DOMINO

Domino Ax-Series
Codenet Protocol

Ax150i

Ax350i

Ax550i

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DOMINO Ax-SERIES CODENET COMMUNICATIONS

This Codenet communications document, Domino Part No. EPT033760, specifies the protocol for communication between a remote controller and Ax-Series printers using Codenet protocol.

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AMENDMENT RECORD

Amendment	Date
All parts at Issue 1	August 2017

PART 1 : DESCRIPTION

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DESCRIPTION

Codenet is a communications protocol used in some of Domino's Continuous Ink Jet (CIJ) printers.

There are two versions of Codenet available:

Codenet 1 Used in the Domino Codebox, A-Series, A-Series plus and A-Series i-Tech printer ranges.

Codenet 2 Used in the Domino Ax-Series printer range. Codenet 2 is backwards compatible with Codenet 1 and includes additional 2 byte commands starting with 7D.

Form of Command

Note: The commands below are illustrated in both HEX and ASCII format.

Send to Printer

	ESC	**Command ID**	**Parameter**	**EOT**
ASCII	ESC			EOT
HEX	1B			04

Or

	ESC	**Command ID**	**Parameter**	**Payload**	**EOT**
ASCII	ESC			ESC xx …….. ESC } xx	EOT
HEX	1B			1B xx …….. 1B 7D xx	04

The payload can contain one or more embedded commands. Each starts with ESC (1B) or ESC } (1B7D) but has EOT (04) at the end. These can also have parameters. When the printer sees the EOT (04) it stops listening and all following bytes will be lost.

Return from Printer

ACK (06) or NAK (15) + Answer if applicable or Data if requested.

GENERAL

This section gives general information on the Codenet protocol described in this document.

- A positive acknowledgement (ACK) consists of a single character, (06).
- A negative acknowledgement (NAK) consists of four characters, (15xxx) where xxx is the type of error.
- Most commands come in two forms: a “setting” form that sends parameter information to the printer to set up a feature; or, a “query” form that asks the printer what the current settings of a parameter are.
- Most commands can be changed from the “setting” form to the “query” form by replacing the relevant parameter fields with a single “query” character, ? (3F).
- Many commands have either a head selection field or jet selection field. The head assignment field refers to the print head. For a printer with multiple ink jets, such as a duo printer, the head value 1 refers to the whole print head including both ink jets. The jet assignment field refers to individual ink jets.
- On a printer with a single print head, the head selection field should always be set to 1.
- The printer includes a feature where it will send an ACK/NAK at either of two points:
  ON RECEIVED – This returns ACK as soon as the printer has received the data. Note, the data has not yet been validated as correct.
  ON PROCESSED - This returns an ACK/NAK once the printer has processed the data.

For Printers Equipped with Duo Print Heads:

- The jet assignment field of a command is 1 for ink jet 1, and 2 for ink jet 2. Ink jet 1 is on the left when looking at the front of the print head.
- If the print head or ink jet number is invalid for the printer, the command will respond with NAK (15).

TYPES OF COMMANDS

Most commands are single byte, but some commands are double byte. Double byte commands are identified by the first byte in the command if:

- O (4F) = Extended = These were added when there were no more single bytes available to use.
- } (7D) = Codenet 2 = These will only work with the Ax-Series range of printers. NAK will be received from all other printer types.

The commands fall into two categories:

- Printer commands
- Label commands

Each category may have subcategories as described below.

Printer Commands

Initialisation Commands These commands perform functions such as requesting the printer's identity and setting up the real time clock, etc.

Print Control Commands These commands control operational features of the printer. For example, they identify which product detector to use for which print head. They also assign label stores to print heads and direct the loading of new print labels.

Printer Status Commands These commands allow the host system to control the unsolicited generation of status change reports and to obtain such reports on demand.

Global Format Commands These commands exert control over the orientation of printed labels and affect all characters printed.

Label Formatting Commands These commands are embedded within the text of stored print labels. Some of them affect the characters that follow until the end of the label, or until cancelled later in the label.

COMPATIBILITY GUIDE

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Software reset	03	<ETX>	Same as A-Series	Not supported	Not supported
User Function Execute	2A	*	Not supported	Not supported	Not supported
Insert label script	2B	+	New	Same as A-Series plus	Same as A-Series i-Tech
Insert padding spaces	3C	<	New	Same as A-Series plus	Same as A-Series i-Tech
External label select	40	@	Same as A-Series	Different For A-Series, the only valid names are 001-063. For A-Series plus A100, the names 001-127 can be used. For all others, 001-255 can be used.	Same as A-Series i-Tech
Continuous printing	5B	[	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
External serial number reset, rollover and update	5D	]	Same as A-Series	Same as A-Series plus	Supported but still under development
Auto invert	5C	\	Not supported	Not supported	Not supported
Read checksums	2141	!A	Not supported	Not supported	Not supported
Insert updatable text field	7C	|	New	Same as A-Series plus	Same as A-Series i-Tech
Insert language and calendar type date/ time	7D	}	Not supported	Not supported	New but still under development
Encoder frequency	7D40	}@	Not supported	Not supported	New
Encoder divide	7D41	}A	Not supported	Not supported	New
Source of encoder signal	7D42	}B	Not supported	Not supported	New

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Userport Setup	7D43	}C	Not supported	Not supported	New but still under development
Get codenet version number	7D44	}D	Not supported	Not supported	New
Switch the label monitor updating on or off	7D45	}E	Not supported	Not supported	New
Set size of FiFo data buffer	7D46	}F	Not supported	Not supported	New but still under development
Number of items in FiFo data buffer	7D47	}G	Not supported	Not supported	New but still under development
Connection count	7D48	}H	Not supported	Not supported	New
Reset ethernet connections	7D49	}I	Not supported	Not supported	New
Reset FiFo Data Buffer	7D4A	}J	Not supported	Not supported	New
External data queue expired entries ID	7D4B	}K	Not supported	Not supported	New but still under development
External data queue expired entries persistent count	7D4C	}L	Not supported	Not supported	New but still under development
Global label invert	7D4D	}M	Not supported	Not supported	New
Insert thin space of one stroke	7D4E	}N	Not supported	Not supported	New
Status reporting mode	30	0	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Status request	31	1	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Printer identity	41	A	Different Printer Type “22” for A100 plus and “23” for A300.	Same as A-Series plus	Different Printer Type “30” for Ax-Series

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Printer configuration	42	B	Different Max Msgs "255" for A300 plus and "127" for A100 plus. Baud rates 38400 (10), 57600 (11) and 115200 (12) are supported.	Same as A-Series plus.	Different Command retired.
Set the printer real time clock	43	C	Different Years less than 2001 are not supported.	Same as A-Series plus	Same as A-Series i-Tech
Read/load month name table	44	D	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Read/load day name table	45	E	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Print go delay	46	F	Different "0000" & "0001" read as "0002". Four or five digit delay is supported. Five digit delay is returned.	Same as A-Series plus	Same as A-Series i-Tech
Auto-repeat printing	47	G	Different This does not apply to the printed message. Instead, any messages subsequently created will include this setting.	Same as A-Series plus	Different Command retired.
Auto-reverse printing	48	H	Not supported	Not supported	Not supported

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Printing acknowledgement flags	49	I	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Flight time compensation	4A	J	Same as A-Series	Same as A-Series plus	Not supported
Product detector assignment	4B	K	Not supported	Not supported	Not supported
Product detect signal level	4C	L	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Product detect signal persistence time	4D	M	Different Persistence can be two or five digits. A five digit persistence is returned.	Same as A-Series plus	Same as A-Series i-Tech
Print go	4E	N	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Get label from store and put it online	50	P	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Head enable	51	Q	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Clear all labels	52	R	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Store label with name as 3 digits	53	S	Different. Max number of labels is 127 for an A100 plus and 255 for other variants.	Same as A-Series plus	Same as A-Series i-Tech
Product counts	54	T	Different The “prints since power up” counter can be reset and queries provided if it is configured as “resettable counter 2"	Same as A-Series plus	Same as A-Series i-Tech

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Read/Update Serial Number	55	U	Different For A-Series products, max number of labels is 063 For A-Series plus products, max number of labels is 127 for an A100 plus and 255 for other A-Series plus variants.	Same as A-Series plus.	Supported but still under development.
Stroke rate	56	V	Same as A-Series	Same as A-Series plus	Different. Returns the inverse of the UI value. e.g. 8000 will return 00125
Read modification level	57	W	Not supported	Not supported	Not supported
Load/Read Character Set	58	X	Not supported	Not supported	Not supported
Read/load alpha hours characters	59	Y	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Get software real-time clock	5A	Z	Same as A-Series	Different Command retired.	Not supported
Get current status	4F31	O1	Same as A-Series	Different Amber and red flashing now supported.	Same as A-Series i-Tech
Get current alert	4F32	O2	Not supported	Not supported	Not supported
Send data to FiFo buffer to fill an updatable text field	4F45	OE	New	Same as A-Series plus	Same as A-Series i-Tech

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Print height	4F48	OH	Different Applies to all printed labels.	Same as A-Series plus	Same as A-Series i-Tech
Store Bitmap	4F4C	OL	New	Same as A-Series plus	Same as A-Series i-Tech
Store labels with variable length name from the label store and put online	4F4D	OM	New	Same as A-Series plus	Same as A-Series i-Tech
Retrieve a label with a variable length name from the label store and put online	4F4E	ON	New	Same as A-Series plus	Same as A-Series i-Tech
Download label without save	4F51	OQ	Different For A-Series products, max number of labels is 063. 127 for an A100 plus and 255 for other A-Series Plus variants.	Same as A-Series plus	Same as A-Series i-Tech
Sequence ink jet on and off	4F53	OS	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Configure FiFo buffer to receive external data	4F50	OP	New	Same as A-Series plus	Same as A-Series i-Tech
External data queue expired entries config	4F56	OV	Not supported	Not supported	New
Read liquid levels	79	y	Same as A-Series	Different Range = 0 to 8	Same as A-Series i-Tech
Global label reverse	61	a	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Global label bold	62	b	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Global label double space	63	c	Different Global command	Same as A-Series plus	Same as A-Series i-Tech
Barcode thickness ration	66	f	Different Supports module width, space to module width and wide to module width ratios.	Same as A-Series plus	Same as A-Series i-Tech
Global print format	67	g	Different For label bold, double space and reverse individual characters "NNN" is returned. Setting label bold, double space and reverse individual characters is ignored.	Same as A-Series plus	Same as A-Series i-Tech
Character reverse	64	d	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Character invert	65	e	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Change unicode page	68	h	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Select character	69	i	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Insert serial number	6A	j	Different For A-Series and A-Series plus A100 there is a limit of 1 serial number per label. For other A-Series plus models there is a limit of 2 serial numbers per label.	Same as A-Series plus	Same as A-Series i-Tech
Start bold character and logos	6B	k	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Select 2nd Character Font	6C	l	Not supported	Not supported	Not supported
Insert logo	6D	m	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Insert date/time	6E	n	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Offset clock	6F	o	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Insert shift code	70	p	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Insert barcode	71	q	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Line separator	72	r	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Double space label element	73	s	Not supported	Not supported	Different This command will stop and start double space printing.
Select 1st Character Font	74	t	Not supported	Not supported	Not supported
Set character height	75	u	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech

Command Name	Hex	ASCII	A-Series plus Compared to A-Series	A-Series i-Tech Compared to A-Series plus	Ax-Series Compared to A-Series i-Tech
Stop bold characters	76	v	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Insert language date/time	77	w	Same as A-Series	Same as A-Series plus	Same as A-Series i-Tech
Insert bitmap	78	x	New	Same as A-Series plus	Same as A-Series i-Tech
2D Codes	7A	z	Different Has extra QR codes	Same as A-Series plus	Same as A-Series i-Tech

RETIRED COMMANDS

Commands that are no longer implemented. The list is produced in this document so that commands are not reused. If you already use the commands with certain printer software then these can still be used. Take care when upgrading the printer software as the command may no longer be available.

Description	**Command (Hex)**	**Command (ASCII)**
Software Reset	03	ETX
User Function Execute	2A	*
Printer Configuration	42	B
Flight Time Compensation	4A	J
Product Detector Assignment	4B	K
Auto-reverse Printing	48	H
Load/Read Character Set	58	X
Get Software Real Time Clock	5A	Z
Auto Invert Printing	5C	\
Select 2nd Character Font	6C	l
Select 1st Character Font	74	t
Read Checksums	2141	!A
Get Current Alert	4F32	O2

NEW COMMANDS IN DEVELOPMENT

The commands in the table below are new but still in development for the Ax-Series at the time of writing this document.

