

Videojet 1510 and 1210 Simple Communications Protocol

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Supported Packet Types:

The following packet types are proposed for inclusion in the “quick and simple” protocol:

- *Message Select -* *Select a message to print from the list of existing messages.*
- *Delete Message Text -* *Clear all existing text from the currently printing message.*
- *Update Message Text -* *Update the message content of the currently printing message.*
- *Set Message Parameters -* *Set the print parameters associated with the currently printing message.*
- *Delete User Field Data -* *Clear data from an existing named user field.*
- *Update User Field Data -* *Update the data within an existing named user field.*
- *Update Logo Data -* *Update the bit pattern of an existing named logo.*
- 1. *Set Module Widths -* *Set the module widths (bars and gaps) for printing barcodes.*
- *Request Part Number -* *Return the Software Part Number from the machine.*
- *Request Error Status-* *Returns the errors currently operative within the software.*

General Protocol Packet Specification:

Each protocol packet sent to the machine must adhere to the following general format:

[STX] [TYPE] [DATA] [ETX]

[STX] Is a fixed single ASCII character 02h which is used to indicate the start of the protocol packet.

[TYPE] Is a single ASCII character in the range 'A' to 'Z' used to describe the type of protocol packet which is being sent.

[DATA] Is a multiple ASCII character field, where all character codes are within the range ASCII 20h to FFh plus 0Ah (i.e. no control codes, apart from 0Ah is used as a field separator). This field is of variable length format.

[ETX] Is a fixed single ASCII character 03h which is used to indicate the end of a protocol packet.

In response the machine will reply with a three character check sequence as follows:

\$XX Where XX is a pair of ASCII characters within the range ASCII '0' to '9' or 'A' to 'F'. The character pair XX describes the modulo 256 sum of all characters between the [STX] and [ETX] fields, (not including those fields). The first character represents the high four bits of the checksum, and the second character the low four bits of the checksum.

“Message Select” Packet Format

Selects a message to print from the list of existing messages stored within the machine. If the message does not exist the currently printing message will remain unchanged.

[STX] [TYPE] [MESSAGE NAME] [ETX]

- The TYPE field contains the single ASCII character ‘M’.
- The MESSAGE NAME field is a string of between 1 and 30 ASCII characters describing an existing message stored within the machine.

“Delete Message Text” Packet Format

Clear all existing text from the currently printing message, leaving the message content blank, but the message parameters unchanged. This command does not delete the message.

[STX] [TYPE] [ETX]

- The TYPE field contains the single ASCII character ‘C’.

“Update Message Text” Packet Format

Update the message content of the currently printing message in line with the new data supplied within the data field of the packet. This command deletes the current message content before the new text is inserted.

[STX] [TYPE] [MESSAGE DATA 1] [SEP] [MESSAGE DATA n] [ETX]

- The TYPE field contains the single ASCII character ‘T’.
- The MESSAGE DATA fields contain several sub fields as described below. There may be several MESSAGE DATA fields within a single message, each separated by a SEP field.
- The SEP field may only contain the single ASCII characters LF (0Ah), and is used to separate data fields within a message data packet.

MESSAGE DATA Field Format

Each message data field must be in the following format:

[FONT NUM] [HORC] [VERC] [ATTRIB] [MESSAGE TEXT]

- The FONT NUM field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 99. It describes the font number to be used for the following text. The font number follows the order in which the fonts appear when using the editor, (i.e. font 0 is always 7hi, but the rest will be dynamically allocated according to the fonts fitted). Refer following table for Font Number & Font correlation :

Font Number	Font Height
0	7 High
1	9 High
2	12 High
3	16 High
4	24 High
5	34 High
6	5 High

