File = L:\word_p\wp6doc\dmx-man\sip_info.wpd

Appendix 3 SYSTEM INFORMATION PACKETS (SIPS)

This is a feature that was added to DMX512 when it formally became E1.11. It is a useful feature for checking system reliability. While it is not commonly supported yet, we feel that having it in the DMXter4 will be useful, especially as it becomes supported by more vendors.

This section is an over view of what SIPS are and what data is in which slot. It does not give details of the routines that generate and display SIPs; that is in 4.11.5 for **SEND PACKETS W SIPS** and in 5.9 for **VIEW SIPS**.

A3.1 Non-SIP Uses for the SIP routines

The VIEW SIPS menu contains a version of the **VIEW LEVELS** which may be useful for certain types of testing that does not involve SIPs. See section 5.9.7 for more details.

A3.2 What Are SIP?

SIPs are special Alternate START Code packets containing information which describes the content of the Null START Code packets preceding them. In the following sections about SIPs, text that is in a san-serif type is a quotation from **E1.11 - 2004 -Entertainment Technology - USITT DMX512-A -Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories** (Used with permission). While we believe the quotes are correct, they are partial quotes and should not be relied on as a substitute for reading the whole standard.

D4 System information packet (SIP) Alternate START Code

Alternate START Code CFh (207 decimal) is reserved for a System Information Packet (SIP). The SIP includes a method of sending checksum data relating to the previous NULL START Code packet on the data link and other control information . . .

* * *

D4.1 Application

Manufacturers of control consoles are encouraged to transmit SIPs, either as a background to normal processing or, in conjunction with the special test packet, as part of their suite of system test functions.

One of the current problems with testing of DMX512 installations is that it must be done with static test packets – certain modes of testers cannot be used while a console is actually running the show, as by definition the DMX512 packets are varying as each cue runs. The interleaving of SIP's would allow some degree of live testing, particularly if one or more test packets were also sent applicable to the functionality of the receiving device.

Note: For systems requiring a more reliable link, manufacturers would have the option of following every normal packet with a SIP packet, although it is recognized that this would degrade data throughput. It could be used with systems that send packets of fewer than 512 DMX512 data slots or refresh data at less than the maximum rate.

A3.3 SIP PACKET STRUCTURE

Currently SIPs are packets of 25 bytes. (24 slots and the START Code.) However, future versions of the packet may be longer. The following table identifies the use of the bytes. Again this section is an overview of SIP so that you can understand what the DMXter4 is displaying and is not a substitute for the standard.

Table 3-1 System Information Packet Slot Layout

Slot	Definition	In Manual	In E1.11
0	START Code = CFh (207 decimal)		
1	SIP Byte Count/SIP Checksum pointer (valid value is 24)	A3.3(1)	D4.3
2	Control Bit Field	A3.3(2)	D4.4
3	MSB of 16 bit additive Checksum of previous packet	A3.3(3)	D4.5
4	LSB of the 16 bit Checksum of previous packet		
5	SIP sequence number	A3.3(4)	D4.6
6	DMX512 universe number	A3.3(5)	D4.7
7	DMX512 processing level	A3.3(6)	D4.8
8	Version of Software sending this SIP	A3.3(7)	D4.9
9	Standard Packet Len MSB	A3.3(8)	D4.10
10	Standard Packet Len LSB		
11	Number of Packets transmitted by originating device since last SIP MSB	A3.3(9)	D4.11
12	Number of Packets transmitted by originating device since last SIP LSB		
13	Originating Device's Manufacturer ID MSB	A3.3(10)	D4.12
14	Originating Device's Manufacturer ID LSB		
15	Second Device's Manufacturer ID MSB	A3.3(11)	D4.13
16	Second Device's Manufacturer ID LSB		
17	3rd Device's Manufacturer ID MSB	A3.3(11)	D4.13
18	3rd Device's Manufacturer ID LSB		
19	4th Device's Manufacturer ID MSB	A3.3(11)	D4.13
20	4th Device's Manufacturer ID LSB		
21	5th Device's Manufacturer ID MSB		D4.13
22	5th Device's Manufacturer ID LSB		
23	reserved for future use - transmit as 0		D4.3
24	8-bit Additive Checksum of the SIP	A3.3(12)	D4.14

A3.3(1) - D4.3 SIP checksum pointer

Transmitting devices shall send a value of 24 in slot 1 that represents the length of SIP Packet in this version of the Standard. Receivers shall use the value received in slot 1 to establish the offset to the SIP checksum.

