

## PROTOCOL USED FOR X02 COMMUNICATION (RS-232)

Communication between the PC and the master VS-1202/802/602/402 is done using 2 bytes of information, as defined below. The rate of data transfer is 1200 baud, with no parity, 8 data bits and one stop bit.

1 <sup>st</sup> Byte							
N7	N6	N5	N4	N3	N2	N1	N0
MSB							LSB

2 <sup>nd</sup> Byte							
N15	N14	N13	N12	N11	N10	N9	N8
MSB							LSB

where

N7 = 0 (continue bit).

N6N5N4N3 are defined according to the table below. These bits are only relevant for transmission from the machine to the PC, but are not required when transmitting from the PC to the machine.

	N6	N5	N4	N3
<b>VS-402</b>	0	1	0	0
<b>VS-602</b>	0	1	0	1
<b>VS-802</b>	0	1	1	0
<b>VS-1202</b>	0	1	1	1

N2N1N0 is the binary value of the machine being addressed (or of the machine sending its data) minus one, eg. N2N1N0=000 to address machine #1 (the master); N2N1N0=101 to address machine #6.

N15 = 1 (continue bit).

N14 = 0 for all communication to and from the PC.

N13 is to be high if the data N12N11N10N9N8 is an opcode (see below).

N12N11N10N9N8 is data related to the status of the machine (for the case where N13 is low). When the machine sends its status, it is the value of an input presently selected; when the PC instructs the machine to change state it is the value of the input to be selected. The data is related to the switches as shown below - the sketch showing the switches on the face of the machine. (For the VS-802, ignore 17 to 24; for the VS-602, ignore 13 to 24; and for the VS-402, ignore 9 to 24).

1	3	5	7	9	11	13	15	17	19	21	23
2	4	6	8	10	12	14	16	18	20	22	24

When N13 is high, the following opcodes are defined:

N12N11N10N9N8 = 00001 instructs machine to send its present status.

N12N11N10N9N8 = 00010 success code (change in status was performed).

N12N11N10N9N8 = 00011 non-successful (change in status was not performed).

NB: The success/non-success codes are only used when instructing a machine which is present to change its status. The code returned in this case depends on whether the operation requested is valid or not.

## Switch Matrix Coding for the VS-1202,802,602,402

	VS-1202		VS-802		VS-602		VS-402	
	Output #1	Output #2	Output #1	Output #2	Output #1	Output #2	Output #1	Output #2
Input #1	38 H 81 H	38 H 82 H	30 H 81 H	30 H 82 H	28 H 81 H	28 H 82 H	20 H 81 H	20 H 82 H
Input #2	38 H 83 H	38 H 84 H	30 H 83 H	30 H 84 H	28 H 83 H	28 H 84 H	20 H 83 H	20 H 84 H
Input #3	38 H 85 H	38 H 86 H	30 H 85 H	30 H 86 H	28 H 85 H	28 H 86 H	20 H 85 H	20 H 86 H
Input #4	38 H 87 H	38 H 88 H	30 H 87 H	30 H 88 H	28 H 87 H	28 H 88 H	20 H 87 H	20 H 88 H
Input #5	30 H 89 H	30 H 8A H	30 H 89 H	30 H 8A H	28 H 89 H	28 H 8A H		
Input #6	30 H 8B H	30 H 8C H	30 H 8B H	30 H 8C H	28 H 8B H	28 H 8C H		
Input #7	38 H 8D H	38 H 8E H	30 H 8D H	30 H 8E H				
Input #8	38 H 8F H	38 H 90 H	30 H 8F H	30 H 90 H				
Input #9	38 H 91 H	38 H 92 H						
Input #10	38 H 93 H	38 H 94 H						
Input #11	38 H 95 H	38 H 96 H						
Input #12	38 H 97 H	38 H 98 H						