Description	HEX Command ID	ASCII Command ID
User Port Set Up	7D43	}C
Read/Update Serial Number	55	U
External Serial Number Reset, Rollover and Update	5D	]
Set Size of FiFo Data Buffer	7D46	}F
Number of Items in FiFo Data Buffer	7D47	}G
External Data Queue Expired Entries IDs	7D4B	}K
External Data Queue Expired Entries Persistent Count	7D4C	}L
Double Space Label Element	73	s
Insert Language and Calendar Type Date/Time	7D	}

HEX/ASCII CHARACTER LOOKUP TABLE

Hex Character	ASCII Character	Description
0	NUL	Null
1	SOH	Start of heading
2	STX	Start of text
3	ETX	End of text
4	EOT	End of transmission
5	ENQ	End of transmission
6	ACK	Enquiry
7	BEL	Bell
8	BS	Backspace
9	TAB	Horizontal tab
A	LF	NL line feed, new line
B	VT	Vertical tab
C	FF	NP form feed, new page
D	CR	Carriage return
E	SO	Shift out
F	SI	Shift in
10	DLE	Data link escape
11	DC1	Device control 1
12	DC2	Device control 2
13	DC3	Device control 3
14	DC4	Device control 4
15	NAK	Negative acknowledge
16	SYN	Synchronous idle
17	ETB	End of transmission block
18	CAN	Cancel
19	EM	End of medium
1A	SUB	Substitute
1B	ESC	Escape
1C	FS	File separator
1D	GS	Group separator

Hex Character	ASCII Character	Description
1E	RS	Record separator
1F	US	Unit separator
20	Space	Space
21	!	Exclamation mark symbol
22	"	Quotation mark symbol
23	#	Hash symbol
24	$	Dollar symbol
25	%	Percent symbol
26	&	Ampersand symbol
27	’	Apostrophe symbol
28	(	Left parenthesis symbol
29	)	Right parenthesis symbol
2A	*	Asterisk symbol
2B	+	Plus symbol
2C	,	Comma symbol
2D	-	Hyphen-minus symbol
2E	.	Full stop symbol
2F	/	Solidus (forward slash) symbol
30	0	Number zero
31	1	Number one
32	2	Number two
33	3	Number 3
34	4	Number four
35	5	Number five
36	6	Number six
37	7	Number seven
38	8	Number eight
39	9	Number nine
3A	:	Colon symbol
3B	;	Semicolon symbol
3C	<	Less than symbol

Hex Character	ASCII Character	Description
3D	=	Equals symbol
3E	>	Greater than symbol
3F	?	Question mark symbol
40	@	At symbol
41	A	Upper case letter A
42	B	Upper case letter B
43	C	Upper case letter C
44	D	Upper case letter D
45	E	Upper case letter E
46	F	Upper case letter F
47	G	Upper case letter G
48	H	Upper case letter H
49	I	Upper case letter I
4A	J	Upper case letter J
4B	K	Upper case letter K
4C	L	Upper case letter L
4D	M	Upper case letter M
4E	N	Upper case letter N
4F	O	Upper case letter O
50	P	Upper case letter P
51	Q	Upper case letter Q
52	R	Upper case letter R
53	S	Upper case letter S
54	T	Upper case letter T
55	U	Upper case letter U
56	V	Upper case letter V
57	W	Upper case letter W
58	X	Upper case letter X
59	Y	Upper case letter Y
5A	Z	Upper case letter Z
5B	[	Left square bracket symbol

Hex Character	ASCII Character	Description
5C	\	Reverse solidus (backward slash) symbol
5D	]	Right square bracket symbol
5E	^	Circumflex accent symbol
5F	_	Underscore (low line) symbol
60	‘	Grave accent symbol
61	a	Lower case letter a
62	b	Lower case letter b
63	c	Lower case letter c
64	d	Lower case letter d
65	e	Lower case letter e
66	f	Lower case letter f
67	g	Lower case letter g
68	h	Lower case letter h
69	i	Lower case letter i
6A	j	Lower case letter j
6B	k	Lower case letter k
6C	l	Lower case letter l
6D	m	Lower case letter m
6E	n	Lower case letter n
6F	o	Lower case letter o
70	p	Lower case letter p
71	q	Lower case letter q
72	r	Lower case letter r
73	s	Lower case letter s
74	t	Lower case letter t
75	u	Lower case letter u
76	v	Lower case letter v
77	w	Lower case letter w
78	x	Lower case letter x
79	y	Lower case letter y
7A	z	Lower case letter z

Hex Character	ASCII Character	Description
7B	{	Left curly bracket
7C	|	Vertical bar symbol
7D	}	Right curly bracket
7E	~	Tilde symbol
7F	DEL	Delete

PART 2 : SETUP

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SETUP

Depending on the hardware packs with which the printer is equipped, either Serial RS232 or an Ethernet TCP/IP interface can be used to send Codenet data packets to the printer.

This section describes how to connect a controller to the printer via ether the Serial RS232 or Ethernet TCP/IP interface.

CONNECTION VIA SERIAL RS232 INTERFACE

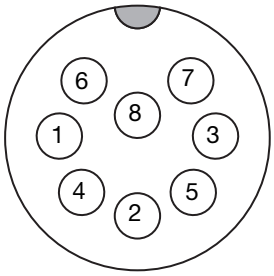
To enable Codenet communication with an Ax-Series printer via serial RS232, the printer must be equipped with the RS232 hardware pack.

RS232 Connector Pin Out

The RS232 connector pin out is shown below.

Table 1: J10 Pin Out

Pin	Signal	Description
1	RS232_DCD	Data Carrier Detect
2	RS232_TXD	Transmit Data Output
3	RS232_RXD	Receive Data Input
4	RS232_DSR	Data Set Ready Input
5	0V	Signal GND
6	RS232_DTR	Data Terminal Ready Output
7	RS232_CTS	Clear To Send Input
8	RS232_RTS	Request To Send Output
Shell	NC	EMC_GND via panel mounting



8-Way RS232 Port Connections (External View)

Serial RS232 Settings

To set the RS232 settings on an Ax-Series printer:

(1) On the TouchPanel, select *Home* > *Setup* > *Printer network* > *Serial.*

(2) The settings described in the table below can be set using the drop down boxes.

Table 2: RS232 Port Settings

Setting Name	Description
COM Port	Select *SerialCom1* for RS232 communication.
Baud rate	Select the baud rate between the printer and the device the printer is connected to. Range: 1200-115200 Default setting: 9600
Data bits	Select the number of data bits in each character. Default setting: 8
Parity	Select the type of parity bit that will be expected. A parity bit is an extra data bit that will be sent with each data character to detect errors in the transmission. Default setting: No parity *No parity* - No parity bit will be expected. *Odd* - An odd parity bit will be expected. *Even* - An even parity bit will be expected. *Mark* - The parity bit will always be 1 but will not be used. *Space* - The parity bit will always be 0 but will not be used.
Stop bits	Select the number of stop bits that will be sent at the end of each character to enable the detection of the end of the character. Default setting: 1

Table 2: RS232 Port Settings

Setting Name	Description
Flow control	Select the type of handshake signal that will be used to pause and resume the transmission of data. Default setting: RTS/CTS *Note: When the flow control state becomes <XOFF> from the printer, or NOT RTS, the printer will buffer characters received for processing up to 32. Any further characters will be discarded. Even though the printer requires data entry to be suspended, the printer will accept and process flow control state change requests or change in CTS state, and the software reset command <SW_RESET>* *None* - Flow control will not be enabled. *None, DTR Enabled* - • The DTR output line will be asserted (+12V) whenever the printer is ready to receive data. • The DTR output line will be de-asserted (-12V) whenever the printer is not ready for data entry. *DTR/DSR* - • The DTR output line will be asserted (+12V) whenever the printer is ready to receive data. • The DTR output line will be de-asserted (-12V) whenever the printer is not ready for data entry. • Whenever the DSR input line is asserted (+12V), the printer will be enabled for the sending of data. • Whenever the DSR input line is de-asserted (-12V), the printer will suspend data output. *RTS/CTS* - • The RTS output line will be asserted (+12V) whenever the printer is ready to receive data. • The RTS output line will be de-asserted (-12V) whenever the printer is not ready for data entry. • Whenever the CTS input line is asserted (+12V), the printer will be enabled for the sending of data. • Whenever the CTS input line is de-asserted (-12V), the printer will suspend data output. *XOn/XOff* - When XOn/Xoff is selected, CTS and RTS signals must not be connected. • The printer will send a single ASCII <XOFF> (013) character whenever it requires data entry to be suspended. • The printer will send a single ASCII (011) character whenever it becomes ready to receive data. • Whenever the printer receives an <XOFF> character it will suspend its data output. Transmission from the printer will be enabled whenever it receives an character.

(3) Restart the printer after the settings have been adjusted.

End of procedure.

Serial RS232 Codenet Protocol Settings

The settings described below are used to set the protocol type used for external communications.

To configure the protocol settings for Codenet via Serial RS232:

(1) On the printer's TouchPanel select *Home* > *Setup* > *Printer network* > *Advanced*.

(2) Select the *Protocol Setting* drop down setting and select *Codenet.*

(3) Select the *Protocol Mode* drop down setting and select *Serial.*

(4) Select the *Serial Com* setting and select *SerialCom2*.

(5) Tick the *Protocol Enabled* tick box.

(6) The settings described in the table below can be set:

Table 3: Serial RS232 Codenet Protocol Settings

Setting Name	Description
Response Length	Define the length of the response data package: *Variable* - ACK is one byte (06_{16}), and NAK is four bytes (15, A, B, C). Where A, B and C represent a three character Hex error code. *Fixed* - Both ACK and NAK are four bytes (06303030 and 15 A B C). Where A, B and C represent a three character Hex error code.
Send Response	Define when a response to a data packet will be sent from the printer. *On Processed* - The ACK or NAK will be sent when the printer has processed a data packet. *On Received* - An ACK will be sent as soon as the printer receives a data packet. Note, the data has not yet been validated as correct.
LED State	This setting allows the LEDs on the printer cabinet to mimic the behaviour of different printer types. This is useful if a different printer type is replaced with an Ax-Series printer. *Standard* - The LEDs on the printer cabinet will mimic the behaviour of A-Series i-Tech and A-Series plus printers. *Green + Flash* - The LEDs on the printer cabinet will mimic the behaviour of an A-Series classic printer.

Table 3: Serial RS232 Codenet Protocol Settings

Setting Name	Description
Printer ID	This setting allows the printer to respond using the ID of older printer types. This is useful if an older printer type is replaced with an Ax-Series printer, as the controller may be expecting a different response value. 00 = Codebox 01 = Solo 02 = Solo Twin Head 03 = A300 04-19 = Not Allocated 20 = Macrojet 21 = Casecoder 22 = A-Series plus A100 23 = A-Series plus A300 24 = A-Series plus Duo 25-29 = Not Allocated 30 = Ax-Series 31 - 99 = Not Allocated
Label Format	Select which label format/raster will be used when a data packet containing a label design is sent to the printer.
Backward Compatible	This tick box currently has no function. It may be removed in a later update of QuickStep.

(7) Restart the printer after the settings have been defined.

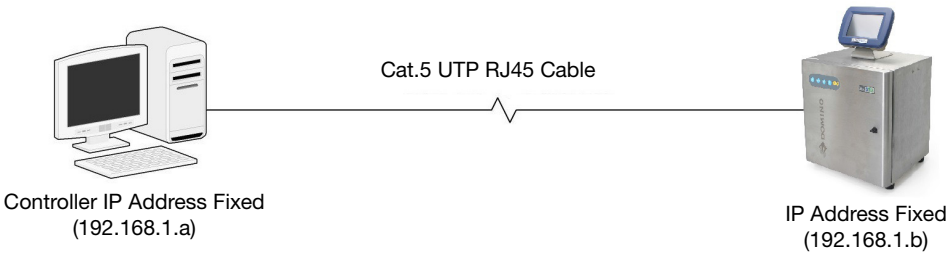
End of procedure.

CONNECTION VIA ETHERNET TCP/IP INTERFACE

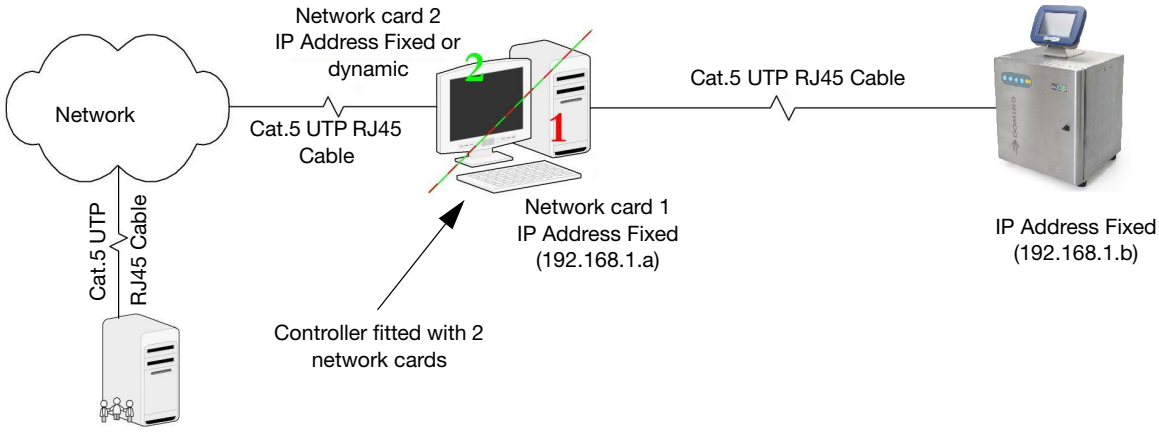
To enable Codenet communication with an Ax-Series printer via Ethernet TCP/IP interface, the printer must be equipped with the Basic Comms hardware pack.

Ensure the controller used for codenet communication has a fixed IP address in the same range as the printer's IP address.

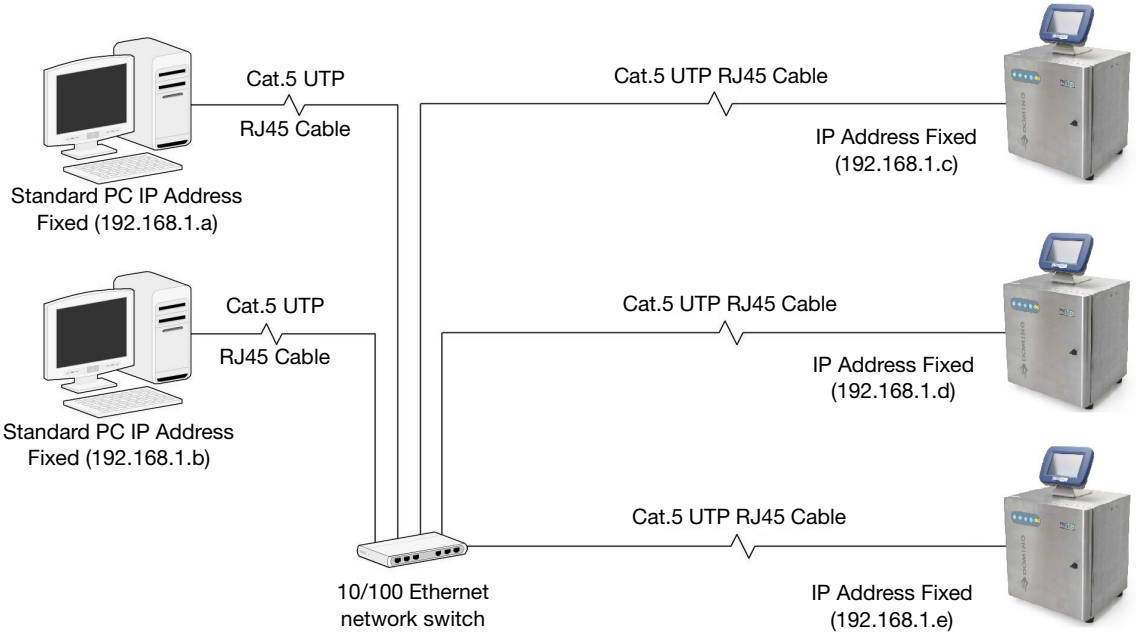
Refer to the illustrations below to connect a controller to the printer.