- The HORC field consists of exactly 4 characters (ASCII '0' to '9') which represent a decimal value between 0 and 9999. It describes the relative horizontal position at which the text fragment should be placed within the message (**Note: this position is relative and subject to left justification**). It should be thought of as a fragment ordering control rather than a means of placing the text fragment in an exact location (i.e. the text fragment with a HORC of 1 will always be to the left of another text fragment with a HORC of greater than 1, etc).
- The VERC field consists of exactly 3 characters (ASCII '0' to '9') which represent a decimal value between 0 and 999; it describes the vertical position at which the text field should be placed within the message. **Note: the whole message is subject to upward justification**. If blank lines are required at the top of a message a dummy fragment containing a single space character in an appropriate font must be sent.
- The ATTRIB field consists of exactly 6 characters (ASCII '0' to '9' or 'A' to 'F'). The first five characters represent a hexadecimal value between 0 and FFFFF, it describes a bit mask which is used to apply various attributes to the message text field (refer following tables for more detail). The sixth character represents a hexadecimal value between 0 and F, it describes the code page number to be used. If the Barcode is selected it is expected from client application to send valid data for barcode.

- The MESSAGE TEXT field consists of up to 200 ASCII characters which describe the text to be entered within the message, or (if it starts with the character “@”) the name of a single user field. This arrangement allows plain text, barcodes, counters, or other real-time data to be inserted within the message. The print orientation and presentation is controlled via the attribute field.

- ATTRIB CHAR 1:

Bit No	Attribute
Bit 0	INVERT
Bit 1	REVERSE
Bit 2	CLOCK_CODE
Bit 3	Double Dots On

- ATTRIB CHAR 2:

Bit No	Attribute
Bit 0	Triple Dots On
Bit 1	TOWER_PRINTING
Bit 2	PROMPTED_USER_FIELD
Bit 3	BARCODE_HR_ON

- ATTRIB CHAR 3:

Bit No	Attribute
Bit 0	Use Custom Font
Bit 1	Inverse Video
Bit 2	BARCODE_CHECKSUM_ON
Bit 3	Not Used

- ATTRIB CHAR 4 & 5 (For Barcode):

Value	Attribute
00	Barcode None
01	ITF
02	EAN 8
03	EAN 13
04	UPC-A
05	UPC-E
06	Code-128
07	EAN 128
08	Code 39
09	Data Matrix 10 x 10
0A	Data Matrix 12 x 12
0B	Data Matrix 14 x 14
0C	Data Matrix 16 x 16
0D	Data Matrix 18 x 18
0E	Data Matrix 20 x 20
0F	Data Matrix 22 x 22
10	Data Matrix 24 x 24
11	Data Matrix 26 x 26
12	Data Matrix 32 x 32
13	Data Matrix 8 x 18
14	Data Matrix 8 x 32
15	Data Matrix 12 x 26
16	Data Matrix 12 x 36
17	Data Matrix 16 x 36
18	Data Matrix 16 x 48

“Modify Message Parameters” Packet Format

Update the print parameters associated with the currently printing message in line with the new parameter list supplied within the data field of the packet.

[STX] [TYPE] [REV] [INV] [WID] [EHT] [GAP] [EXP] [HEJRA][DLY] [BLD] [DRP] [RASSUB][RLEN][RAS] [ETX]

- The TYPE field contains the single ASCII character ‘P’.
- The REV Field consists of a single ASCII character where ‘0’ represents OFF and ‘1’ represents ON, it describes the message parameter “message reverse”.
- The INV field consists of a single ASCII character where ‘0’ represents OFF and ‘1’ represents ON, it describes the message parameter “message invert”.
- The WID field consists of exactly 4 characters (ASCII ‘0’ to ‘9’) which represent a decimal value ranged as indicated in table, it describes the message parameter “width”. Unit of this field is depending on the “Display Unit of measure” & “Message Configuration” parameters in printer. In Case measuring unit is selected as Inches unit of this field will be 1/100th of inch e.g. 1.25” should be sent as 125. In case of Metric it will be in mm. Please refer following table for value range

