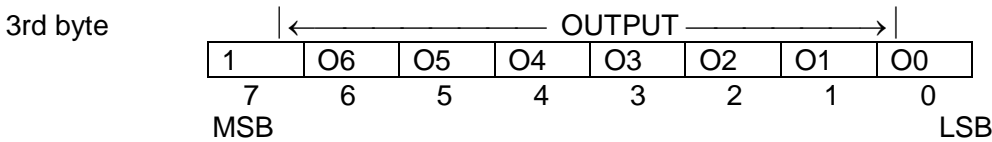
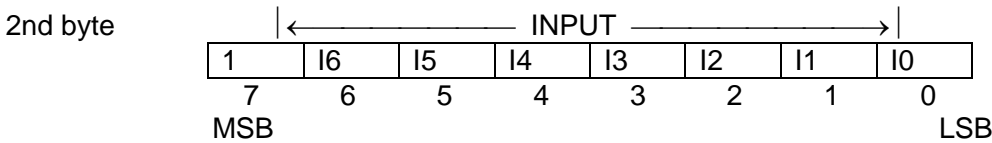
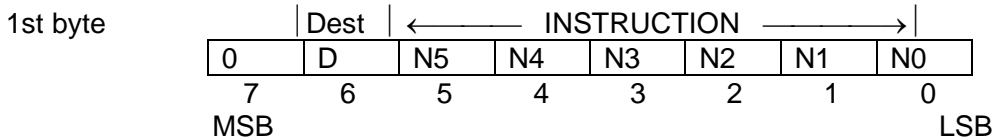


COMMUNICATION PROTOCOL FOR BC-2516 / 2216 / 2616 (VER3.0)

Communication with the 2516 / 2616 uses three bytes of information as defined below. Data is transferred at 1200, 9600 (default) or 19200 baud (selected via the switcher's SYS function), with no parity, 8 data bits and 1 stop bit.



1st BYTE: Bit 7 - Defined as 0.

D - "DESTINATION BIT".

This bit is low when sending from the PC to the switchers, and high for information sent to the PC.

N5..N0 - "INSTRUCTION".

The function which is to be performed by the switcher(s) is defined by these 6 bits. Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO. which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5..N0).

2nd BYTE: Bit 7 - Defined as 1.

I6..I0 - "INPUT".

When switching via RS-232 (i.e. for instruction codes 1 and 2), the input which is to be switched is set by these bits. Similarly, if switching is done via the machine's keyboard, then these bits are set with the input number which was switched. For disconnect, set as 0. For other operations, these bits are defined according to the table.

3rd BYTE: Bit 7 - Defined as 1.

O6..O0 - "OUTPUT".

When switching via RS-232 (i.e. for instruction codes 1 and 2), the output to switch is set by these bits. Similarly, if switching is done via the machine's keyboard, then these bits are set with the output number which was switched. For other operations, these bits are defined according to the table.

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
0	RESET VIDEO	0	0	1
1	SWITCH VIDEO	set equal to video input to be switched	set equal to video output to be switched	2
2	SWITCH AUDIO	set equal to audio input to be switched	set equal to audio output to be switched	2
3	STORE VIDEO STATUS	set as SETUP # (0-15)	don't care	2,7
4	RECALL VIDEO STATUS	set as SETUP # (0-15)	don't care	2,7
5	REQUEST STATUS OF A VIDEO OUTPUT	set as SETUP # (0-15)	equal to output number whose status is reqd	3,7,8
6	REQUEST STATUS OF AN AUDIO OUTPUT	set as SETUP # (0-15)	equal to output number whose status is reqd	3,7,8
7	VIS SETTING	don't care	0 for immediate switching 1 for VIS switching	2
8	BREAKAWAY SETTING	don't care	0 for audio-follow-video 1 for breakaway	2
9	VIDEO TYPE SETTING	don't care	1 = CV 2 = YC 3 = YUV 4 = RGBS	2
10	REQUEST VIS SETTING	set as SETUP # (0-15)	don't care	3,7
11	REQUEST BREAKAWAY SETTING	set as SETUP # (0-15)	don't care	3,7
12	REQUEST VIDEO TYPE SETTING	set as SETUP # (0-15)	don't care	3,7
13	SET HIGHEST MACHINE NUMBER	set as 0 for video or 1 for audio	set equal to highest machine number	2
14	REQUEST HIGHEST MACHINE NUMBER	don't care	don't care	3
15	REQUEST WHETHER SETUP IS DEFINED	set as SETUP # (0-15)	don't care	4
16	ERROR / BUSY	don't care	don't care	5
17	RESERVED	-----	-----	6
18	RESET AUDIO	0	0	1
19	STORE AUDIO	set as SETUP # (0-15)	don't care	2,7
20	RECALL AUDIO	set as SETUP # (0-15)	don't care	2,7
21 to 56	READ DATA FROM A MACHINE	set as SETUP# to read video data (i.e. 0-15); or as 64+SETUP# to read audio data (ie.64-79)	set as DATA # (0-21)	7,9,10
57	SET AUTO-SAVE	1=auto-save, 0=no save	don't care	11
58	RESERVED	-----	-----	6
59	RESERVED	-----	-----	6
60	RESERVED	-----	-----	6
61	IDENTIFY MACHINE	1=vid name; 2=aud name 3=vid ver; 4=aud ver	don't care	12