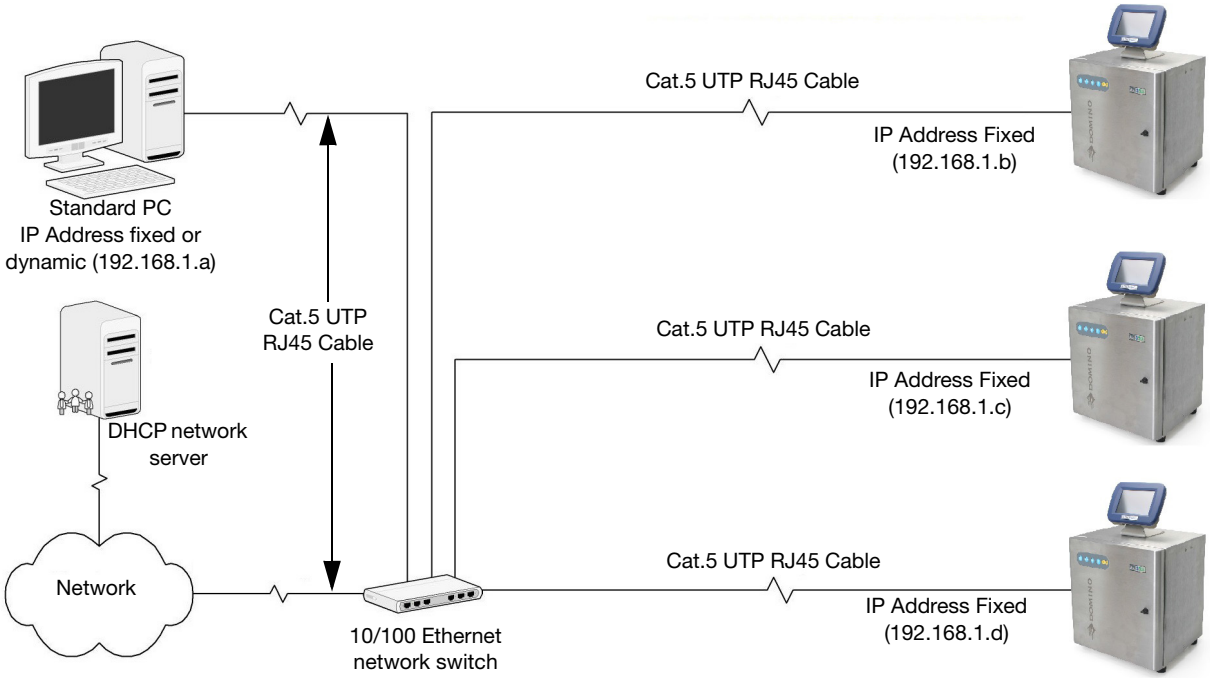
Single printer to single PC (max 1 printer) PC not connected to network



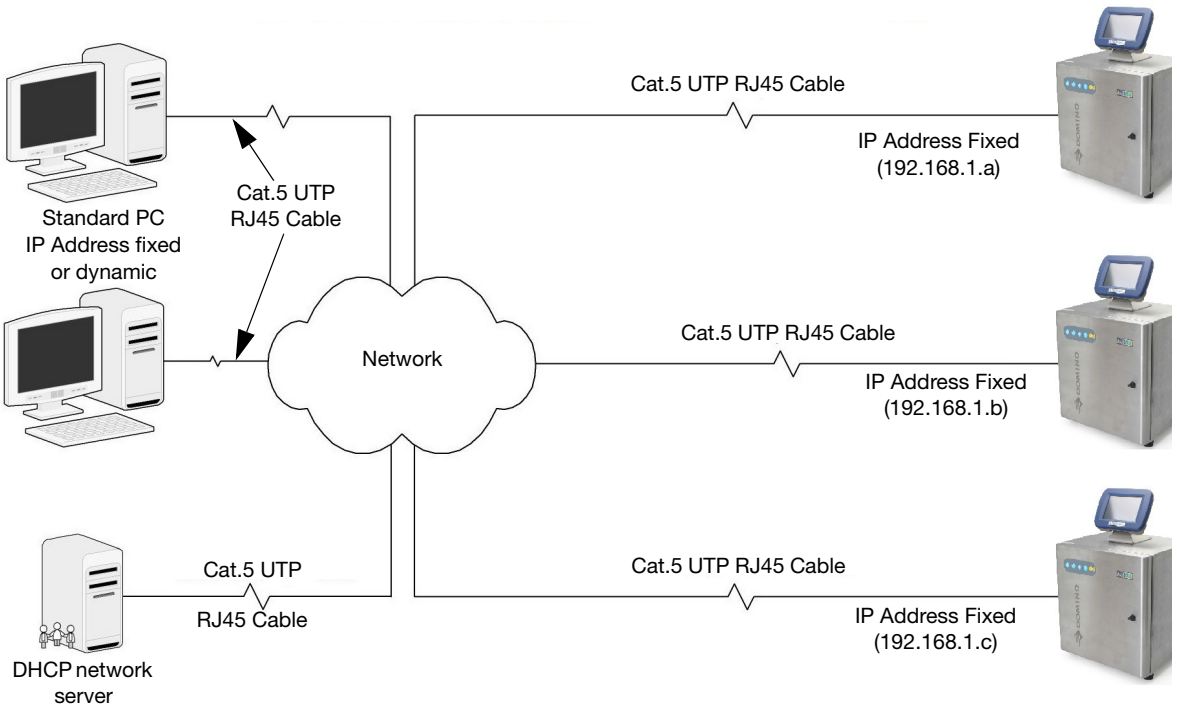
Single printer to single PC (max 1 printer) PC connected to network



Multiple printers to PC through switch. PC not connected to network



Multiple printers to PC through switch. PC connected to network



Multiple printers to PC through network

Ethernet TCP/IP Codenet Protocol Settings

The settings described below are used to set the protocol type used for external communications.

To configure the protocol settings for Codenet via Ethernet TCP/IP:

(1) On the printer's TouchPanel select *Home* > *Setup* > *Printer network* > *Advanced*.

(2) Select the *Protocol Setting* drop down setting and select *Codenet.*

(3) Select the *Protocol Mode* drop down setting and select *TCP.*

(4) Select the *TCP Port* setting and enter a TCP Port number.

Note: In an Ax-Series printer, four TCP ports, 7000, 7001, 7002 and 7004 are available for Ethernet TCP/IP communication. The default port is 7000.

(5) Tick the *Protocol Enabled* tick box.

(6) The settings described in the table below can be set:

Table 4: Ethernet TCP/IP Codenet Protocol Settings

Setting Name	Description
Response Length	Define the length of the response data package: *Variable* - ACK is one byte (06_{16}), and NAK is four bytes (15, A, B, C). Where A, B and C represent a three character Hex error code. *Fixed* - Both ACK and NAK are four bytes (06303030 and 15 A B C). Where A, B and C represent a three character Hex error code.
Send Response	Define when a response to a data packet will be sent from the printer. *On Processed* - The ACK or NAK will be sent when the printer has processed a data packet. *On Received* - An ACK will be sent as soon as the printer receives a data packet. Note, the data has not yet been validated as correct.
LED State	This setting allows the LEDs on the printer cabinet to mimic the behaviour of different printer types. This is useful if a different printer type is replaced with an Ax-Series printer. *Standard* - The LEDs on the printer cabinet will mimic the behaviour of A-Series i-Tech and A-Series plus printers. *Green + Flash* - The LEDs on the printer cabinet will mimic the behaviour of an A-Series classic printer.

Table 4: Ethernet TCP/IP Codenet Protocol Settings

Setting Name	Description
Printer ID	This setting allows the printer to respond using the ID of older printer types. This is useful if an older printer type is replaced with an Ax-Series printer, as the controller may be expecting a different response value. 00 = Codebox 01 = Solo 02 = Solo Twin Head 03 = A300 04-19 = Not Allocated 20 = Macrojet 21 = Casecoder 22 = A-Series plus A100 23 = A-Series plus A300 24 = A-Series plus Duo 25-29 = Not Allocated 30 = Ax-Series 31 - 99 = Not Allocated
Label Format	Select which label format/raster will be used when a data packet containing a label design is sent to the printer.
Backward Compatible	This tick box currently has no function. It may be removed in a later update of QuickStep.

(7) Restart the printer after the settings have been defined.

End of procedure.

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PRINTER INITIALISATION COMMANDS

Printer Identity – 'A' 41_h

This command instructs the printer to return it's variant type. It should be the first command sent to establish the communications link.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	A	?	EOT
HEX	1B	41	3F	04

Response to Query

	ESC	Command ID	Printer Type	SBC Software Part Number	SBC Software Issue Number	Codenet ID	EOT
ASCII	ESC	A	00 to 30	00000 to 99999	00 to 99	00	EOT
HEX	1B	41	3030 to 3330	3030303030 to 3939393939	3030 to 3939	3030	04

Printer Type: Two digits specifying the printer type.
00 (3030) = Codebox
01 (3031) = Solo
02 (3032) = Solo Twin Head
03 (3033) = A300
04-19 (3034-3139) = Not Allowed
20 (3230) = Macrojet
21(3231) = Casecoder
22 (3232) = A-Series plus A100
23 (3233) = A-Series plus A300
24 (3234) = A-Series plus Duo
25-29 (3235-3239) = Not Allocated
30 (3330) = Ax-Series
31-39 (3331-3939) = Not Allocated

Firmware Part: Five digits that specify the SBC software part number.

Firmware Issue: Two digits that specify the SBC software issue number.

Codenet ID: Two digit Codenet identity. No longer used. Always set to 00 (3030).

Examples of Usage

To printer:

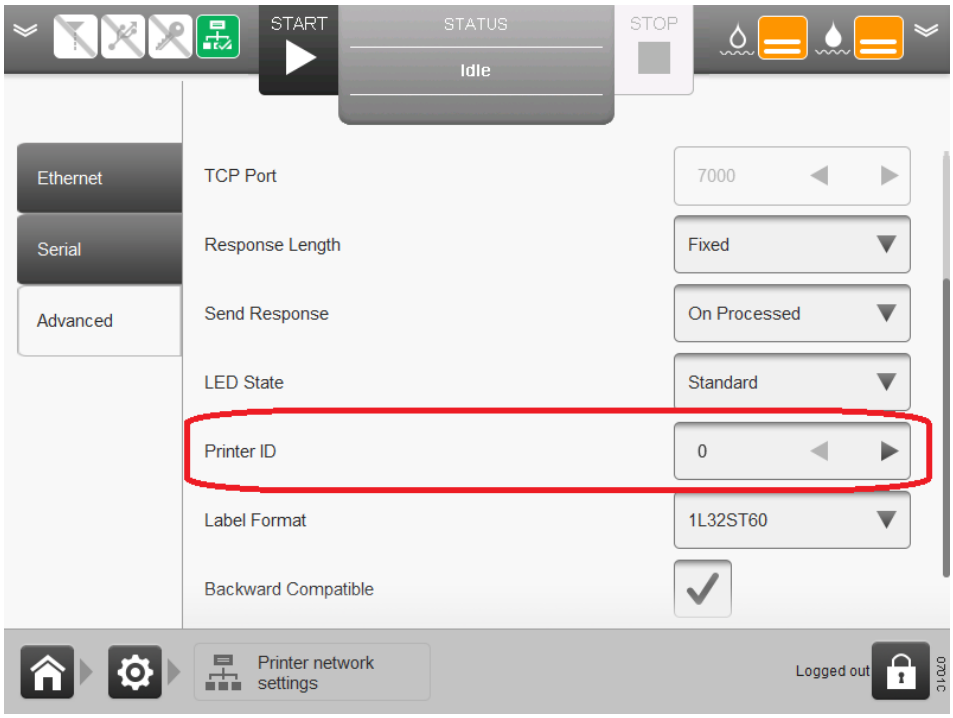
	ESC	Command ID	Payload	EOT
ASCII	ESC	A	?	EOT
HEX	1B	41	3F	04

From printer:

	ESC	Command ID	Printer Type		Build Part Number					Firmware		Not Used		EOT
ASCII	ESC	A	0	3	5	6	0	0	6	0	1	0	0	EOT
HEX	1B	41	30	33	35	36	30	30	36	30	31	30	30	04

Printer ID on User Interface

The printer type value can be changed so the printer can mimic other printer types. This is used when replacing an older printer and the controller asks for this information and is expecting a set value. As the controller is old, it cannot be updated with the new values. The Printer ID value can be changed by selecting *Home* > *Setup* > *Printer Network* > *Advanced*.



Printer ID Setting

Notes: (1) For an Ax-Series the SBC Part Number and SBC Version Number are not used. They are static data and will always return the same value.

(2) The Printer Type is dynamic and will return the value set in the UI.

Set the Printer Real Time Clock – 'C' 43_h

This command sets the printer's internal real time clock to the date and time given in the command parameters. Range is from 2001 to 2038. The printer's operating system does not use daylight savings. Therefore, the time returned may be one hour different to the actual time.

