DIT		ink_Header_(IBL)	W 1 2	 
BIT	Word 0	Word 1	Word 2	Word 3
31				
30	В	Е	0	0
29	D	L		v
28				
27				
26	0	Е	0	3
25	U	L	U	3
24				
23				
22	F	1	0	0
21	Γ	1	U	U
20				
19				
18	0	2		1
17	0	2	0	1
16				
15				
14				0
13	0	3	0	0
12				
11				
10				
9	0	4	0	0
8				
7				
6				
5	0	Е	0	0
4				
3				
2				
1	0	E	9	0
0				
Legend		Hard-coded		
Degena		E		

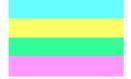
From register From TIM BL S-Link\_Header\_(IBL)

Word 4	Word 5	Word 6	Word 7	Word 8	Word 9
			0	0	0
			0	0	0
			0	0	0
Source ID			0	0	Rod Event Type
	Run number	Ext L1ID	0	0	0
				0	0
			BCID	ATLAS Event	0
Slave ID EFB ID				Туре	0 0 Tim Event Type

### S-Link\_Trailer\_(IBL)

BIT

Legend



### **ERROR COUNT**

Word 0	
FE triple redundant mismatch	
FE data bus address error	
FE SEU upset detected in command decoder	
FE command decoder error	
FE address error	
FE write register data error	
FE triple redundant mismatch	
FE readout processor error	
FE L1_in counter error, L1 request error, L1 register error, L1 trigger ID error	
FE Hamming code error in word0, word1, word2	
FE BCID counter error	
there are skipped triggers in the FE	
row/column error	
raw data	
preamble error in the FE	
non sequential order between the FEs data	
<b>0</b>	
<b>0</b>	
0	
Header trailer limit error	
Trailer timeout error	
logical OR of bits 15 and 14	
logical OR of bits 31 downto 14	
timeout error	
llid error	
beid error	
ocia citoi	

Hard-coded From Rod Logic From Module From TIM

<sup>= (</sup>non sequential order) + (raw data) + (11id err **OR** beid err **OR** trailer TO err **OR** row/col err **OR** skipped triggers) + To

S-Link Trailer (IBL)

Word 1	Word 2	Word 3	Word 4	Word 5
0	0	0	0	E
0	0	0	0	0
0	0	0	0	F
0 0 BOC clock error Tim clock error	0	0	0	0
0	0	0	0	0
	0		0	0
Error count*	0	Word count	0	0
	2		1	0

eamble err + L1ID error + BCID err + Trailer TO err + HT limit err + row/col err + FE error + TO err ------ sum ove

er each module

Module\_(IBL)

#### IBL

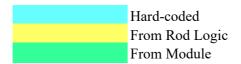
### NORMAL

	Header	HIT	FE FLAG	Trailer
31-29	001	100	000	010
28	Slave ID	Slave ID	Slave ID	Slave ID
27	efb ID	efb ID	efb ID	efb ID
26	formatter ID	formatter ID	formatter ID	formatter ID
25	n	n	n	n
24	n	n	n	n
23	F	Т	0	Е
22	L	Т	S	V
21	L	T	S	P
20	L	T	S	р
19	L	T	S	1
18	L	T	S	b
17	L	Т	S	Z
16	L	Т	0	h
15	L	C	0	V
14	L	C	0	M
13	L	C	0	M
12	L	C	0	M
11	L	C	0	M
10	L	C	0	M
9	В	C	D	M
8	В	R	D	M
7	В	R	D	M
6	В	R	D	M
5	В	R	D	M
4	В	R	D	В
3	В	R	D	В
2	В	R	D	В
1	В	R	D	В
0	В	R	D	В

BIT#		
25-24	n	Fmt internal link number (0-3)
23	F	FEI4 flag
22-10	L	L1ID
9-0	В	BCID
23-16	T	ТоТ
15-9	C	Column
8-0	R	Row
22-17	S	service code
9-0	D	service code counter
23	E	timeout error
22	V	data overflow
21	P	link masked by PPC (not yet implemented)
20	p	Preamble error (bitflip in header)
19	1	L1ID error
18	ь	BCID error
17	Z	Trailer timeout
16	h	Header Trailer limit error
15	V	row/column error