Metric (mm)		1/100 Inches	
Divider / Strokes	Linear Units	Divider / Strokes	Linear Units
1-255	1-999	1-255	1-3936 (1=0.01”)

When Shaft Encoder source is selected as Auto Encoder

Metric (mm)		1/100 Inches	
Strokes per mm	Linear Units	Strokes per Inches	Linear Units
1-10	1-999	1-254	1-3936 (1=0.01”)

- The EHT field consists of exactly 2 characters (ASCII ‘0’ to ‘9’) which represent a decimal value between 1 and 10, it describes the message parameter “message height”.
- The GAP field consists of a single character (ASCII ‘0’ to ‘9’) which represents a decimal value between 0 and 9, it describes the message parameter “inter-character gap”.
- The EXP field consists of exactly 5 characters (ASCII ‘0’ to ‘9’) which represent a decimal value between 0 and 32767, it describes the message parameter “expiry date - days ahead counter”.

- The HEJRA field consists of exactly 5 characters (ASCII '0' to '9') which represent a decimal value between 0 and 32767, it describes the message parameter "Hejra expiry days ahead".
- The DLY field consists of exactly 5 characters (ASCII '0' to '9') which represent a decimal value ranged as indicated in table, it describes the message parameter "product delay". Unit of this field is depending on the "Display Unit of measure" & "Message Configuration" parameters in printer. In Case measuring unit is selected as Inches unit of this field will be 1/100th of inch e.g. 1.25" should be sent as 125. In case of Metric it will be in mm.

Metric (mm)		1/100 Inches	
Divider / Strokes	Linear Units	Divider / Strokes	Linear Units
0-9999	0-999	0-9999	0-3936 (1 = 0.01")

- The BLD field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 10, it describes the message parameter "raster repeat".
- The DRP field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 34, it describes the message parameter "printed dots".
- The RASSUB field consists of a single ASCII character where '0' represents OFF and '1' represents ON, it describes the message parameter "Raster Substitution".
- The RLEN field consists of exactly 3 characters (ASCII '0' to '9') which represent a decimal value between 1 and 255, it describes the length of the raster filename that is to follow
- The RAS field consists of ASCII characters as per the previous RLEN field, it describes the message parameter "Raster"

"Clear User Field Data" Packet Format

Clear data from an existing named user field, leaving the user field blank. This command does not delete the user field. (Not applicable for Logs & Counters).

[STX] [TYPE] [USER FIELD NAME] [ETX]

- The type field contains the single ASCII character 'D'.
- The USER FIELD NAME field is a string of between 1 and 30 ASCII characters describing an existing user field stored within the machine.

“Update User Field Data” Packet Format

Update the data within an existing named user field in line with the new data supplied within the data field of the packet. This command deletes the current user field content before the new text is inserted.

[STX] [TYPE] [USER FIELD NAME] [SEP] [USER FIELD DATA] [ETX]

- The type field contains the single ASCII character ‘U’.
- The USER FIELD NAME field is a string of between 1 and 30 ASCII characters describing an existing user field stored within the machine.
- The SEP field may only contain the single ASCII characters LF (0Ah), and is used to separate data fields within a user field data packet.
- The USER FIELD DATA field is a string of between 1 and 50 ASCII characters describing the new text or counter value to be placed within the named user field.

Refer following table for setting counter value:

**[START VALUE] [CURRENT VALUE] [END VALUE] [STEP SIZE] [STEP DIRECTION]
[REPEAT COUNT] [LEADING CHAR] [INC/DEC COUNTER]**

- Start Value followed by single ASCII characters LF (0Ah).
- Current Value followed by single ASCII characters LF (0Ah).
- End Value followed by single ASCII characters LF (0Ah).
- Step Size followed by single ASCII characters LF (0Ah).
- Step Direction followed by single ASCII characters LF (0Ah) (1 – Increment – 0 Decrement).
- Repeat Count followed by single ASCII characters LF (0Ah).
- Leading Char followed by single ASCII characters LF (0Ah).
- Inc/Dec on Print or other counter value
- If out of range / invalid data will be sent the selected counter will not get modified.