Set String Format

	ESC	Command ID	Century	Year of Century	Month of Year
ASCII	ESC	C	20 and above	00 to 99	01 to 12
HEX	1B	43	3230 and above	3030 to 3939	3031 to 3132

Day of Month	Not Used	Hour of Day	Minute of Hour	Second of Minute	EOT
01 to 31	Always set to 00	00 to 23	00 to 59	00 to 59	EOT
3031 to 3331	Always set to 30	3030 to 3233	3030 to 3539	3030 to 3539	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format:

	ESC	Command ID	Query Command	EOT
ASCII	ESC	C	?	EOT
HEX	1B	43	3F	04

Response to Query

Same as set string format with current values.

Read/Load Month Name Table – 'D' 44_h

This command allows the text strings used for month name entries to be set up or returned to the terminal.

Set String Format

	ESC	Command ID	Month 1 of Year	Month 2 of Year	Month 3 of Year
ASCII	ESC	D	AAA to zzz	AAA to zzz	AAA to zzz
HEX	1B	44	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Month 4 of Year	Month 5 of Year	Month 6 of Year	Month 7 of Year	Month 8 of Year
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Month 9 of Year	Month 10 of Year	Month 11 of Year	Month 12 of Year	EOT
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	EOT
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	04

Month 1 of year: Default = JAN (4A414E)

Month 2 of year: Default = FEB (464542)

Month 3 of year: Default = MAR (4D4152)

Month 4 of year: Default = APR (41552)

Month 5 of year: Default = MAY (4D4159)

Month 6 of year: Default = JUN (4A554E)

Month 7 of year: Default = JUL (4A554C)

Month 8 of year: Default = AUG (415557)

Month 9 of year: Default = SEP (534550)

Month 10 of year: Default = OCT (4F4354)

Month 11 of year: Default = NOV (4E4F56)

Month 12 of year: Default = DEC (444543)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	D	?	EOT
HEX	1B	44	3F	04

Response to Query

Same as set string format with current values.

Read/Load Day Name Table – 'E' 45_h

This command allows the text strings used for day name entries to be set up or returned to the terminal.

Set String Format

	ESC	Command ID	Day 1 of Week	Day 2 of Week	Day 3 of Week
ASCII	ESC	E	AAA to zzz	AAA to zzz	AAA to zzz
HEX	1B	45	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Day 4 of Week	Day 5 of Week	Day 6 of Week	Day 7 of Week	EOT
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	EOT
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	04

Day 1 of Week: Default = MON (6D6F6E)

Day 2 of Week: Default = TUE (545545)

Day 3 of Week: Default = WED (574544)

Day 4 of Week: Default = THU (544855)

Day 5 of Week: Default = FRI (465249)

Day 6 of Week: Default = SAT (534154)

Day 7 of Week: Default = SUN (53554E)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	E	?	EOT
HEX	1B	45	3F	04

Response to Query

Same as set string format with current values.

Read/Load Alpha Hours Characters – 'Y' 59_h

This command allows the 24 characters used with the Alpha Hour option to be set up or returned to the terminal.

Set String Format

	ESC	Command ID	Hour 1 of Day	Hour 2 of Day	Hour 3 of Day
ASCII	ESC	Y	AAA to zzz	AAA to zzz	AAA to zzz
HEX	1B	59	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Hour 4 of Day	Hour 5 of Day	Hour 6 of Day	Hour 7 of Day	Hour 8 of Day
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Hour 9 of Day	Hour 10 of Day	Hour 11 of Day	Hour 12 of Day	Hour 13 of Day
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Hour 14 of Day	Hour 15 of Day	Hour 16 of Day	Hour 17 of Day	Hour 18 of Day
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Hour 19 of Day	Hour 20 of Day	Hour 21 of Day	Hour 22 of Day	Hour 23 of Day
AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz	AAA to zzz
414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A	414141 to 7A7A7A

Hour 24 of Day	EOT
AAA to zzz	EOT
414141 to 7A7A7A	04

Hour 1 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is A
Hour 2 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is B
Hour 3 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is C
Hour 4 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is D
Hour 5 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is E
Hour 6 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is F
Hour 7 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is G
Hour 8 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is H
Hour 9 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is J
Hour 10 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is K
Hour 11 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is L
Hour 12 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is M
Hour 13 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is N
Hour 14 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is P
Hour 15 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is Q
Hour 16 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is R
Hour 17 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is S
Hour 18 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is T
Hour 19 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is U
Hour 20 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is V

Hour 21 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is W
Hour 22 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is X
Hour 23 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is Y
Hour 24 of Day:	1 character, A to z (41 to 7a), 1 to 9 (31 to 39) or <space> (20). Default is Z

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	Y	?	EOT
HEX	1B	59	3F	04

Response to Query

Same as set string format with current values.

Encoder Frequency – '}@' $7D_h$ 40_h

This Command will Get and Set the stroke rate of the internal shaft encoder.

The internal print frequency parameter is a division factor for a Timer/Counter in the original interface. The encoder frequency that is sent to the printer is calculated using the formula below:

Frequency = 11.0592 MHz / (2 * (1+Parameter) * 255)

Set String Format

	ESC	**Command ID**	**Internal Shaft Encoder Stroke Rate**	**EOT**
ASCII	ESC	}@	NUL NUL to ÿÿ	EOT
HEX	1B	7D40	0000 to FFFF	04

Internal Shaft Encoder Stroke Rate:	The current value of the stroke rate of the internal shaft encoder in Hz. 2 characters, NUL NUL to ÿÿ (0000 to FFFF)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	**Command ID**	**Query Command**	**EOT**
ASCII	ESC	}@	?	EOT
HEX	1B	7D40	3F	04

Response to Query

Same as set string format with current values.

Encoder Divide – '}A' $7D_h$ 41_h

This command will get and set the divide value that is used to scale down the external encoder frequency.

Set String Format

	ESC	Command ID	Encoder Divide Factor	EOT
ASCII	ESC	}A	NUL NUL NUL NUL to ÿÿÿÿ	EOT
HEX	1B	7D41	00000000 to FFFFFFFF	04

Encoder Divide: Four character encoder signal frequency divide factor.
NUL NUL NUL NUL to ÿÿÿÿ (00000000 to FFFFFFFF) MSB first.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	}A	?	EOT
HEX	1B	7D41	3F	04

Response to Query

Same as set string format with current values.

Source of Encoder Signal – '}B' $7D_h$ 42_h

This command will set the source of the encoder.

Set String Format

	ESC	Command ID	Source of Encoder Signal	EOT
ASCII	ESC	}B	0 or 1	EOT
HEX	1B	7D42	30 or 31	04

Source of Encoder Signal:	Single digit to set the source of the encoder signal. 0 (30) = Internal 1 (31) = External

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	}B	?	EOT
HEX	1B	7D42	3F	04

Response to Query

Same as set string format with current values.

Get Codenet Version Number – '}D' $7D_h$ 44_h

This command gets the current version of Codenet.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	}D	?	EOT
HEX	1B	7D44	3F	04

Response to Query

	ESC	Command ID	Codenet Version	EOT
ASCII	ESC	}D	NUL NUL NUL to ÿÿÿ	EOT
HEX	1B	7D44	000000 to FFFFFF	04

Codenet Version: Three characters displaying the Codenet version.
NUL NUL NUL to ÿÿÿ (000000 to FFFFFF)

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PRINTER CONTROL COMMANDS

Print Go Delay – 'F' 46_h

This command will set the delay between receiving a print go signal and starting printing. The delay is measured in stroke go pulses.

Note: Delay values of 0 and 1 are interpreted as 2.

Set String Format

	ESC	Command ID	Head Select	Delay Value	EOT
ASCII	ESC	F	1	00000 to 65535	EOT
HEX	1B	46	31	3030303030 to 3635353335	04

Head Select: 1 digit print head selection. This is always 1 (31) for an Ax-Series printer.

Delay Value: 4 digit delay value, 0000 to 9999 (30303030 to 39393939)
Default value is 0000 (30303030)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	F	1	?	EOT
HEX	1B	46	31	3F	04

Response to Query

Same as set string format with current values.

Auto-repeat Printing – 'G' 47_h

This command specifies the number of additional times that a label is printed for each print-go command signal, provided that the signal remains in the active state. Entering 99 (3939) signifies continuous printing while the print-go signal is active.

Note: Set is 4 bytes but query is 5 bytes

Set String Format

	ESC	Command ID	Head Select	Repeat Number	Repeat Pitch	EOT
ASCII	ESC	G	1	00 to 99	0000 to 9999	EOT
HEX	1B	47	31	3030 to 3939	30303030 to 39393939	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Repeat Number: 2 digit repeat number 00 to 99 (3030 to 3939)
99 (3939) = continuous
00 (3030) = default

Repeat Pitch: 4 digit repeat pitch.
0000 to 9999 (30303030 to 39393939) strokes
0000 (30303030) = default

Note: Pitch values of 0 and 1 are interpreted as 2

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	G	1	?	EOT
HEX	1B	47	31	3F	04

Response to Query

As set string format with current values.

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Printing Acknowledgement Flags – 'I' 49_h

This command instructs the printer to send a character from the serial port, or over the Ethernet interface of the printer after each printed label. The print acknowledgement is transmitted as the single character specified, without a command header or terminator.

Set String Format

	ESC	Command ID	Head Select	Acknowledgement Character	EOT
ASCII	ESC	I	1	Space, 1 to 4 or A to Z	EOT
HEX	1B	49	31	20, 31 to 34 or 41 to 5A	04

Head Select: 1 digit print head selection. This is always 1 (31) for Ax-Series.

Acknowledgement Character: 1 character that specifies the printer acknowledgment character.
Valid characters: 1 to 4 (31 to 34) or A to Z (41 to 5A).
<space> (20) = off
Default is off

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	I	1	?	EOT
HEX	1B	49	31	3F	04

Head Select: 1 digit print head selection. This is always 1 (31) for Ax-Series.

Response to Query

Same as set string format with current values.

Product Detect Signal Level – 'L' $4C_h$

This command selects the logic high or low level as the trigger for the Print Go signal.

Note: During first initialisation, or initialisation following the reset of the battery-backed memory, the printer monitors the product detect input and assumes that the values read correspond to their inactive states.

Set String Format

	ESC	Command ID	Head Select	Signal Level	EOT
ASCII	ESC	L	1	H or L	EOT
HEX	1B	4C	31	48 or 4C	04

Head Select: 1 digit print head selection. This is always 1 (31) for Ax-Series printer.

Signal Level: 1 character to specify the product detect signal level.
H (48) = High
L (4C) = Low

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	L	1	?	EOT
HEX	1B	4C	31	3F	04

Head Select: 1 digit print head selection. This is always 1 (31) for Ax-Series.

Response to Query

Same as set string format with current values.

Product Detect Signal Persistence Time – 'M' $4D_h$

This command sets the minimum time (number of print strokes) for which a change in the state of a product detect signal has to persist before it takes effect.

Note: As this is a number of strokes not real time care must be taken when the print signal is a fixed duration pulse and stroke pulses are from a shaft encoder, at low product speeds the print signal duration may not be long enough to initiate a print.

Set String Format

	ESC	Command ID	Which Product Detect	Minimum Persistence	EOT
ASCII	ESC	M	1 or 2	00000 to 65535	EOT
HEX	1B	4D	31 or 32	3030303030 to 3635353335	04

Which Product Detect:	1 digit product detect selection. For an Ax-Series, 1 and 2 (31 and 32) are the same.
Minimum Persistence	5 digit, minimum product detect signal persistence. Range: 0000 to 65535 (3030303030 to 3635353335)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Which Product Detect	Query Command	EOT
ASCII	ESC	M	1 or 2	?	EOT
HEX	1B	4D	31 or 32	3F	04

Which Product Detect:	1 digit product detect selection. For an Ax-Series, 1 and 2 (31 and 32) are the same.

Response to Query

Same as set string format with current values.

Print Go – 'N' $4E_h$

This command will initiate printing. The printer will behave in the same way as when a print-go signal is received from a product detect sensor.

Set String Format

	ESC	Command ID	Which Product Detect	EOT
ASCII	ESC	N	1 or 2	EOT
HEX	1B	4E	31 or 32	04

Which Product Detect:	1 digit product detect selection. For an Ax-Series, 1 and 2 (31 and 32) are the same.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Get label from store and put online – 'P' 50_h

This command is used to set or query a label on-line from the store if its slot ID is known. The label is put online from the current label store selected.

Set String Format

	ESC	Command ID	Head Select	Label Slot ID	EOT
ASCII	ESC	P	1	001 to 255	EOT
HEX	1B	50	31	303031 to 323535	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Label Slot ID: 3 digit label buffer selection.
Range: 001 to 255 (303031 to 323535).

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	P	1	?	EOT
HEX	1B	50	31	3F	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Response to Query

As set string format with current values.

Head Enable – 'Q' 51_h

This command will set the print head to enable or disable printing. The query returns the status of the print head.

Set String Format

	ESC	Command ID	Head Select	Head Enable	EOT
ASCII	ESC	Q	1	Y = Enable N = Disable	EOT
HEX	1B	51	31	59 = Enable 4E = Disable	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Head Enable 1 character print head enable.
Y (59) = Enable
N (4E) = Disable

Note: On a Duo print head, the command applies to both ink jets.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	Q	1	?	EOT
HEX	1B	51	31	3F	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series.

Response to Query

As set string format with current values.

Clear All Labels – 'R' 52_h

This command will take all labels off-line.

Set String Format

	ESC	Command ID	EOT
ASCII	ESC	R	EOT
HEX	1B	52	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Store Label with Name as 3 digits – 'S' 53_h

This command allows labels to be sent to the label store and stored using a 3 character/digit label name. The command also allows the contents of a label with a 3 character/digit label name to be queried.

Set String Format

	ESC	Command ID	Label Name	Label Data	EOT
ASCII	ESC	S	000 to 255	<Space> to <Delete>	EOT
HEX	1B	53	303030 to 323535	20 to 7F	04

Label Name: 3 digit label buffer number.
Range: 001 to 255 (303031 to 323535).

Label Data: Label data characters.
Valid characters: <Space> to <Delete> (20 to 7F) or embedded format commands.

Notes: (1) If the label name is in 3 digits then the label slot name is used as the slot number, so the label is saved as the "3 digit name".smg. If the name is saved as a three character name then the label slot number can differ from the label name.