### BAD

Header	Trailer
001	010
Slave ID	Slave ID
efb ID	efb ID
formatter ID	formatter ID
n	n
n	n
0	1
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
В	В
A	A
D	D



BIT	S-Link Word 0	_Header_(Pixel) Word 1	Word 2	PIX Word 3
31 30 29 28	В	E	0	0
27 26 25 24	0	E	0	3
23 22 21 20	F	1	0	0
19 18 17 16	0	2	0	1
15 14 13 12	0	3	0	0
11 10 9 8	0	4	0	0
7 6 5 4	0	E	0	0
3 2 1 0	0	E	9	0
Legend		Hard-coded From register From TIM		

KELS-Link\_Header\_(Pixel)

Word 4	Word 5	Word 6	Word 7	Word 8	Word 9
			0	0	0
			0	0	0
			0	0	0
Source ID	D. I	E (LIII)	0	0	Rod Event Type
	Run number	Ext L1ID	0	0	0
				0	0
Slave ID			BCID	ATLAS Event	0
Source ID				Туре	0 0 Tim Event Type

S-Link\_Trailer\_(Pixel) PIXEL

BIT Word 0

NORMAL	
31	L1CHKFAILGLOBAL
30	BCIDCHKFAIL
29	L1CHKFAILFE
28	EOEOVERFLOW
27	HITOVERFLOW
26	BITFLIP
25	HITPARITY
24	REGPARITY
23	HAMMINGCODE
22	EOCOVERFLOW
21	0
20	row/column error
19	raw data
18	preamble error
17	0
16	header trailer limit error
15	
14	0
13	U
12	
11	
10	0
9	U
8	
7	0
6	0
5	Trailer error (always '0')
4	0
3	0
2	timeout error
1	llid error
0	bcid error

Legend Hard-coded
From Rod Logic
From Module
From TIM

**ERROR COUNT** = (preamble error or L1id error or BCID error) + (HT Limit error or

S-Link Trailer (Pixel)

Word 1	Word 2		Word 4	Word 5
0	0	0	0	E
0	0	0	0	0
0	0	0	0	F
0 0 BOC clock error Tim clock error	0	0	0	0
0	0	0	0	0
	0		0	0
Error count*	0	Word count	0	0
	2		1	0

 $Trailer\ TO\ err) + Timeout\ error + raw\ data + Row/col\ error + FE\ error ------ sum\ over\ each\ module$ 

# S-Link\_Trailer\_(Pixel) Word 0

**FAKE TRAILER** 

## Word 1 Word 2 E C

Page 15
---------

Word 3	Vord 3 Word 4	
0	0	E
0	0	0
0	0	F
0	0	0
Word count	0	0
	0	0
	0	0
	1	0

	NORMAL				
	Header	HIT	FE Flag	Trailer	
31-29	001	100	000	010	
28	P	0	1	Z	
27	t	F	F	Н	
26	1	F	F	V	
25	ь	F	F	A	
24	0	F	F	0	
23	0	T	0	0	
22	efb_spin	T	0	0	
21	MCC_num1	T	0	0	
20	MCC num0	T	1	0	
19	0	T	1	0	
18	QUAD_num	T	1	0	
17	MCC_num1	T	1	0	
16	MCC num0	T	1	0	
15	S	0	0	efb_spin	
14	S	0	0	QUAD_num	
13	S	0	0	MCC_num1	
12	S	C	С	MCC num0	
11	L	C	d	0	
10	L	C	e	0	
9	L	C	f	0	
8	L	C	g	0	
7	В	R	q	0	
6	В	R	q	0	
5	В	R	q	0	
4	В	R	q	0	
3	В	R	p	0	
2	В	R	O	QUAD_num	
1	В	R	n	MCC_num1	
0	В	R	m	MCC num0	

Module\_(Pixel)

**PIXEL** 

Legend	P	Preamble error (bitflip in header)	c
	t	timeout error	d
	1	L1ID error	e
	ь	BCID error	f
	S	Skipped Trigger	g
	L	L1ID	q
	В	BCID	p
	F	FEI3 ID	O
	T	ТоТ	n
	C	Column	m
	R	Row	
	Z	Trailer error	
	Н	Header Trailer limit error	
	V	Data overflow error	
	A	Formatter Fifo almost full	