

		S-Link_Header_(IBL)				II
BIT		Word 0	Word 1	Word 2	Word 3	
31		B	E	0	0	
30						
29						
28						
27		0	E	0	3	
26						
25						
24						
23		F	1	0	0	
22						
21						
20						
19		0	2	0	1	
18						
17						
16						
15		0	3	0	0	
14						
13						
12						
11		0	4	0	0	
10						
9						
8						
7		0	E	0	0	
6						
5						
4						
3		0	E	9	0	
2						
1						
0						

Legend		Hard-coded
		From register
		From TIM

BL

S-Link_Header_(IBL)

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

S-Link_Trailer_(IBL)	
BIT	
31	
30	
29	
28	
27	
26	
25	
24	
23	
22	
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	
0	

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
0
0
0
Header trailer limit error Trailer timeout error logical OR of bits 15 and 14
logical OR of bits 31 downto 14 timeout error 11id error bcid error

- Hard-coded
- From Rod Logic
- From Module
- From TIM

= (non sequential order) + (raw data) + (11id err **OR** bcid err **OR** trailer TO err **OR** row/col err **OR** skipped triggers) + T0

er each module

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	T	0	E
22	L	T	S	V
21	L	T	S	P
20	L	T	S	p
19	L	T	S	l
18	L	T	S	b
17	L	T	S	z
16	L	T	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	B	C	D	M
8	B	R	D	M
7	B	R	D	M
6	B	R	D	M
5	B	R	D	M
4	B	R	D	B
3	B	R	D	B
2	B	R	D	B
1	B	R	D	B
0	B	R	D	B

BIT #

25-24	n	Fmt internal link number (0-3)
23	F	FEI4 flag
22-10	L	L1ID
9-0	B	BCID
23-16	T	ToT
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	l	L1ID error
18	b	BCID error
17	z	Trailer timeout
16	h	Header Trailer limit error
15	v	row/column error

14-5 M skipped trigger Module_(IBL)

BAD

Header	Trailer
001 Slave ID	010 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
B	B
A	A
D	D

	Hard-coded
	From Rod Logic
	From Module

BIT

31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0

S-Link_Header_(Pixel)				PIX
Word 0	Word 1	Word 2	Word 3	
B	E	0	0	
0	E	0	3	
F	1	0	0	
0	2	0	1	
0	3	0	0	
0	4	0	0	
0	E	0	0	
0	E	9	0	

Legend

	Hard-coded
	From register
	From TIM

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

BIT

S-Link_Trailer_(Pixel)

PIXEL

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	
12	
11	
10	0
9	
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 L1lid error or BCID error) + (HT Limit error or

S-Link_Trailer_(Pixel)								
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	0	0	0				
0								
BOC clock error Tim clock error	0	0	0	0				
0								
Error count*					0	Word count	0	0
					0		0	0
					0		0	0
					2		1	0

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

FAKE TRAILER

0	E	0
0	C	0
0	0	0
1	0	0
0	0	0
0	0	0
0	0	0
8	0	2

Word 3

Word 4

Word 5

0	0	E
0	0	0
0	0	F
0	0	0
0	Word count	0
		0
		0
		0
	1	0

	Module_(Pixel)			PIXEL
	NORMAL			
	Header	HIT	FE Flag	Trailer
31-29	001	100	000	010
28	P	0	1	Z
27	t	F	F	H
26	l	F	F	V
25	b	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	c	MCC_num0
11	L	C	d	0
10	L	C	e	0
9	L	C	f	0
8	L	C	g	0
7	B	R	q	0
6	B	R	q	0
5	B	R	q	0
4	B	R	q	0
3	B	R	p	0
2	B	R	o	QUAD_num
1	B	R	n	MCC_num1
0	B	R	m	MCC_num0

Legend	P	Preamble error (bitflip in header)
	t	timeout error
	l	L1ID error
	b	BCID error
	S	Skipped Trigger
	L	L1ID
	B	BCID
	F	FEI3 ID
	T	ToT
	C	Column
	R	Row
	Z	Trailer error
	H	Header Trailer limit error
	V	Data overflow error
	A	Formatter Fifo almost full

c
d
e
f
g
q
p
o
n
m