(2) If the location (number) is already occupied on the printer, it will be overwritten.

(3) The label will be stored and read from the current label store selected.

(4) Requesting label name 000 (303030) will return the label from the editor.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Label Name	Query Command	EOT
ASCII	ESC	S	000 to 255	?	EOT
HEX	1B	53	303031 to 323535	3F	04

Label Name: 3 digit label buffer number.
Range: 001 to 255 (303031 to 323535).

Response to Query

Same as set string format with current values.

Worked Examples

Transfer a Simple Label to the Printer Store

To Printer:

	ESC	Command ID	Label Name			Label Data									
ASCII	ESC	S	9	9	9	H	e	l	l	o		W	o	r	l
HEX	1B	53	39	39	39	48	65	6C	6C	6F	20	57	6F	72	6C

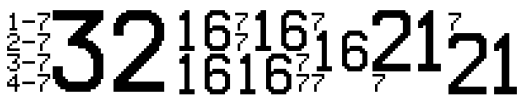
Label Data	EOT
d	EOT
64	04

From Printer:

ACK
06

Transfer a Complex Label to the Printer Store

We are going to create the following label and store it on the printer as a label named 123.



To Printer:

	ESC	Command ID	Label Name			ESC	Font Height		Label Data			ESC
ASCII	ESC	S	1	2	3	ESC	u	1	1	-	7	ESC
HEX	1B	53	31	32	33	1B	75	31	2D	37	1B	75

Font Height		Label Data		EOT	Font Height				CR		Label Data		Font Height			Label Data	
u	4	3	2	ESC	u	2	1	6	ESC	r	1	7	ESC	u	2	1	6
34	33	32	1B	1B	75	32	31	36	1B	75	31	37	1B	75	32	31	36

Note: The above command string continues on the next page.

Font Height			**Label Data**					**Font Height**			**Label Data**		**Font Height**			**Label Data**
ESC	u	1	7					ESC	u	3	2	1	ESC	u	1	7
1B	75	31	37	20	20	20	20	1B	75	33	32	31	1B	75	31	37

CR		**Font Height**			**Label Data**				**Font Height**			**Label Data**		**Font Height**		
ESC	r	ESC	u	1	2	-	7	7	ESC	u	2	1	6	ESC	u	3
1B	72	1B	75	31	32	2D	37	37	1B	75	32	31	36	1B	75	33

Label Data		**CR**		**Label Data**			**Font Height**			**Label Data**				**Font Height**		
2	1	ESC	r	3	-	7	ESC	u	2	1	6	1	6	ESC	u	1
32	31	1B	72	33	2D	37	1B	75	32	31	36	31	36	1B	75	31

Label Data	**CR**		**Font Height**			**Label Data**										**EOT**
7	ESC	r	ESC	u	1	4	-	7	7	7					7	EOT
37	1B	72	1B	75	31	34	2D	37	37	37	20	20	20	20	37	04

From Printer:

ACK
06

Transfer a label that embeds a serial number in a bar code and also prints the serial number as a number next to it as illustrated below. The bar code type used is 2 of 5 interleaved with no check sum.



To printer:

	ESC	**Command ID**	**Label Name**			**ESC**	**Insert Barcode**	**2 of 5 Interleaved no Checksum**	**ESC**
ASCII	ESC	S	7	8	9	ESC	q	2	ESC
HEX	1B	53	37	38	39	1B	71	32	1B

Insert Serial Number	**Serial Number ID**	**Not Batch Linked**	**Numeric Field Width**		**First Numeric Limit**	**1st Numeric Limit**					
j	1	N	0	6	0	0	0	0	0	0	0
6A	31	4E	30	36	30	30	30	30	30	30	30

2nd Numeric Limit						**Numeric Step Size**						**Has Leading Zeros**	**Insert Serial Number**
9	9	9	9	9	9	0	0	0	0	0	1	Y	j
39	39	39	39	39	39	30	30	30	30	30	31	59	6A

Serial Number ID	**Not Batch Linked**	**Numeric Field Width**		**1st Numeric Limit**						**2nd numeric Limit**						
2	N	0	6	0	0	0	0	0	0	9	9	9	9	9	9	9
32	4E	30	36	30	30	30	30	30	30	39	39	39	39	39	39	39

Numeric Step Size						**Has Leading Zeros**	**No Suffix or Prefix**	**Start Value**						
0	0	0	0	0	1	Y	N	0	0	0	6	7	8	9
30	30	30	30	30	31	59	4E	30	30	30	36	37	38	39

Note: The above command string continues on the next page.

Number of times each number will be repeat printed					**Numeric Steps**	**EOT**
0	0	0	0	0	N	EOT
30	30	30	30	30	4E	04

From Printer:

06
ACK

Product Counts – 'T' 54_h

This command resets or reads the specified product counter within the printer. Counter 2 (“Prints since power on”) can only be reset if it is configured to be persistent (“Resettable counter 2”). A negative acknowledgement NAK (15) will be returned on attempting to reset or query counter 2 if it is non-persistent (“Prints since power on”).

Note: The count is of photocell transitions and not necessarily the number of codes printed. For example, on an Ax-Series printer the ink jet might be off.

Set String Format

	ESC	Command ID	Counter ID	Reset	EOT
ASCII	ESC	T	1 or 2	0	EOT
HEX	1B	5	31 or 32	30	04

Counter ID: 1 digit to select the counter that will be reset.
1 (31) = Counter 1
2 (32) = Counter 2

Reset: 1 digit counter reset number 0 (30).

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Counter ID	Query Command	EOT
ASCII	ESC	T	1 or 2	?	EOT
HEX	1B	54	31 or 32	3F	04

Counter ID: 1 digit counter identity.
1 (31) = Counter 1
2 (32) = Counter 2

Response to Query

	ESC	Command ID	Counter ID	Query Response	EOT
ASCII	ESC	T	1 or 2	0000000000 to 9999999999	EOT
HEX	1B	54	31 or 32	30303030303030303030 to 39393939393939393939	04

Counter ID: 1 digit counter identity.
1 (31) = Counter 1
2 (32) = Counter 2

Query Response: 10 digit counter value with padded leading zeros.

Stroke Rate – 'V' 56_h

This command will return the current stroke rate.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	V	?	EOT
HEX	1B	56	3F	04

Response to Query

	ESC	Command ID	Stroke Rate	EOT
ASCII	ESC	V	00001 to 80000	EOT
HEX	1B	56	3030303031 to 3830303030	04

Stroke Rate: 5 digit stroke rate value.
Range: 00001 to 80000 (3030303031 to 3830303030)

For A-Series plus and i-Tech, this is the internal stroke rate setting.

In the Ax-Series, this returns the inverse value in the user interface, e.g. 8000 will return 00125.

A response of ????? means that the stroke rate exceeds the measurement capability of the printer, i.e. very slow stroke rate.

Some returns may be more than 5 character long.

Read Modification Level – 'W' 57_h

On Macrojet, Casecode and Codebox printers, this command is used by the pocket terminal to identify the functions allowed on a particular machine's software. This command currently serves no purpose on other printer types. This command has only been implemented to maintain compatibility with older controllers. If you are writing commands for a new controller, there is no need to implement this command.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	W	?	EOT
HEX	1B	57	3F	04

Response to Query

	ESC	Command ID	Modification Status	EOT
ASCII	ESC	W	2	EOT
HEX	1B	57	32	04

Note: The modification status will always return 2 for A-Series or Ax-Series products.

External Label Select – '@' 40_h

This command enables or disables external label selection. It will take the labels from the printer's label store and put them online by sending them to the Stroke Generator Board (SGB). Once on the SGB, use the parallel binary select lines to allow the selection of one of the labels to be printed.

Notes: (1) For Ax-Series the valid label select lines are 001-255.

(2) Label selection does not start at 000 as this is the currently printing label.

(3) Changing a label can take 250mS to 750mS depending on the type of data in the label.

(4) This facility is only available if MOD_STATE > 0.

Set String Format

	ESC	**Command ID**	**Enable or Disable**	**EOT**
ASCII	ESC	@	Y or N	EOT
HEX	1B	40	59 or 4E	04

Enable or Disable: Single character to enable of disable external label selection.
Y (59) = Enable
N (4E) = Disable.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	**Command ID**	**Query Command**	**EOT**
ASCII	ESC	@	?	EOT
HEX	1B	40	3F	04

Response to Query

Same as set string format with current values.

Continuous Printing – '[' $5B_h$

This command is similar to Auto Repeat, but printing will continue without needing to set a “Number to Print” field. More importantly, any clock or numbering data will be updated before each print. The pitch is from the front of one label to the front of the next label. The accuracy of the repeat pitch will be subject to many variables, especially the inclusion of clock and numbering, so accuracy cannot be guaranteed. Values of 0 and 1 are interpreted as 2.

Set String Format

	ESC	Command ID	Head Select	On or Off	Label Pitch	EOT
ASCII	ESC	[	1	Y or N	0000 to 9999	EOT
HEX	1B	55	31	59 or 4E	30303030 to 39393939	04

Head Select: 1 digit print head selection. This is always 1 (31) for an Ax-Series printer.

On or Off: 1 character to enable or disable.
Y (59) = Enable
N (4E) = Disable

Label Pitch: 4 digit inter label pitch
Range: 0000 to 9999 (30303030 to 39393939).

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	[	?	EOT
HEX	1B	55	3F	04

Response to Query

Same as set string format with current values.

Switch the Label Monitor Updating On or Off – '}E' $7D_h$ 45_h

This command will switch off the label preview being shown on the user interface. This feature may be useful when printing at high speed to ensure that the printer's resources are optimised for printing. When printing at high speeds the refresh rate of the screen will be too slow to view every preview anyway.

Set String Format

	ESC	Command ID	State of Label Monitor	EOT
ASCII	ESC	}E	1 or 0	EOT
HEX	1B	7D45	31 or 30	04

State of Label Monitor:
1 digit to enable or disable label monitoring.
1 (31) = Enable
0 (30) = Disable

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	}E	?	EOT
HEX	1B	7D45	3F	04

Response to Query

Same as set string format with current values.

Connection Count – '}H' $7D_h$ 48_h

Returns the number of Ethernet connections the printer has open. This number will include the local host connections if there are any.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	}H	?	EOT
HEX	1B	7D48	3F	04

Response to Query

	ESC	Command ID	Number of Connections	EOT
ASCII	ESC	}H	00 to 99	EOT
HEX	1B	7D48	3030 to 3939	04

Number of Connections: 2 digit that specify the number of open Ethernet connections.
Range: 00 to 99 (3030 to 3939)

Reset Ethernet Connections – '}I' $7D_h$ 49_h

This command will reset all open Ethernet connections to the printer. This includes Local Host connections.

Set String Format

	ESC	Command ID	EOT
ASCII	ESC	}I	EOT
HEX	1B	7D49	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Reset FIFO Data Buffer – '}J' $7D_h$ $4A_h$

This command will reset the FIFO buffer. This means that all data already in the buffer will be deleted.

Set String Format

	ESC	Command ID	Transport Stream	EOT
ASCII	ESC	}H	0 or 1	EOT
HEX	1B	7D4A	30 or 31	04

Transport Stream: One digit to specify the transport stream.
0 (30) = RS232
1 (31) = Ethernet

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negatives

PART 5 : PRINTER STATUS COMMANDS

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PRINTER STATUS COMMANDS

Status Reporting Mode – '0' 30_h

This command sets the mode for reporting printer status changes. This command switches the feature on or off, while command 31 allows you inspect them.

Set String Format

	ESC	Command ID	Unsolicited Reporting	Mode Control	EOT
ASCII	ESC	0	Y or N	0 to 7	04
HEX	1B	30	59 or 4E	30 to 37	EOT

Unsolicited Reporting: 1 digit to enable or disable unsolicited reporting.
Y (59) = Enable
N (4E) = Disable

Mode Control: 1 digit mode control.
0 (30) = No Error Reporting
1 (31) = Serial Interface Status
2 (32) = Fault Monitor Status
3 (33) = Serial Int. and Fault Monitor Status
4 (34) = Ink Monitor Faults
5 (35) = Serial Int. and Ink Monitor Status
6 (36) = Fault and Ink Monitor Status
7 (37) = Serial Int. Fault and Ink Monitor Status

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	0	?	04
HEX	1B	30	3F	EOT

Response to Query

Same as set string format with current values.

Status Request – '1' 31_h

This command will cause the printer to send its current or historical status, whether unsolicited reporting is enabled or not. Unsolicited status reports will be generated (without asking) if reporting is enabled and a change of status occurs. The printer buffers the last 16 status change reports in a FiFo queue until the request for historical status is received. The printer will transmit the oldest report that it has buffered and deletes it. If no reports have been buffered by the printer since the last status request was serviced, a single current status label will be returned to the host system. This is also the case when the current status is requested.

