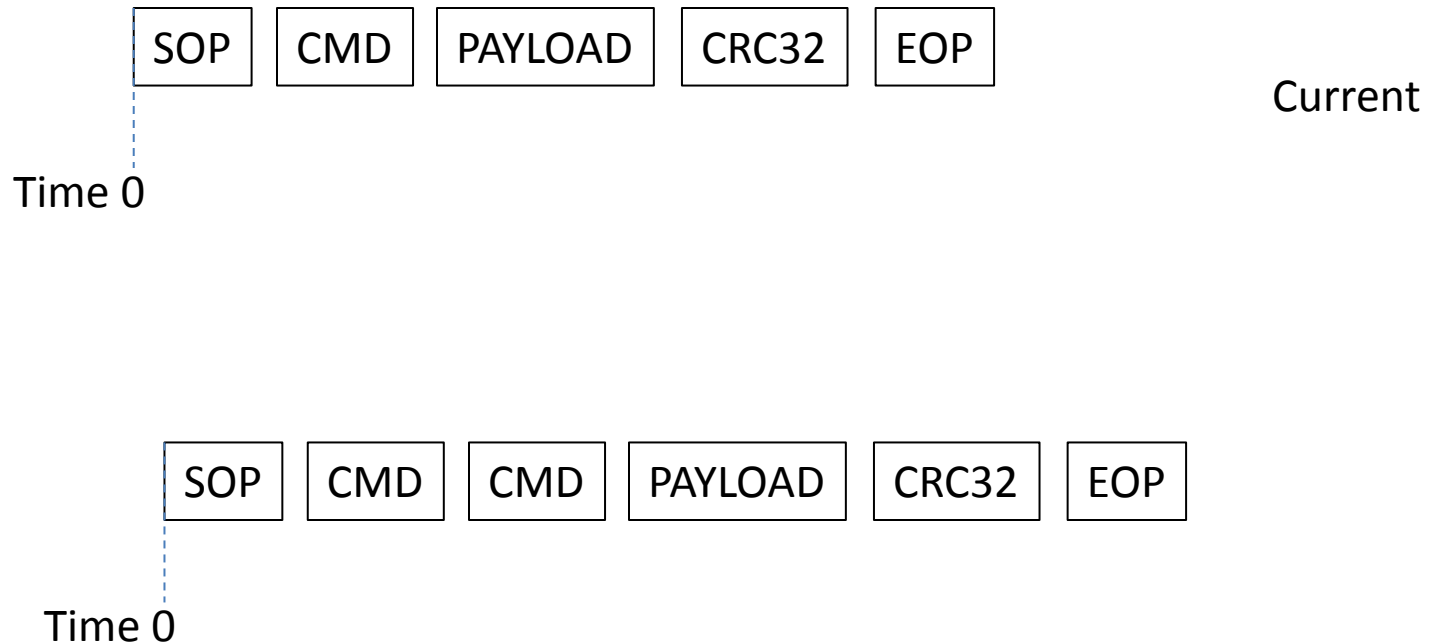


Are two commands too much overhead?

- padding of packet plus more CMD checking

- Do SPI folks think this is too much redundancy?



CONFIG Packet

Xmit	Data	Hex	Binary
1st	SOP	0xFB	0b11111011
2	CMD	0x01	0b00000001
3	TARGET_ID Byte 0	0x01	0b00000001
4	TARGET_ID Byte 1	0x00	0b00000000
5	CRC32 Byte 0	0x64	0b01100100
6	CRC32 Byte 1	0x82	0b10000010
7	CRC32 Byte 2	0x98	0b10011000
8	CRC32 Byte 3	0xE7	0b11100111
9	EOP	0xFD	0b11111101

64/66 encoding

SOP1	SOP2	SOP3	SOP4
CMD	TargetID B0	TargetID B1	CRC32 B0
CRC32 B1	CRC32 B2	CRC32 B3	PAD
EOP1	EOP2	EOP3	EOP4
SOP1	SOP2	SOP3	SOP4
CMD	CMD	TargetID B0	TargetID B1
CRC32 B0	CRC32 B1	CRC32 B2	CRC32 B3
EOP1	EOP2	EOP3	EOP4

Additional CMD byte allows CRC32 to be unsplit.
Is that a 'human' thing or is there a significant logic savings?

Formatting on 32 bit boundaries

Disclosure: Intellitech Ethernet Scan and Systembist

Use 32 bit boundaries for all packets. - Not trying to push one solution over another. Just trying to offer workable solution.