A3.3(2) - D4.4 Control Field

Slot 2 of the packet is known as the control field. Only two bits in this field are of interest in the current version of the standard.

Bit 0 has the grandiose name - 'Subsequent NULL packet hold control bit'
Implementation of this bit by receivers is optional - If implemented, when the bit is set, the next Null START Code packet should be held until the Null packet checksum in the next SIP is validated. If a second NULL START Code packet is received without a preceding SIP, the receiver shall return to an immediate use mode.

Bit 1- if set the previous packet was an Alternate Start Code (ASC) packet. We are not at all sure use of bit 1 of the control field will be widely supported. We include it for completeness.

A3.3(3) - D4.5 Checksums

Slot three and four are a 16 bit ones complement additive checksum of all slots in the previous packet. The checksum includes the START Code.

A3.3(4) - D4.6 SIP Sequence number

Slot 5 is a free running 8-bit counter identifying the SIP and incremented by a SIP generator by 01h on every subsequent SIP. This field may be checked to ensure that SIPs have not been missed. The *Lil*'DMXter does not evaluate this slot; it simply displays it and uses it as part of the checksum data.

A3.3(5) - D4.7 Originating Universe

Slot six indicates the (originating) DMX512 universe currently transmitted on this link. 00h is not used. Valid values are 01h - FFh (1 decimal - 255 decimal).

A3.3(6) - D4.8 DMX512 processing level

Slot seven gives some information on how many 'black boxes' are stuck in the DMX system between the console and the point you are looking at. What this number will mean in terms of system performance is very dependent on what the black boxes are. The type of devices that this field is supposed to keep track of are merges, DMX-Ethernet / Ethernet-DMX convertors and any device that re-times the data stream. Splitters and RDM hubs normally would not be considered a processing device for this purpose.

Originating devices shall always transmit a value of 00h in this field. Processing devices or any that regenerate or provide a media conversion (e.g., Ethernet to DMX512) facility and do not explicitly block ASC packets per clause D3 shall increment the value of this field by 01h. The content of this field indicates a level of process "hops" that data on the link has been subjected to relative to the originating transmitting device.

A3.3(7) - D4.9 Software version

The value of this slot gives a pointer to the version of the software in the LAST device to process this packet. It will be useful when reporting problems to a manufacturer. Warning: this number is not required to have any standard relationship to the published or configuring screen software version number. The reason for this apparently foolish allowance is that there are many ways to report software versions and many take more than an 8-bit byte to encode. The manufacturer will know what the number means and may have been kind enough to include it in the equipment manual.

The number reported by the *Lil*'DMXter software is published software number with decimal removed, minus 239. For this software (V2.45) the reported number is six (245-239).

00h	= The feature is not implemented
01h - FFh	= firmware version of last device as described above.

A3.3(8) - D4.10 Packet lengths

This Slot declares the standard length of packets for START Code 00, normally transmitted on this link. Valid values are

0000h packet length not declared
0001h - 0200h designates value of the packet length
0201h - 7FFFh are reserved
8000h Dynamic Packet, length not declared
8001h - 8200h length of last dynamic packet
8201h - FFFFh are reserved

The *Lil*'DMXter always declares the value of the last null packet sent. The DMXter does not dynamically change packet lengths without operator intervention.

A3.3(9) - Number of packets

Bits 11 and 12 are 16 bit count of the number of packets transmitted by the originating device since last SIP was transmitted. This count should not increment past FFFFh.

A3.3(10) - D4.12 Manufacturer ID

Manufacturer ID will be the same 16 bit assignment as used for the Manufacturer's ID field used with Alternate START Code 91h (see Annex E - clause E1).

an ID == 0000h indicates that Manufacturer is not declared.
an ID == FFFFh indicates that Manufacturer has applied for, but not been granted an ID and that this transmission originates from a product under development.

A3.3(11) - D4.13 Packet history

DMX512 Processing devices and media converters that process SIPs shall be required to insert their own Manufacturer's ID into the SIP packet. An originating device shall always send its Manufacturer's ID in SIP slots 13 and 14, with 0000h in slots 15, 16; 17, 18; 19, 20 and 21, 22. Subsequent processing devices shall insert their manufacturer's ID into the slots as indicated by the DMX512 processing level slot. A processing level of 01h corresponds to the second device, a processing level of 02h corresponds to the third device, and so on. . .

A3.3(12) - D4.14 SIP Checksum

Slot 24 is an 8-bit ones complement additive checksum of the SIP START Code (CFh) and all subsequent slots of SIP data.