Query String Format

	ESC	Command ID	Query Type	Query Command	EOT
ASCII	ESC	1	H or C	?	04
HEX	1B	31	48 or 43	3F	EOT

Query Type: 1 character that identifies the status query type.
H (48) = Historical Status
C (43) = Current Status

Response to Query

	ESC	Command ID	Query Type	Current Status	Ink Jet
ASCII	ESC	1	H or C	000 to 999	0 to 3
HEX	1B	31	48 or 43	303030 to 393939	30 to 33

Status Change Time	EOT
0000 to 2359	04
30303030 to 32333539	EOT

Query Type: 1 character that identifies the status query type.
H (48) = Historical Status
C (43) = Current Status

Current Status: 3 digits that identify the printer status. See “Status Table” on page 5-5.
Range: 000 to 999 (303030 to 393939)

Ink Jet:	One digit to identify the ink jet. 0 (30) = not applicable 1 (31) = first ink jet 2 (32) = second ink jet on a duo print head 3 (33) = both ink jets on a duo print head
Status Change Time:	Four digit status change time in the format HHMM. Range: 0000 to 2359 (30303030 to 32333539)

Status Table

Status Number	Status Description	0xx Status changed from abnormal to normal	1xx Status changed to abnormal (Warning)	2xx Status changed to abnormal (Printing inhibited)	9xx Undefined status codes.
x00	Printer Ready	Normal	Fault		
x04	Charge circuit	Recovered	Failed		
x05	Solvent level	OK		Low	
x06	Solvent empty			Empty	
x07	Ink Level	OK	Low		
x08	24 Hours to Sump Expires	Yes			
x09	2 Hours to Sump Expires	Yes			
x10	Head Purge	Deactivated	Activated		
x11	Stroke Rate	OK	Too Fast		
x15	Second character set absent		Yes		
x16	Incompatible second character set		Yes		
x17	Missed output stroke(s) due to high stroke rate		Yes		

Status Number	Status Description	0xx Status changed from abnormal to normal	1xx Status changed to abnormal (Warning)	2xx Status changed to abnormal (Printing inhibited)	9xx Undefined status codes.
x18	Ink bag	OK	Empty		
x20	Ink monitor	Normal			
x21	Viscosity out of normal working range			Yes	
x22	Viscometer timed out			Yes	
x23	Wrong sump installed			Yes	
x24	Sump empty			Yes	
x25	Sump expired - supersedes sump 2 hours warning			Yes	
x26	EHT supply	Recovered		Failed	
x27	Ink on charge electrode	OK		Detected	
x28	Phase lock	Recovered		Lost	
x29	Charge circuit	Recovered		Tripped	
x30	Modulation	Recovered		Failed	
x31	Jet alignment	OK		misaligned	
x32	Temperature out of normal working range			Yes	
x33	Pressure out of normal working range			Yes	

Status Number	Status Description	0xx Status changed from abnormal to normal	1xx Status changed to abnormal (Warning)	2xx Status changed to abnormal (Printing inhibited)	9xx Undefined status codes.
x99	Undefined Alert				Yes

Read Liquid Levels – 'y' 79_h

This command will return the printer's current ink and make-up levels. To find out if the levels are Low, OK or High you will need to check the LEDs on the front panel on the printer's cabinet or look at the printer's user interface. An engineer certified by Domino can use a service key to find out the actual value ranges that have been set for each level if required.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	y	?	04
HEX	1B	79	3F	EOT

Response to Query

	ESC	Command ID	Ink Level	Make-up Level	EOT
ASCII	ESC	y	000 to 008	000 to 008	04
HEX	1B	79	303030 to 303038	303030 to 303038	EOT

Ink Level: Three digits that identify the ink level. If the value 021 (303231) is reported, the ink level sensor is unplugged.
Range: 000 to 008 (303030 to 303038)

Make-up Level Three digits that identify the ink level. If the value 021 (303231) is reported, the make-up level sensor is unplugged.
Range: 000 to 008 (303030 to 303038)

PART 6 : GLOBAL PRINTER FORMAT COMMANDS

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PRINTER GLOBAL FORMAT COMMANDS

Global commands act on every label when they are switched on.

Furthermore, global commands act in addition to embedded commands. For example, if the label is set with an embedded command to print bold and the global command is also set to print bold, a double bold label will be printed.

Label Reverse – 'a' 61_h

This command will cause all label fields in all labels to be printed in reverse until the command is switched off. For duo print heads, this setting applies to both ink jets.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	a	1	Y or N	04
HEX	1B	61	31	59 or 4E	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the global label reverse command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	a	?	04
HEX	1B	61	3F	EOT

Response to Query

Same as set string format with current values.

Label Bold – 'b' 62_h

This command will print all labels in bold characters until it is switched off.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	b	1	Y or N	04
HEX	1B	62	31	59 or 4E	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the global label bold command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	b	?	04
HEX	1B	62	3F	EOT

Response to Query

Same as set string format with current values.

Label Double Space – 'c' 63_h

This command will cause all labels to be printed with double spacing until it is switched off.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	c	1	Y or N	04
HEX	1B	63	31	59 or 4E	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the global label double space command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	c	?	04
HEX	1B	63	3F	EOT

Response to Query

Same as set string format with current values.

Character Reverse – 'd' 64_h

This command will cause each character to be printed in reverse, or forward if global label reverse is active until the command is switched off.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	d	1	Y or N	EOT
HEX	1B	64	31	59 or 4E	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the character reverse command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or,
NAK (15) = Negative

Character Invert – 'e' 65_h

This command causes characters to be printed upside down until the command is switched off.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	e	1	Y or N	EOT
HEX	1B	6	31	59 or 4E	04

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the character invert command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or,
NAK (15) = Negative

Barcode Thickness Ratio – 'f' 66_h

This command adjusts the ratio of bar and space element thickness employed in barcode printing. It allows the user to optimise the readability of printed barcodes.

Set String Format

	ESC	Command ID	Head Select	Barcode Type	Module Width
ASCII	ESC	f	1	1 to 4	1 to 10
HEX	1B	66	31	31 to 34	31 to 0A

Space to Module Width Ratio	Wide to Module Width Ratio	Not Used	EOT
1 or 2	0 to 8	0	04
31 or 32	30 to 38	30	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Barcode Type: 1 digit to select the barcode type.
1 (31) = Code 39
2 (32) = D2 of 5 Interleaved
3 (33) = USPS
4 (34) = EAN / UPC

Module Width: 1 digit module width.
Range: 1 to 10 (31 to 0A)

Space to Module Width Ratio: One digit space to module width ratio.
1 (31) = Ratio 1:1
2 (32) = Ratio 2:1

Wide to Module Width Ratio: One digit wide to module width ratio.
The ratio will be the wide ratio multiplied by the module width and rounded up to the nearest integer.
Range: 1 to 8 (30 to 38) meaning 2.0:1 to 2.8:1

Not Used: Always set to 0 (30).

Notes: (1) Code 39 - Element widths: Default module width is 1, space to module width ratio is 1:1 and wide to module width ratio is 2:1

(2) Interleaved 2 of 5 - Element widths: Default module width is 1, space to module width ratio is 1:1 and wide to module width ration is 2:1.

(3) EAN/UPC - Element widths: The widths can be increased or reduced only by changing the module width.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Barcode Type	Query Command	EOT
ASCII	ESC	f	1	1 to 4	?	04
HEX	1B	66	31	31 to 34	3F	EOT

Response to Query

As set string format with current values.

Global Print Format – 'g' 67_h

This command collectively sets the global attributes for printed label orientation.

Set String Format

	ESC	Command ID	Head Select	Reverse Label	Bold Label
ASCII	ESC	g	1	Y or N	Y or N
HEX	1B	67	31	59 or 4E	59 or 4E

Double Space Label	Invert Label	Not Used	EOT
Y or N	Y or N	N	04
59 or 4E	59 or 4E	4E	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Reverse Label: 1 digit to enable or disable the global reverse label command.
Y (59) = Enable
N (4E) = Disable

Bold Label: 1 digit to enable or disable the global bold label command.
Y (59) = Enable
N (4E) = Disable

Double Space Label: 1 digit to enable or disable the global double space label command.
Y (59) = Enable
N (4E) = Disable

Invert Label: 1 digit to enable or disable the global invert label command.
Y (59) = Enable
N (4E) = Disable

Not Used: Always set to N (4E).

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	g	1	?	04
HEX	1B	67	31	3F	EOT

Response to Query

As set format with current values.

Label Invert – '}M' $7D_h$ $4D_h$

This command will print all labels inverted until it is switched off. For Duo printers, this setting is common for both ink jets.

Set String Format

	ESC	Command ID	Head Select	Mode Control	EOT
ASCII	ESC	}M	1	Y or N	04
HEX	1B	7D4D	31	59 or 4E	EOT

Head Select: 1 digit print head selection. This will always be 1 (31) for an Ax-Series printer.

Mode Control: 1 character to enable or disable the global label invert command.
Y (59) = Enable
N (4E) = Disable

Response to Set

ACK (06) = Positive

or

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	}M	1	?	04
HEX	1B	7D4D	31	3F	EOT

Response to Query

As set format with current values.

PART 7 : LABEL FORMATTING COMMANDS

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LABEL FORMATTING COMMANDS

These commands are embedded within the text of individual labels. They have effect over parts of the printed label and are additional to any global format commands that may be active at the time of printing. Label formatting commands affect the specified label only.

Some of the commands in this group have no “End of Text” (04h) character and normally create no response from the printer. However, any unrecognised, out of range or invalid value entered, or an excessive label length will generate a negative acknowledgement when the next “End of Text” (04h) character is encountered.

Insert Label Script – '+' $2B_h$

This command is used to embed a custom script within a label. If the script doesn’t exist or the maximum number of scripts per label has been reached then a NAK (15) will be returned at the next EOT (04).

Set String Format

	ESC	**Command ID**	**Script Name**	**EOT**
ASCII	ESC	+	1..nn Byte	EOT
HEX	1B	2B	31..nn Byte	04

Script Name: The file name of the script including the file extension (.csf). The extension is used to show where the name ends. If this is omitted a NAK will be returned at the next EOT (04h).

Insert Padding Spaces – '<' $3C_h$

This command adds a specified number of padding spaces to a label. This allows the label to be printed in the correct position on the print surface.

This command is a shorthand method of adding spaces. Instead of adding 9 bytes in the format 202020202020202020, add 4 bytes ESC/</9/EOT (1B/3C/39/04). This adds less bytes of data allowing the printer to receive the label quicker.

Set String Format

	ESC	Command ID	Number of Spaces	EOT
ASCII	ESC	<	1 to 9	EOT
HEX	1B	3C	31 to 39	04

Number of Spaces:	1 digit, number of label padding spaces. Range: 1 to 9 (31 to 39)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Change Unicode Page – 'h' 68_h

By default, characters are from Unicode page number 00. The Unicode page number can be altered with the following command.

Set String Format

	ESC	Command ID	Page Number	EOT
ASCII	ESC	h	0A to Z9	EOT
HEX	1B	68	3041 to 5A39	04

Page Number: Two characters to specify the unicode page number.
Valid characters: 0A to Z9 (3041 to 5A39)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Worked Example

The string below will change the Unicode page to 4E.

	ESC	Command ID	Page Number	EOT
ASCII	ESC	h	4E	EOT
HEX	1B	68	3445	04

Select Character – 'i' 69_h

This command selects a specific character from the current Unicode page. The Unicode page can be set by using command 68, see page 7-5.

Set String Format

	ESC	Command ID	Character Number	EOT
ASCII	ESC	i	0A to Z9	EOT
HEX	1B	69	3041 to 5A39	04

Page Number: Two characters to identify the character number.
Valid characters: 0A to Z9 (3041 to 5A39)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Worked Example

The string below will select Unicode character 32 form the currently selected page.

	ESC	Command ID	Character Number	EOT
ASCII	ESC	i	32	EOT
HEX	1B	69	3232	04

Insert Serial Number – 'j' $6A_h$

This command adds a serial number to the label starting at the current line and column position, and with the current character attributes. The number of serial numbers, independent or batch linked, depends on the printer model.

Set Format:

	ESC	Command ID	Serial Number ID	Batch Linked	Numeric Field Width
ASCII	ESC	j	1 or 2	Y or N	00 to 16
HEX	1B	6A	31 or 32	59 or 4E	3030 to 3136

First Numeric Limit	Second Numeric Limit	Numeric Step Size	Print Leading Zeros	Prefix/Suffix Select
0..0 to 9..9	0..0 to 9..9	0..1 to 9..9	Y or N	P, S or N
30..30 to 39..39	3030..3030 to 3939..3939	30..31 to 39..39	59 or 4E	50, 53 or 4E

Number of Alpha Prefix/ Suffix Characters	Prefix/Suffix Characters 1st Limit	Prefix/Suffix Characters 2nd Limit	Size of Numeric + Alpha Field Width	Number of Times to Repeat Each Number
0, 1 or 2	AA to ZZ	AA to ZZ	AA0..0AA to ZZ9..9ZZ	00000 to 50000
30, 31 or 32	4141 to 5A5A	4141 to 5A5A	414130..304141 to 5A5A39..395A5A	3030303030 to 3530303030

Increment Alpha or Numeric	EOT
A or N	EOT
41 or 4E	04

Serial Number ID:	One digit to select the serial number identity. 1 (31) = One 2 (32) = Two
Batch Linked:	One character batch link flag. Y (59) = Enable (Y is only valid when Serial Number ID is 2) N (4E) = Disable
Numeric Field Width:	Two digit numeric field width. A value of 00 (3030) specifies an alpha only serial number. Range: 00 to 16 (3030 to 3136)
First Numeric Limit:	Number of digits depends on “Numeric Field Width” value. Range: 0..0 to 9..9 (30..30 to 39..39)
Second Numeric Limit:	Number of digits depends on “Numeric Field Width” value. Range: 0..0 to 9..9 (30..30 to 39..39)
Numeric Step Size:	Number of digits depends on “Numeric Field Width” value. Range: 0..0 to 9..9 (30..30 to 39..39)
Print Leading Zeros:	One character to enable or disable the printing of serial number leading zeros. If printing of leading zeros is disabled, spaces will be printed in place of zeros. Y (59) = Enable N (4E) = Disable
Prefix/Suffix Select:	One character to select prefix, suffix or none. P (50) = Prefix S (53) = Suffix N (4E) = None
Number of Alpha Prefix/Suffix Characters:	One number to select the number of prefix or suffix characters. A value of 0 (30) specifies a numeric only serial number. 0 (30) = Zero 1 (31) = One 2 (32) = Two
Prefix/Suffix Characters 1st Limit:	If “Number of Alpha Prefix/Suffix Characters” = zero, leave out. Range: AA to ZZ (4141 to 5A5A)
Prefix/Suffix Characters 2nd Limit:	If “Number of Alpha Prefix/Suffix Characters” = zero, leave out. Range: AA to ZZ (4141 to 5A5A)
Size of Numeric + Alpha Field Width	Start Value. Range: AA0..0AA to ZZ9..9ZZ (414130..304141 to 5A5A39..395A5A)
Number of Times to Repeat Each Number:	Five digit repeat printing count for each value. Range: 00000 to 50000 (3030303030 to 3530303030)
Increment Alpha or Numeric:	One character, step order selection. A (41) = Alpha N (4E) = Numeric

Notes: (1) For two batch linked numbers, number 2 will be stepped on by the rolling over of number 1. The "Batch Linked" field is always ignored for serial number 1. It is also ignored if serial number 2 is the only one entered.