64/66 As written	SOP1	SOP2	SOP3	SOP4
	CMD	TargetID B0	TargetID B1	CRC32 B0
	CRC32 B1	CRC32 B2	CRC32 B3	PAD
	EOP1	EOP2	EOP3	EOP4
64/66 Extra CMD	SOP1	SOP2	SOP3	SOP4
	CMD	CMD	TargetID B0	TargetID B1
	CRC32 B0	CRC32 B1	CRC32 B2	CRC32 B3
	EOP1	EOP2	EOP3	EOP4
8B/10B As written	SOP	CMD	TargetID B0	TargetID B1
	CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
	EOP	PAD/IDLE	PAD/IDLE	PAD/IDLE
8B/10B Extra CMD	SOP1	CMD	CMD	TargetID B0
	TargetID B1	CRC32 B0	CRC32 B1	CRC32 B3
	CRC32 B4	EOP	PAD/IDLE	PAD/IDLE

2 64 Bit
transmissions

8B/10B
 Extra CMD
 + EOP 'n'

SOP1	CMD	CMD	TargetID B0
TargetID B1	CRC32 B0	CRC32 B1	CRC32 B3
CRC32 B4	EOP	EOP	EOP

Add as many EOP as needed for 32 bit boundary

Fill SOP
 Until on
 32 bit boundary

SOP	SOP	SOP	SOP
CMD	TargetID B0	TargetID B1	PAD
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP	EOP	EOP	EOP

Finish EOP
 Until 32 bit boundary

What about SPI? [Apply rule to encoded packets only?](#)
 (i.e. Leave SPI alone?)

1 SOP in 4 bytes (3 IDLES)
32 bit boundary

IDLE	IDLE	SOP	IDLE
CMD	CMD	TargetID B0	TargetID B1
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP	IDLE	IDLE	IDLE

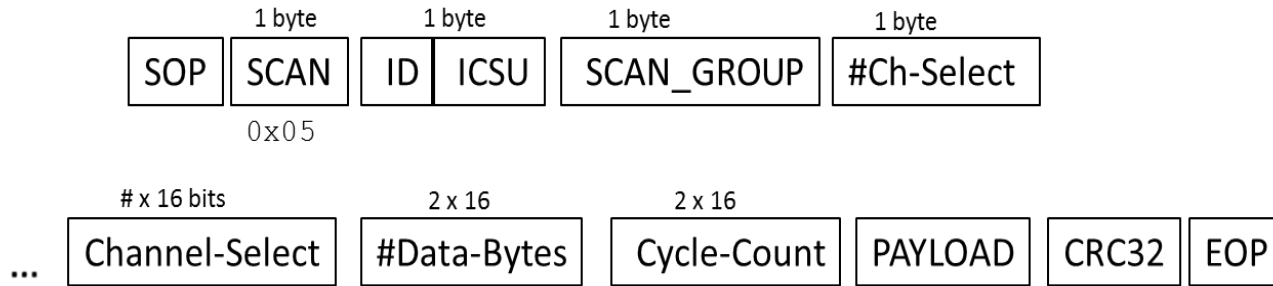
Finish one EOP and
3 IDLES

(mandatory rules when
Using Encoding, Control
Characters padded out
To multiples of 32 bits
Via IDLE bytes).

IDLE	IDLE	SOP	IDLE
CMD	CMD	TargetID B0	TargetID B1
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
IDLE	EOP	IDLE	IDLE

IDLES never single byte
And must be padded to
32 bits when IDLE is
In byte oriented encoding
- 8B/10B

IDLE	IDLE	SOP	IDLE
IDLE	IDLE	IDLE	IDLE
CMD	CMD	TargetID B0	TargetID B1
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
IDLE	EOP	IDLE	IDLE