“Update Logo Data” Packet Format

Update the bit pattern of an existing named logo in line with the new data supplied within the data field of the packet. This command deletes the current logo content before the new bit pattern is inserted.

**[STX] [TYPE] [LOGO NAME] [SEP] [NUM DROPS] [NUM RASTERS] [LOGO DATA]
[ETX]**

- The type field contains the single ASCII character ‘L’.
- The LOGO NAME field is a string of exactly 30 ASCII characters describing an existing user field stored within the machine.
- The SEP field may only contain the single ASCII characters LF (0Ah), and is used to separate data fields within a logo data packet.
- The NUM DROPS field consists of exactly 2 characters (ASCII ‘0’ to ‘9’) which represent a decimal value between 5 and 34 it describes the number of drops per raster in the logo data which follows.
- The NUM RASTERS field consists of exactly 3 characters (ASCII ‘0’ to ‘9’) which represent a decimal value between 1 and 255; it describes the number of rasters in the logo data which follows.
- The LOGO DATA field is a list of pairs of ASCII characters (‘0’ to ‘9’ and ‘A’ to ‘F’) describing the new logo bit pattern to be placed within the named logo. Each pair of ASCII characters are encoded as shown below:

Logo Byte Number

	00	02	04	06	08	10	12	14	16	18	20	22	24
Bit 7													
Bit 6			0	0	0	0	0	0	0	0			
Bit 5		0	0	0	0	0	0	0	0	0	0		
Bit 4	0	0	0							0	0	0	
Bit 3	0	0								0	0	0	
Bit 2	0	0							0	0	0	0	
Bit 1	0	0						0	0	0	0	0	
Bit 0	0	0					0	0	0		0	0	
Bit 7	0	0				0	0	0			0	0	
Bit 6	0	0			0	0	0				0	0	
Bit 5	0	0		0	0	0					0	0	
Bit 4	0	0	0	0	0						0	0	
Bit 3	0	0	0	0							0	0	
Bit 2	0	0	0							0	0	0	
Bit 1		0	0	0	0	0	0	0	0	0	0		
Bit 0			0	0	0	0	0	0	0	0			

The above logo would be represented by the following data:

0x1F, 0xFC, 0x3F, 0xFE, 0x70, 01F, 0x60, 0x3B, 0x60, 0x73, 0x60, 0xE3, 0x61, 0xC3,
0x63, 0x83, 0x67, 0x03, 0x7E, 0x07, 0x3F, 0xFE, 0x1F, 0xFC, 0x00, 0x00

It would be transmitted to the machine using the following packet:

<STX>L16 High Zero Logo<LF>160131FFC3FFE701F603B607360E
361C3638367037E073FFE1FFC0000<ETX>

“Set Module Widths” Packet Format

Set the module widths (bars and gaps) for printing barcodes, to ensure that barcodes are readable regardless of the ink spread on the substrate.

[STX] [TYPE] [BW1] [BW2] [BW3] [BW4] [GW1] [GW2] [GW3] [GW4][ETX]

- The type field contains the single ASCII character 'B'.
- The BW1 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the narrowest bar of the printed raster.
- The BW2 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the next narrowest bar of the printed raster.
- The BW3 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the next to widest bar of the printed raster.
- The BW4 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the widest bar of the printed raster.
- The BG1 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the narrowest gap of the printed raster.
- The BG2 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the next narrowest gap of the printed raster.
- The BG3 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the next to widest gap of the printed raster.
- The BG4 field consists of exactly 2 characters (ASCII '0' to '9') which represent a decimal value between 1 and 12; it describes the number of rasters in the widest gap of the printed raster.