(2) If the "Numeric Field Width" value is set to 00 (3030) and the "Number of Alpha Prefix/ Suffix Characters" value is set to 0 (30), the command will be rejected.

(3) For a serial number embedded in a barcode, leading zeros will always be printed and suppression will be ignored.

(4) If the "Prefix/Suffix Characters 1st Limit" value is less than the "Prefix/Suffix Characters 2nd Limit" value, then an incrementing number will be generated. If it is greater, a decrementing number will be generated. When both limits are equal, a fixed number will be generated.

(5) When using an Alpha increment, the Alpha prefix/suffix is incremented first. Whereas when using Numeric, the numeric part will increment first. Every label can have its own serial number associated with it. This serial numbering information is remembered for label "n". when the printer switches from printing label "n" to printing any other defined label. In this way, serial numbering of a product by label "n" can be resumed at a later stage from where it left off. The contents of the serial numbering definition together with the next serial number value to be printed for the label (in the start number field) will be read back whenever the stored label is used again.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Start Bold Characters and Logos – 'k' $6B_h$

After this command is entered, all characters and logos entered will be printed double width (each vertical stroke is printed twice). This is additional to any global commands set at the time of printing. It remains in force until the stop bold characters command is found.

Set String Format

	ESC	**Command ID**	**EOT**
ASCII	ESC	k	EOT
HEX	1B	6B	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Insert Logo – 'm' $6D_h$

This command inserts a monochrome bitmap (black and white .bmp) into a label. The bitmap must have a single character name. Domino logo files from older printers can be converted to bitmaps using the Domino Logo Editor.

Notes: (1) Before implementing a logo, the character height must be set to an appropriate height for the type of printer. Character height should be restored to the required value following logo entry. In the HEADER information for the logo there is a description field. The description field must contain a single character. This character is used in the protocol to insert the required logo.

(2) The number of logos per label is limited to 16.

Set String Format

	ESC	**Command ID**	**Logo Name**	**EOT**
ASCII	ESC	m	A to z or 1 to 9	EOT
HEX	1B	6D	41 to 7a or 30 to 39	04

Logo Name: One character to identity the logo.
A to z or 1 to 9 (41 to 7a or 30 to 39)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Insert Date/Time – 'n' $6E_h$

This command causes a specified date or time field to be inserted into the label. The date or time field will be inserted at the current line and column position with the current character attributes. The printed value will be derived from the printer's real time clock data. A maximum of 4 entries of each field type is permitted in each label, i.e. 1 per offset.

Set String Format

	ESC	Command ID	Clock ID Number	Date/Time Field Type	Date/Time Field Value
ASCII	ESC	n	1 to 4	See note table	See note table
HEX	1B	6E	31 to 34	See note table	See note table

Language Type	Calendar Type	EOT
0, 1 or 2	0 or 1	EOT
30, 31 or 32	30 or 31	04

Language type: One digit to specify the language type.
0 (30) = Latin
1 (31) = Arabic
2 (32) = Farsi

Calendar Type: One digit to specify the calendar type.
0 (30) = Gregorian
1 (31) = Jalali

Note Table

Date/Time Field Type			Date/Time Field Value		
Description	**ASCII**	**HEX**	**Description**	**ASCII**	**Hex**
Day of Month	A	41	Two digits	01 to 31	3031 to 3039
Day of Year	B	42	Three digits	001 to 366	303031 to 333636
Julian Year (Year of Decade)	C	43	One digit	0 to 9	30 to 39
Year (Year of Century)	D	44	Two digits	0 to 99	3030 to 3939
Year	E	45	Four digits	1979 to 2199	31393739 to 32313939
Month Number	F	46	Two digits	01 to 12	3031 to 3132

Date/Time Field Type			**Date/Time Field Value**		
Description	**ASCII**	**HEX**	**Description**	**ASCII**	**Hex**
Month (from command 'D' 44_h)	G	47	Three characters	AAA to zzz	414141 to 7A7A7A
Hours (Hours of the Day)	H	48	Two digits	00 to 23	3030 to 3233
Quarter Hours (From 00:00:00)	I	49	Two digits	01 to 96	3031 to 3936
Day (from command 'E' 45_h)	J	4A	Three characters	AAA to zzz	414141 to 7A7A7A
Week number (to BS47450)	K	4B	Two digits	01 to 53	3031 to 3533
Day number (from Mon to Sun)	L	4C	One digit	1 to 7	31 to 37
Minutes	M	4D	Two digits	00 to 59	3030 to 3539
Seconds	N	4E	Two digits	00 to 59	3030 to 3539
Alpha Hour (from command 'Y' $59_{h)}$	O	4F	One digit	A to z	
Julian Day (Feb 29 = Day)	P	50			

Notes: (1) Week numbering conforms to BS 4760 : 1971. (ISO/R 2015 “Numbering of Weeks”)

(2) Options “Month”, “Day” and “Alpha Hour” can be set using the commands INIT_DATE_MONTHS, INIT_DAYS, and INIT_ALPHA.

(3) Options “Month”, “Day” and “Alpha Hour” cannot be embedded within a barcode.

(4) The number of clock fields per label is limited to 16.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Offset Clock – 'o' $6F_h$

This command applies a user-supplied positive offset to date and time fields in the label.

Set String Format

	ESC	Command ID	Clock ID Number	Offset Type	Offset Value	EOT
ASCII	ESC	o	1 to 4	A to F	000 to 366	EOT
HEX	1B	6F	31 to 34	41 to 46	33030 to 333636	04

Clock ID Number: One digit clock selector.
Range: 1 to 4 (31 to 34)

Offset Type: One character offset type selector.
A (41) = Years
B (42) = Days
C (43) = Hours
D (44) = Minutes

Offset Value: Three digit offset value.
Range if "Offset Type Value" is Years: 000 to 099 (303030 to 303939)
Range if "Offset Type Value" is Days: 000 to 366 (303030 to 333636)
Range if "Offset Type Value" is Hours: 000 to 023 (303030 to 303233)
Range if "Offset Type Value" is Minutes: 000 to 059 (303030 to 303539)

Notes: (1) Before printing a label that includes embedded clock fields, the printer generates up to four label specific clocks by applying any clock offsets encountered in the label to the printer's system clock. The label specific clocks are then used to update any relevant clock strings in the print buffer.

(2) Current year and any year offset must be taken into consideration in order to allow for offset periods which straddle one or more leap days.

(3) Offset date/time command fields may occur at any point within the stored print label.

(4) Offsets reset to zero when another label is sent unless a new offset is requested in that label.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Insert Shift Code (Time Conditional Print String) – 'p' 70_h

This embedded format command allows the user to define a sequence of characters to be substituted in the label if the time of printing falls within a pre-defined pair of limits. This is useful for marking products on a work shift basis. A maximum of 5 characters is allowed in a time conditional string and up to 4 strings can be specified for each label. Time conditional strings may be grouped together for use as alternatives which are substituted at the time of printing.

Notes: (1) Where time conditional fields occur in the same place in the label, they will be interpreted as time conditional alternative print strings and the length of the longest one will be used to reserve print buffer space. In this case, if the time limit associated with the time conditional strings overlap each other, the string with the lower identity number will be the one printed.

(2) Start and end times will be compared at the time of printing with the printer's real time clock hours and minutes. This determines whether a time conditional string is to be substituted into the printed label.

(3) Outside of the active time limits for any of the entered time conditional strings their positions in the printed label will be printed as spaces to the same string length.

(4) Time conditional strings cannot be embedded within a barcode.

Set String Format

	ESC	Command ID	Number of Alternative Strings	Time Conditional String ID	Start Time
ASCII	ESC	p	1 to 4	1 to 4	0000 to 2359
HEX	1B	70	31 to 34	31 to 34	33030 to 32333539

End Time	String Length	Characters to be Printed	EOT
0000 to 2359	1 to 5	Any legal character (As String Length)	EOT
33030 to 32333539	31 to 35	Any legal character (As String Length)	04

Number of Alternate Strings:	One digit, number of alternate strings. Range: 1 to 4 (31 to 34)
Time Conditional String ID:	One character to identify the time conditional string. Range: 1 to 4 (31 to 34)
Start Time:	Four characters that define the start time. Range: 0000 to 2359 (30303030 to 32333539)
End Time:	Four characters that define the end time. Range: 0000 to 2359 (30303030 to 32333539)

String Length:	One character that defines the length of the print string. Range: 1 to 5 (31 to 35)
Characters to be Printed:	Characters to be printed, the number of characters depends on the string length value. Any legal characters can be used.

Response to Set

ACK (06) = Positive

or,

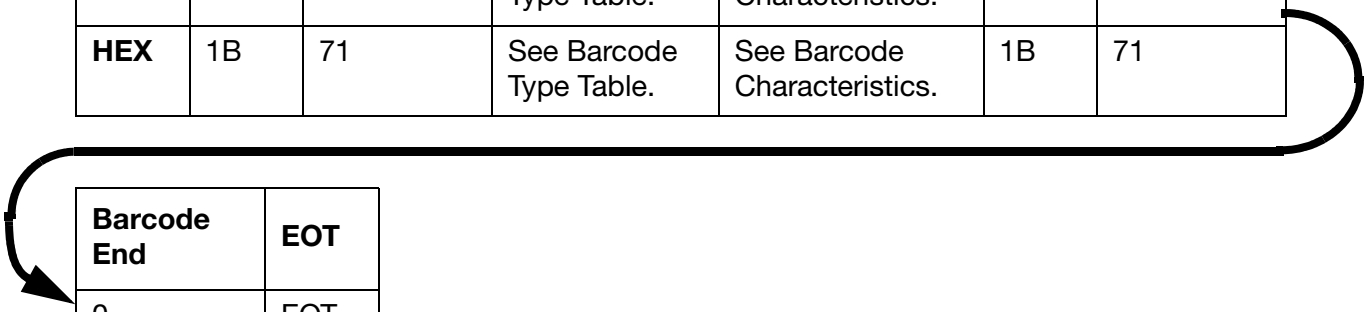
NAK (15) = Negative

Insert Barcode – 'q' 71_h

This command will cause the following text to be printed in bar encoded format until a matching terminating command is encountered. The barcode must be terminated with the relevant terminator.

Set String Format

	ESC	Command ID	Barcode Type	Barcode Data	ESC	Command ID
ASCII	ESC	q	See Barcode Type Table.	See Barcode Characteristics.	ESC	q
HEX	1B	71	See Barcode Type Table.	See Barcode Characteristics.	1B	71



Barcode End	EOT
0	EOT
30	04

Note: Before entering a barcode start command, the character height must be set to the maximum height applicable to the type of printer. The character height should be restored to the required value following entry of the corresponding barcode end command.

Barcode Type

Description	ASCII	HEX
Code 39	1	31
2of 5 Interleaved, No checksum	2	32
USPS (Not yet implemented)	3	33
EAN/UPC	4	34
Codabar (Not yet implemented)	5	35
Code 128 code set B	6	36
2 of 5 Interleaved, Modulus 10 factor 3 checksum	7	37
Code 128 Auto code set ABC	8	38
Code 93 (Automatic calculation of check digits)	9	39

Barcode Characteristics

Code 39

Character set: 0 to 9 A to Z space - . $ / + % start / stop characters (see notes).

Element widths: narrow 1, wide 3 (See Note).

Nominal widths: Each character consists of 3 wide + 5 narrow.

Notes: (1) For display purposes, the start/stop character is usually shown as an asterisk "".*

(2) The inter character gap is set to 1 narrow space.

(3) The default barcode ratio and inter character gap are set to 2:1 and 1:1. The module width can be changed using the barcode thickness command.

Interleave 2 of 5

Character set: 0 to 9, start, stop (generated by the Ink Jet).

Element widths: narrow = 1, wide = 3 (See Note).

Nominal widths: start pair 8, digit pair 18, stop pair 10.

Note: The label starts with a pair of start characters, 8 elements. All digits are printed as pairs, therefore there must be an even number of digits. If an uneven number is specified then add a leading zero. The label ends with a pair of stop characters, 10 elements.

Codabar (Not Yet Implemented)

Character set: 0 to 9 - $: / . + and 4 start / stop characters.

Element widths: narrow = 1, wide = 3.

Nominal widths: 0-9 - $ 11 elements all others 13 elements.

Code 128

Character set is codeset B, alphanumeric and punctuation.

A modulo-103 check digit is added by default.

Code 128 Auto

Character set is codeset A, B, C, alphanumeric and punctuation. The codeset selection is handled automatically by the printer.

A modulo-103 check digit is added by default.

EAN/UPC

Character set: 0 to 9

Element widths: narrow = 1, med.1 = 2, med.2 =3, wide = 4

Nominal widths: 7 elements.

EAN 8 $ [5 dig. manf. code] [2 dig. art. code] [chk dig.] $

EAN13 @ [nat.dig.] [6 dig.manf. code] [5 dig.art. code] [chk.dig] @

UPC12 & [6 dig. manf. code] [5 dig. art. code] [chk.dig.] &

Notes: (1) Logos, time conditional clock and clock fields "GG" "JJ" and "O" are not allowed.

(2) With EAN and UPC bar codes the check digit must be included as the software does not calculate it. However, when the data is read back via comms it will not return the checksum, just the data.

(3) Only simple numbers are allowed in EAN and UPC barcodes. No clock, serial numbers or updateable text fields etc.

Line Separator – 'r' 72_h

This command will cause the text that follows to be entered on the following line starting at the first unoccupied column position.

Set String Format

	ESC	Command ID
ASCII	ESC	r
HEX	1B	72

Note: After receiving a line separator character, the software will revert to the default of non-bold first character set. Therefore, an attribute set in one line must be set again if required for the next line.

