ECEIVED_TIMESECONDS COSMOS Received Time (UTC, Floating point, Unix epoch)					DERIVED		%0.6f
	Read Conversion:	Re	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time	e (Lo	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion:	Red	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet receive	ed co	punt	0	0	DERIVED		
	Read Conversion:		ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN	N me	ssage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for Id Value: 128	CAN	I	16	16	UINT		
	Fixed message type for							



TAG	NOT USED in current PCAN-Ethe hardware/software.	ernet Gate	way DR	32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, bytes of the timestamp.	in microse	econds. This is the lower 4	96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, 4 bytes of the timestamp.	in microse	econds. This is the upper	128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethe hardware/software.	ernet Gate	way DR	160	8	UINT		
DLC	Date Length Count from the CAI	N message	e.	168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethe hardware/software.	ernet Gate	way DR	176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the message is	s a standa	rd or extended frame.	194	1	UINT		
CANID_ID	The ID (normal or extended) por Id Value: 335872066	195	29	UINT				
	State V		Value					
	EXTENDED		1					
	STANDARD		0					
SENSORPROC_IMU_X	Sun Angle x			224	16	INT	deg/s	%0.2f
	Read Conversion:	value *	0.004375					
SENSORPROC_IMU_Y	Sun Angle y			240	16	INT	deg/s	%0.2f
	Read Conversion:	value *	0.004375					
SENSORPROC_IMU_Z	Sun Angle z			256	16	INT	deg/s	%0.2f
	Read Conversion:	value *	0.004375					
SENSORPROC_IMU_VALID	Sun Angle Validity			272	1	UINT		
	State	Value						
	FALSE	0						
	TRUE	1						
PADDING	Padded bits for CAN data			273	15	UINT		

AMSAT SENSORPROC_MAG

Item Name	Description	Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)	0	0	DERIVED		%0.6f

	Read Conversion:	PacketTimeSec	condsConversion				
PACKET_TIMEFORMATTED	COSMOS Packet Time (L	ocal time zone,	Formatted string)	0	0	DERIVED	
	Read Conversion:	PacketTimeForm	mattedConversion				
RECEIVED_TIMESECONDS	COSMOS Received Time	(UTC, Floating	point, Unix epoch)	0	0	DERIVED	%0.6f
	Read Conversion:	ReceivedTimeSo	econdsConversion				
RECEIVED_TIMEFORMATTED	COSMOS Received Time	(Local time zor	ne, Formatted string)	0	0	DERIVED	
	Read Conversion: R	ReceivedTimeFo	rmattedConversion				
RECEIVED_COUNT	COSMOS packet receive	d count		0	0	DERIVED	
	Read Conversion:	ReceivedCo	untConversion				
LENGTH	Length of TCP-ized CAN	message (alwa	ys 36/0x24 bytes)	0	16	UINT	
FIXED_TYPE	Fixed message type for	CAN		16	16	UINT	
	Id Value: 128						
TAG	NOT USED in current PC hardware/software.	CAN-Ethernet G	ateway DR	32	64	UINT	
TIMESTAMP_L	Timestamp of the CAN n	nessage in mici	roseconds. This is the	96	32	UINT	
72 ES 774 II _E	lower 4 bytes of the time		Tooccomast This State	30	32	0111	
TIMESTAMP_H	Timestamp of the CAN n		roseconds. This is the	128	32	UINT	
	upper 4 bytes of the tim	nestamp.					
CHANNEL	NOT USED in current PC hardware/software.	CAN-Ethernet G	ateway DR	160	8	UINT	
DLC	Date Length Count from	n the CAN mess	2200	168	8	UINT	
FLAGS	NOT USED in current PC hardware/software.	CAN-Ethernet G	ateway DR	176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserv	ed.		192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
		accago is a star	adard or ovtondod	194	1	UINT	
CANID_TYPE	Indicates whether the m frame.	lessage is a stai	idald of exterided	134	1	OIM	
CANID_ID	The ID (normal or exten	ided) portion of	f the 'CAN ID' set of	195	29	UINT	
	headers. Id Value: 335872067	,					
	State		Value				
	EXTENDED		1				
	STANDARD		0				
	J. 11.57 11.5		-				
SENSORPROC_MAG_X	Sun Angle x			224	16	INT	nT
							



	Read Conversion:		value * 73				
SENSORPROC_MAG_Y	Sun Angle y			240	16	INT	nT
	Read Conversion:	Read Conversion: valu					
SENSORPROC_MAG_Z	Sun Angle z			256	16	INT	nT
	Read Conversion:		value * 73				
SENSORPROC_MAG_VALID Sun Angle Validity							
SENSORPROC_MAG_VALID	Sun Angle Validity			272	1	UINT	
SENSORPROC_MAG_VALID	Sun Angle Validity State	Value		272	1	UINT	
SENSORPROC_MAG_VALID		Value	2	272	1	UINT	
SENSORPROC_MAG_VALID	State		2	272	1	UINT	
SENSORPROC_MAG_VALID	State FALSE	0	3	272	1	UINT	
SENSORPROC_MAG_VALID SENSORPROC_MAG_BDOT_VALID	State FALSE	0		272	1	UINT	
	State FALSE TRUE	0	3				