“Stop Jet” Packet Format

Stops the jet as if “F1” has been pressed on the keypad, or the user has selected “Clean Stop Jet” from the “System” menu.

[STX] [TYPE] [ETX]

- The TYPE field contains the single ASCII character ‘K’.

“Request Part Number” Packet Format

Return the “Software Part Number” string stored within the machine.

[STX] [TYPE] [ETX]

- The type field contains the single ASCII character ‘H’.

The machine responds with the following packet:

[STX] [PART NUMBER] [ETX]

- The part number field contains exactly 16 ASCII characters which will return SW Version no. e.g. 1.0.291W. To make the part Number as 16 ASCII character, blanks are padded at the end of the string.

“Error Status Request” Packet Format

Return the Error Status Word and the Alarm Status Nibble

[STX] [TYPE] [ETX]

- The type field contains the single ASCII character ‘E’.

The machine responds with the following packet:

[STX] [EEEEEE] [ETX]

- The EEEEEEE field contains the 6 byte hexadecimal error status as follows:

Bit	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0	Charge error	Pump fault	BAD NOZZLE!!! Please replace or repair	Phasing threshold at maximum - no good phasing.\n Flush nozzle and check phase and charge voltages.	Rasters memory overflow detected!\nOne or more rasters must be removed to fix the problem.	Date/Time not set
1	EHT Trip	Cabinet too hot	Mod driver chip over temperature.\n Check mod circuit and/or replace nozzle.	Auto mod failed to obtain good phasing.\n Flush nozzle and check phase and charge voltages.	Valve error - contact service dept.	New Ink Core has a different ink reference.
2	Gutter fault	Ink core service overdue	Fatal error: no phase response from firmware. Contact customer services.	Initial phasing trim failed.\n Flush nozzle and check phase and charge voltages.	Core not filling. Check for leaks, stuck valves etc.	EHT calibration required
3	Ink core empty	Unable to control viscosity	Phasing threshold at minimum - no good phasing.\n Flush nozzle and check phase and charge voltages.	Modulation readback failed.\n Check mod circuit and/or replace nozzle.	Insufficient ink to fill core.\nInstall another cartridge and repeat.	N/A

- The A field contains the 7 bit hexadecimal alarm status word as follows:

Bit Number	Alarm Status Condition Represented
3	Alarm Activated – NOT USED
2	Red Trafficator On
1	Amber Trafficator On
0	Green Trafficator On

Differences in WSI protocol verses Videojet/Willett 40/400 series printers:

1. Update message text:

- The HORC field is justified to the top of the screen. The value for the upper most line is 034. Even if you have a message using a 7 high single line, you need to put 034 in the HORC field to get it in the top position. If you need to add a line beneath that 7 high line, the next HORC value would need to be 026 or lower (34 -7 high font – 1 space between lines).
- The ATTRIB field is now 6 characters as opposed to 5 on the 40 series. Codes being sent from an external source to create the message will need the extra nibble of information to be accepted as new data. This is because of the addition of 2D codes to the ATTRIB field.

2. Message parameters:

- Since the 1510 and 1210 have different message parameters than the 40 series, this command is now different. Fields like RASSUB, RLEN, and RAS are not included in the 40 series printers, but are necessary for the 1510/1210 printers.

3. Error Status Request:

- The list of possible errors on the 1510 and 1210 are different than the 40 series printers. This results in different bit masks that correspond to the different types of faults and warnings. If an external controller is monitoring for faults and warnings, the code will need to be changed to properly identify the faults. The traffic light status character is the same as the 40 series, so if you are monitoring only the traffic light status, the code will not need to be changed.

4. Stop Jet:

- The 1510 and 1210 have a “Stop Jet” command that will perform a clean stop when sent. This is not available on the 40 series printers.

5. Request part number:

- The response from the machine will obviously be different because the printer part numbers are different. It is important to note that the number of characters sent back will always be 16. If the printer’s part number is less than 16, the response will be padded with spaces.