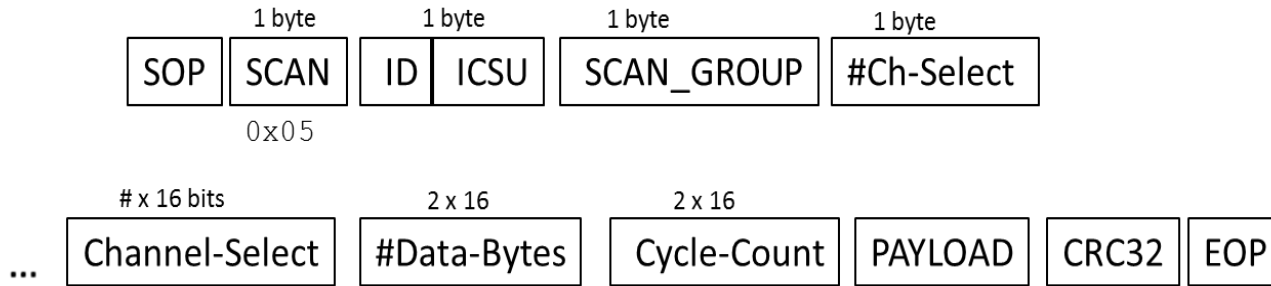


#CH-Select
= 2

SOP	CMD	ID-ICSU	Scan_Group
#Ch-Select	Channel-Select B0	Channel Select B1	Channel-Select B0
Channel-Select B1	#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2
#Data-Bytes 3	Cycle Count 0	Cycle Count 1	Cycle Count 2
Cycle Count 3	Payload 0	Payload 1	Payload 2
Payload 3
Payload N	CRC32 B0	CRC32 B1	CRC32 B2
CRC32 B3	EOP	PAD/IDLE	PAD/IDLE

DATA_SIZE = 8

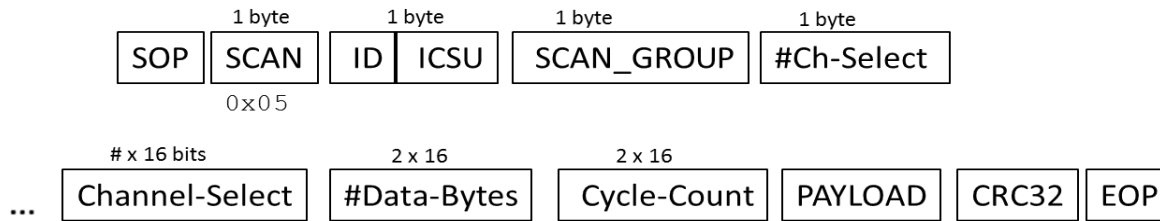
As Written



SOP	CMD	ID-ICSU	Scan_Group
#Ch-Select	Channel-Select B0	Channel Select B1	Channel-Select B0
Channel-Select B1	#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2
#Data-Bytes 3	Cycle Count 0	Cycle Count 1	Cycle Count 2
Cycle Count 3	Payload 0	Payload 1	Payload 2
Payload 3
Payload N	PAD	PAD	PAD
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP	IDLE	IDLE	IDLE

DATA_SIZE = 32

As Written



Note Two
Channel select
Words.

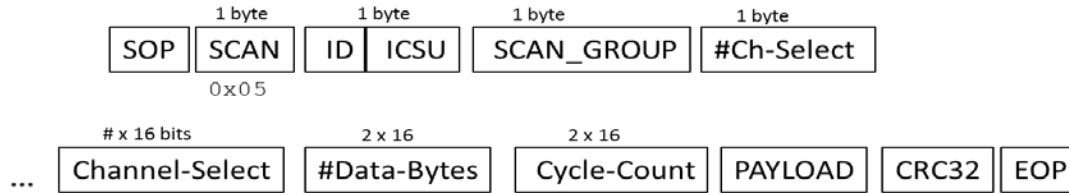
Odd number of
Channel-Select
Words and
#data-bytes,
Cycle count
And CRC are not split
Over 32 bit boundary

SOP	IDLE/PAD	IDLE/PAD	IDLE/PAD
CMD	ID-ICSU	Scan_Group	#Ch-Select
Channel-Select B0	Channel Select B1	Channel-Select B0	Channel-Select B1
#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
Payload 0	Payload 1	Payload 2	Payload 3
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP	IDLE/PAD	IDLE/PAD	IDLE/PAD

$$\text{DATA_SIZE} = 32$$

Extend DATA_SIZE to Channel-Select, SOP and EOP?
IDLE or PAD?

Format IDLEs to DATA_SIZE?