AMSAT SENSORPROC_MAG2

Item Name	Description		Bit Offset	Bit Size	Data Type	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTO	C, Floating point, Unix epoch)	0	0	DERIVED		%0.6f
	Read Conversion: Pa	acketTimeSecondsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Loc	cal time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: Page	cketTimeFormattedConversion					
RECEIVED_TIMESECONDS	COSMOS Received Time (L	COSMOS Received Time (UTC, Floating point, Unix epoch)					%0.6f
	Read Conversion: Red	ceivedTimeSecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (L	Local time zone, Formatted string)	0	0	DERIVED		
	Read Conversion: Rec	ceivedTimeFormattedConversion					
RECEIVED_COUNT	COSMOS packet received of	count	0	0	DERIVED		
	Read Conversion:	ReceivedCountConversion					
LENGTH	Length of TCP-ized CAN m	nessage (always 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CA Id Value: 128	AN	16	16	UINT		
TAG	NOT USED in current PCAP hardware/software.	N-Ethernet Gateway DR	32	64	UINT		



TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT	
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT	
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			160	8	UINT	
DLC	Date Length Count from the CAN message.			168	8	UINT	
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT	
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT	
CANID_RTR	RTR value.			193	1	UINT	
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT	
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 335872068			195	29	UINT	
	State		Value				
	EXTENDED		1				
	STANDARD		0				
SENSORPROC_MAG2_X	None		224	16	INT	nT	
	Read Conversion:		value * 73				
SENSORPROC_MAG2_Y	None		240	16	INT	nT	
	Read Conversion:		value * 73				
SENSORPROC_MAG2_Z	None		256	16	INT	nT	
	Read Conversion:		value * 73				
SENSORPROC_MAG2_VALID	None			272	1	UINT	
	State Value						
	FALSE 0						
	TRUE	1					
SENSORPROC_MAG2_BDOT_VALID	Whether the reading is valid for bdot			273	1	UINT	

AMSAT SENSORPROC_SUN

Bit Bit Data



Item Name	Description			Offset	Size	Туре	Units	Format
PACKET_TIMESECONDS	COSMOS Packet Time (UTC, Floating point, Unix epoch)			0	0	DERIVED		%0.6f
	Read Conversion:	PacketTimeS	econdsConversion					
PACKET_TIMEFORMATTED	COSMOS Packet Time (Local time zone, Formatted string)			0	0	DERIVED		
	Read Conversion: PacketTimeFormattedConversion							
RECEIVED_TIMESECONDS	COSMOS Received Time (UTC, Floating point, Unix epoch)		0	0	DERIVED		%0.6f	
	Read Conversion:	ReceivedTime	SecondsConversion					
RECEIVED_TIMEFORMATTED	COSMOS Received Time (Local time zone, Formatted string)		0	0	DERIVED			
	Read Conversion:	ReceivedTimeF	FormattedConversion					
RECEIVED_COUNT	COSMOS packet received count			0	0	DERIVED		
	Read Conversion:	ReceivedC	CountConversion					
LENGTH	Length of TCP-ized CAI	N message (alwa	ys 36/0x24 bytes)	0	16	UINT		
FIXED_TYPE	Fixed message type for CAN Id Value: 128			16	16	UINT		
TAG	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			32	64	UINT		
TIMESTAMP_L	Timestamp of the CAN message, in microseconds. This is the lower 4 bytes of the timestamp.			96	32	UINT		
TIMESTAMP_H	Timestamp of the CAN message, in microseconds. This is the upper 4 bytes of the timestamp.			128	32	UINT		
CHANNEL	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			160	8	UINT		
DLC	Date Length Count from the CAN message.			168	8	UINT		
FLAGS	NOT USED in current PCAN-Ethernet Gateway DR hardware/software.			176	16	UINT		
CANID_PADDING	Fixed value of 0 - reserved.			192	1	UINT		
CANID_RTR	RTR value.			193	1	UINT		
CANID_TYPE	Indicates whether the message is a standard or extended frame.			194	1	UINT		
CANID_ID	The ID (normal or extended) portion of the 'CAN ID' set of headers. Id Value: 335872065			195	29	UINT		
	State		Value					
	EXTENDED		1					
	STANDARD		0					
SENSORPROC_SUN_X	Sun Angle x			224	16	INT		



SENSORPROC_SUN_Y	Sun Angle y		240	16	INT
SENSORPROC_SUN_Z	Sun Angle z		256	16	INT
SENSORPROC_SUN_VALID	Sun Angle Validity		272	1	UINT
	State	Value			
	FALSE	0			
	TRUE	1			
PADDING	Padded bits for CAN data		273	15	UINT