NOTES on the above table:

NOTE 1 - When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

NOTE 2 - These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if

0000 0001

1000 1001

1001 0000

was sent from the PC, then the (video) switcher will switch input 9 to output 16. If the user switched input 5 to output 7 via the front panel keypad, then the switcher will send

0100 0001

1000 0101

1000 0111 to the PC.

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending the to PC the same three bytes that it was sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 3 - The reply to a "REQUEST" instruction is as follows: the same instruction and INPUT codes as were sent are returned, and the OUTPUT is assigned the value of the requested parameter. The replies to instructions 10, 11 and 12 are as per the definitions in instructions 7, 8 and 9 respectively. For example, if the present video type is YC, then the reply to

0000 1100

1000 0000

1000 0000

would be

0100 1100

1000 0000

1000 0010.

NOTE 4 - The reply to the "REQUEST WHETHER SETUP IS DEFINED" is as in TYPE 3 above, except that here the OUTPUT is assigned with the value 0 if the setup is not defined; or 1 if it is defined.

NOTE 5 - An error code is returned to the PC if an invalid code was sent to the switcher (e.g. trying to save to a setup greater than 15, or trying to switch an input or output greater than the highest one defined). This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel. Reception of this code by the switcher is not valid.

NOTE 6 - This code is reserved for internal use.

NOTE 7 - SETUP # 0 is the present setting. SETUP # 1 to SETUP # 15 are the settings saved in the switcher's memory, (i.e. those used for STO and RCL).

NOTE 8 - For a "stand-alone" machine, these codes may be used to read all the SETUPS. If several machines are configured in a system, these codes may be used to read the present setup (i.e. SETUP # 0) in the system. In order to read all the SETUPS when several machines are configured, use instructions 21 to 56.

NOTE 9 - The INSTRUCTION # = MACHINE # + 20. For example, to read data from MACHINE # 3, set INSTRUCTION # = 23.

NOTE 10 - The reply to these instructions is as in NOTE 3 above. The DATA which can be read is defined as follows :-

0 to 15 :- first output to 16th output, respectively, on the machine being addressed.

For example, for machine number 1 in a composite setup, DATA # 0 would correspond to output 1, DATA # 1 to

output 2, and DATA # 15 to output 16. For machine number 2 in a composite setup, (the outputs in this case are 17 to 32), DATA # 0 corresponds to output 17, DATA # 1 to output 18, and DATA # 15 to output 32.

16 :- For video machine:- VIS setting.

For audio machine:- system type setting (audio only=0, audio + video=1)

NOTE - If a value of 128 or more is returned for this DATA, then this SETUP has not been defined.

17 :- video type setting 18 :- breakaway setting 19 :- machine number

20 :- highest machine number

21 :- baud rate - used for SETUP # 0 only, where: 1 = 1200 baud

2 = 9600 baud

3 = 19200 baud

NOTE 11 - Under normal conditions, the machine's present status is saved each time a change is made.

Saving the status takes about 60ms. For situations where high switching speeds are required, the "power-down" save (auto-save) may be disabled using this code. Note that whenever the machine is turned on, the auto-save function is set.

NOTE 12 - This is a request to identify the switcher/s in the system. If the INPUT is set as 1, the video machine will send its name. If set as 2, the audio machine sends its name. The reply is the decimal value of the INPUT and OUTPUT. For example, for a 2216, the reply to the request to send the audio machine name would be,

0111 1101

1001 0110 (i.e. 128 + 22)

1001 0000 (i.e. 128 + 16)

If the request for identification is sent with the input set as 3 (video), or 4 (audio), the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it. For example, for version 3.5, the reply would be

0111 1101

1000 0011 (i.e. 128 + 3)

1001 0101 (i.e. 128 + 5)