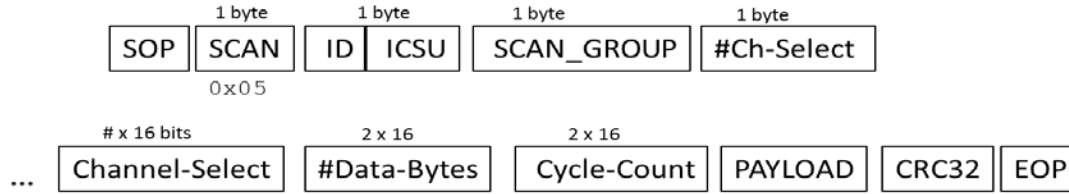
64/66 + Limit #Ch-Select to be EVEN? **NO**
 Otherwise have to pad out to 32 bits

SOP1	SOP2	SOP3	SOP3
CMD	ID-ICSU	Scan_Group	#Ch-Select
Channel-Select B0	Channel Select B1	Pad	Pad
#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
Payload 0	Payload 1	Payload 2	Payload 3
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP1	EOP2	EOP3	EOP4

Note Two
 Channel select
 Words.

Odd number of
 Channel-Select
 Words and
 #data-bytes,
 Cycle count
 And CRC are split
 Over 32 bit boundary

DATA_SIZE = 32



8b/10b

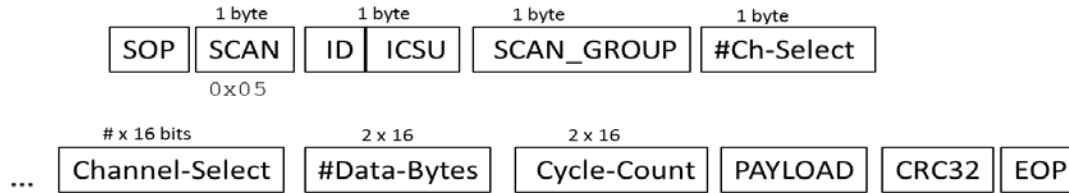
Force SOP/EOP to 32 bits?
 Limit #Ch-Select to be EVEN?
 Otherwise have to pad out to 32 bits

Note 1
 Channel select
 Words (2 bytes)

Odd number of
 Channel-Select
 Words and
 #data-bytes,
 Cycle count
 And CRC are split
 Over 32 bit boundary

→	SOP/IDLE	SOP/IDLE	SOP/IDLE	SOP/IDLE
	CMD	ID-ICSU	Scan_Group	#Ch-Select
→	Channel-Select B0	Channel Select B1	Pad	Pad
	#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
	Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
→	Payload 0	Payload 1	Payload 2	Payload 3
	CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
→	EOP/IDLE	EOP/IDLE	EOP/IDLE	EOP/IDLE

DATA_SIZE = 32
 Force IDLE to be 4 bytes as well?



8b/10b

Force SOP/EOP to 32 bits?
 Limit #Ch-Select to be EVEN?
 Otherwise have to pad out to 32 bits

Note 1
 Channel select
 Words (2 bytes)

Odd number of
 Channel-Select
 Words and
 #data-bytes,
 Cycle count
 And CRC are split
 Over 32 bit boundary

→	SOP/IDLE	SOP/IDLE	SOP/IDLE	SOP/IDLE
	CMD	ID-ICSU	Scan_Group	#Ch-Select
→	Channel-Select B0	Channel Select B1	Pad	Pad
	#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
	Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
→	Payload 0	Payload 1	Payload 2	Payload 3
	CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
→	EOP/IDLE	EOP/IDLE	EOP/IDLE	EOP/IDLE

DATA_SIZE = 64
 Force IDLE to be 4 bytes as well?

Data_Size = 32bits 8b/10b

Channel-
select
Padded out

SOP/IDLE	SOP/IDLE	SOP/IDLE	SOP/IDLE
CMD	ID-ICSU	Scan_Group	#Ch-Select
Channel-Select B0	Channel Select B1	Pad	Pad
#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
Payload 0	Payload 1	Payload 2	Payload 3
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP/IDLE	EOP/IDLE	EOP/IDLE	EOP/IDLE

IDLEs
formatted
To
DATA_SIZE

IDLE	IDLE	IDLE	IDLE
SOP/IDLE	SOP/IDLE	SOP/IDLE	SOP/IDLE
CMD	ID-ICSU	Scan_Group	#Ch-Select
Channel-Select B0	Channel Select B1	Pad	Pad
#Data-bytes 0	#Data-Bytes 1	#Data-Bytes 2	#Data-Bytes 3
Cycle Count 0	Cycle Count 1	Cycle Count 2	Cycle Count 3
Payload 0	Payload 1	Payload 2	Payload 3
CRC32 B0	CRC32 B1	CRC32 B3	CRC32 B4
EOP/IDLE	EOP/IDLE	EOP/IDLE	EOP/IDLE

Alternative approach: EOP/SOP must appear within four IDLES