Set Character Height – 'u' 75_h

Characters entered following this command will be printed with the specified height if valid and available. Not all print formats have all character sets present.

Set String Format

	ESC	Command ID	Character Height
ASCII	ESC	u	1, 2 or 3
HEX	1B	75	31, 32 or 33

Stop Bold Characters – 'v' 76_h

Characters entered following this command will be printed single width (each vertical stroke is printed once). This has no effect on any additional global commands in force at the time of printing.

Set String Format

	ESC	Command ID
ASCII	ESC	v
HEX	1B	76h

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Insert Language Date/Time – 'w' 77_h

This command is similar to the Insert Date/Time command on page 7-12, but has an additional field to define which counting format is used.

Set String Format

	ESC	Command ID	Clock Selector	Clock Type
ASCII	ESC	w	1 to 4	A to P (See Clock Type Table)
HEX	1B	77	31 to 34	41 to 50 (See Clock Type Table)

Language Type	EOT
1 or 2	04
31 or 32	EOT

Clock Selector: One digit that selects the clock.
Range: 1 to 4 (31 to 34)

Clock Type: One character that defines the clock type, see "Clock Type" table for full details.

Language Type: One character that defines the language type.
0 (30) = Gregorian
1 (31) = Jalali

Clock Type			
ASCII	**HEX**	**Description**	**Printed Range**
A	41	Day of Month	01 to 31
B	42	Day of Year	001 to 366
C	43	Julian Year (Year of Decade)	0 to 9
D	44	Year (Year of Century)	00 to 99
E	45	Year	1979 to 2199
F	46	Month Number	01 to 12
G	47	Month (from command 'D' 44_h)	JAN to DEC
H	48	Hours (Hours of the Day)	00 to 23
I	49	Quarter Hours (from 00:00:00)	01 to 96
J	4A	Day (from command 'E' 45_h)	MON to SUN

Clock Type			
K	4B	Week number (to BS47450)	01 to 53
L	4C	Day number (from Mon to Sun)	1 to 7
M	4D	Minutes	00 to 59
N	4E	Seconds	00 to 59
O	4F	Alpha Hour (from command 'Y' $59_{h)}$	A to Z (or user defined)
P	50	Julian Day (Feb 29 = Day)	001 to 366

Notes: (1) Week numbering conforms to BS 4760 : 1971. (ISO/R 2015 “Numbering of Weeks”)

(2) Options “Month”, “Day” and “Alpha Hour” can be set using the commands 'D', 'E', and 'Y'.

(3) Options “Month”, “Day” and “Alpha Hour” cannot be embedded within a barcode.

(4) For an A-Series plus The number of clock fields per label is limited to 16.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Insert Bitmap – 'x' 78_h

This command causes the specified pre-stored bitmap to be inserted into the print label starting at the current line and column position. This is similar to the insert logo command on page 7-11 with the difference that any bitmap with a name up to five characters can be inserted.

Note: Prior to implementing a bitmap, character height must be set to the appropriate height for the type of printer. Character height should be restored to the required value following bitmap entry.

Set String Format

	ESC	Command ID	Bitmap Name Length	Bitmap Name	EOT
ASCII	ESC	x	1 to 5	0 to 9 and A to z (1 to 5 characters)	04
HEX	1B	78	31 to 35	30 to 39 and 40 to 7A (1 to 5 characters)	EOT

Bitmap Name Length: 1 digit to define the length of the bitmap name. Range: 1 to 5 (31 to 35)

Bitmap Name: The name of the bitmap file, 1 to 5 characters long. Characters 0 to 9 (30 to 39) and A to z (40 to 7A) can be used.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

2D Codes – 'z' $7A_h$

This command will cause the following text to be printed in 2-D code format until a matching terminating command is encountered. The 2-D code must be terminated with the relevant terminator. Unlike the barcode command each 2-D code has its own independent attribute block. Up to 4 different 2-D codes can be inserted into a label.

Notes: (1) QR Codes must be square. For example, the Columns and Rows values must be the same.

(2) When Columns = 00 (3030) and Rows = 00 (3030) the printer will choose the largest possible size for the 2D code that fits the currently selected label format.

(3) Certain combinations of size and magnification, (E.g. 16x48 and x4) are unavailable. Both 0 (30) and 1 (31) denote x1 magnification (default) to the 2D code.

Set String Format

	ESC	Command ID	Barcode Type	Data Type	Error Correction
ASCII	ESC	z	0, 1 or 2	0 to 6	00 to 10 or 26
HEX	1B	7A	30, 31 or 32	30 to 36	3030 to 3130 or 3236

Rows	Column	Magnification	Vertical Alignment	Unused 1
00 to 99	00 to 99	1 to 4	0 or 1	0
3030 to 3939	3030 to 3939	30 to 34	30 or 31	30

Unused 2	Data	ESC	Command ID	End	EOT
0	Any Valid Characters	ESC	z	0	04
30	Any Valid Characters	1B	7A	30	EOT

Barcode Type: One digit to specify the barcode type or end the dot code.
0 (30) = Barcode terminator
1 (31) = Data Matrix
2 (32) = QR Code

Data Type: One digit to specify the data type.

Data Matrix:
0 (30) = Numeric only
1 (31) = Alpha only
2 (32) = Alpha numeric
3 (33) = Upper case only
4 (34) = Lower case only
5 (35) = Punctuation
6 (36) = 8 bit ASCII

QR Code:
1 (31) = Model 1
2 (32) = Model 2

Error Correction: Two digits to specify the error correction code.

Data Matrix:
00 (3030) = 000
01 (3031) = 010
02 (3032) = 040
03 (3033) = 050
04 (3034) = 060
05 (3035)
06 (3036) = 080
07 (3037)
08 (3038) = 100
10 (3130) = 120
26 (3236) = 200

QR Code:
00 (3030) = L
01 (3031) = M
02 (3032) = Q
03 (3033) = H

Rows: Two digit number of rows. QR Codes must be square, i.e. the Rows and Column value must be the same.

Data Matrix:
00 to 99 (3030 to 3939)

QR Code:
21, 25 or 29 (3231, 3235 or 3239)

Column: Two digit number of columns. QR Codes must be square, i.e. the Rows and Column value must be the same.

Data Matrix:
00 to 99 (3030 to 3939)

QR Code:
21, 25 or 29 (3231, 3235 or 3239)

Magnification: One digit magnification value. Certain combinations of dotcode sizes and magnification are unavailable. e.g. 16x48 and x4. Both 0 and 1 denote a x1 magnification (default) to the 2D code.

Datamatrix:
0 to 4 (30 to 34)

QR Code:
0 to 1 (30 to 31)

Verticle Alignment: One digit field alignment value. This value will align the 2D code bitmap to the top or bottom.
0 (30) = Align to top (default)
1 (31) = Align to bottom

The following example shows a 2D code of 10 rows aligned at the top and bottom respectively.



Unused 1: One digit, unused field, always set to 0 (30).

Unused 2: One digit, unused field, always set to 0 (30).

Data:

End: One digit stop command.
Always set to 0 (30).

Example – Data Matrix

	ESC	Command ID	Store Number	ESC	Select 2nd font size of 16 drops
ASCII	ESC	OQ	001	ESC	u2
HEX	1B	4F51	303031	1B	7532

ESC	Command ID	Start	Numeric Only	ECC of 200
ESC	z	1	0	26
1B	7A	31	30	3236

Number of Rows	Number of Columns	Magnification	Align to Top	Unused 1
16	16	1	0	0
3136	3136	31	30	30

Unused 2	Barcode Data	ESC	Command ID	Stop
0	1234	ESC	z	0
30	31323334	1B	7A	30

Return Cursor to Known Position	EOT
ESC u 1 ESC r ESC r ESC r	04
1B75311B721B721B72	EOT

Example – QR Code

	ESC	Command ID	Store Number	ESC	Select 4th font size of 16 drops
ASCII	ESC	OQ	001	ESC	u4
HEX	1B	4F51	303031	1B	7534

ESC	Command ID	Start	Model	Error Level
ESC	z	2	2	00
1B	7A	32	32	3030

Number of Rows	Magnification	Align to Top	Unused 1	Unused 2
29	1	0	0	0
3239	31	30	30	30

Unicode Data = 脸01	ESC	Command ID	Stop	EOT
814000300031	ESC	z	0	04
38313430 30303330 30303331	1B	7A	30	EOT

Insert Updatable Text Field – '|' $7C_h$

This command inserts an updatable text field into the label. The field can be populated with data sent via Ethernet or RS232 using the External Protocol to fill the serial buffer with data.

Set String Format

	ESC	Command ID	Bitmap Name Length	External Data Delimiter	Offset Within External Data Buffer
ASCII	ESC	|	0001 to 1024	00 to 7D (HEX)	0000 to 1023
HEX	1B	7C	30303031 to 31303234	3030 to 3744	30303030 to 31303233

Index	Comms Method	EOT
01 to 16	0 or 1	04
3031 to 3136	30 or 31	EOT

Bitmap Name Length	Four digits to specify the bitmap length name. Range: 0001 to 1024 (30303031 to 31303234)
External Data Delimiter	Two hex characters that specify the external data delimiter. 2C (3243) will insert a comma. 00 (3030) implies that the external data is not delimited. If set to 00 (3030) then the offset will be used to extract the set of data from the external data buffer. Range: 00 to 7D (3030 to 3744).
Offset Within External Data Buffer:	Four digits that specify the offset within external data buffer. Range: 0000 to 1023 (30303030 to 31303233)
Index:	Two digits that specify the index, used for delimited data only. Range: 01 to 16 (3031 to 3136).
Comms Method	One digit that specifies the method used to fill the external data buffer with data. 0 (30) = RS232 1 (31) = Ethernet

Example 1

Set the field up inside a label in the printer. Normally used for a label with a single updatable text field.

The external data sent to the buffer is 0123456.

The data printed is 123.

	ESC	Command ID	Updatable Text Field Length	Delimiter	Offset within external data buffer
ASCII	ESC	|	0003	00	0001
HEX	1B	7C	30303033	3030	30303031

Index	Comms Method	EOT
01	1	04
3031	31	EOT

Updatable Text Field Length:	Set to 0003.
Delimiter:	Set to 00, no delimiter.
Offset within external data buffer:	Set to 0001 to ignore the first item and start from the second.
Index:	Set to 01, default as it is not used in this example.
Comms Method:	Set to 1 for Ethernet.

Example 2

Set the field up inside a label in the printer. Normally used for a label with multiple updatable text fields.

The external data sent to the buffer is 0123,456,ABCD.

The data that gets printed is ABCD.

	ESC	Command ID	Updatable Text Field Length	Delimiter	Offset within external data buffer
ASCII	ESC	|	0004	2C	0000
HEX	1B	7C	30303034	3243	30303030

Index	Comms Method	EOT
03	1	04
3033	31	EOT

Updatable Text Field Length:	Set to 0004.
Delimiter:	Set to 2C, for comma.
Offset within external data buffer:	Set to 0000 as it is not used in this example.
Index:	Set to 03.
Comms Method:	Set to 1 for Ethernet.

Insert a Thin Space of One Stroke – '}N' $7D_h$ $4E_h$

This command inserts a one stroke wide space.

Set String Format

	ESC	Command ID
ASCII	ESC	}N
HEX	1B	7D4E

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

PART 8 : NEGATIVE ACKNOWLEDGEMENT ERROR CODES

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NEGATIVE ACKNOWLEDGEMENT ERROR CODES

Negative acknowledgement error codes consist of 3 ASCII digits which are transmitted to the controller following the negative acknowledgement control character.

ASCII	Explanation
000	Software error (this error code should never occur)
001	Specified character set not present
002	Invalid command header, <ESC> expected
003	Unrecognised command code following <ESC>
004	Unexpected characters occurred before <EOT>
005	Invalid head selector
006	Out of range print acknowledgement character
007	Command parameter out of permitted range
008	Print label number out of range
009	Syntax error
010	Print label too long for label store
011	Print label too long for print buffer
012	Invalid embedded format command
013	Invalid character in print label
014	Invalid number of lines in print label
015	Invalid character size specified in print label
016	Cannot load label
017	Specified print label number is invalid
018	Label assigned to another product detector
019	Cannot assign logo to single line head
020	Command not implemented
021	Logo ID invalid for specified character set
022	Invalid character set specified
023	Invalid checksum field
024	Checksum error
025	No character set RAM available
026	Character set download error
027	Command rejected printing disabled
028	Clock ID out of range

ASCII	Explanation
029	Invalid clock field selector
030	Duplicate clock field specified
031	Time-conditional string has duplicate time field
032	Serial number out of range
033	Serial number increment value too big
034	Identifier out of range
035	Numeric field too long
036	Non-numeric character encountered
037	Both numeric and pre/suffix lengths are zero
038	Non-alpha character encountered
039	Invalid step order selected
040	Invalid product detector identity specified
041	Too many time-conditional strings specified
042	Time-conditional string identifier out of range
043	Time-conditional string time limit out of range
044	Time-conditional string too long
045	Invalid barcode type specified
046	Command invalid in barcode string
047	Maximum character size must be selected first
048	Invalid character for barcode type
049	Invalid character count for barcode
050	The printer is busy with Auto repeat de-assert photocell
051	An internal printer error caused the command not to be processed
052	The requested file could not be found
301	There are too many MRC
401	Wrong language ID out of range
402	Ignore send acknowledge
403	MRC exceed maximal width
404	Invalid 2D code type
405	Invalid 2D code format
406	Invalid 2D code ECC

ASCII	Explanation
407	Invalid 2D code rows number
408	Invalid 2D code columns number
409	Invalid 2D code magnification factor
410	Invalid 2D code alignment

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EXTENDED CODENET COMMANDS

A previously unused command character 'O' (4FH) has been used to access the extended commands. This set of the extended commands is only available on A-Series and Ax-Series printers.

Send Data to FiFo Buffer to fill an Updatable Text Field – 'OE' $4F_h$ 45_h

For serial connections it is only possible to have one connection per port. For that reason it is not possible to use Codenet together with data streaming through the same port. To fill an updatable text field, data must be sent per print via Codenet using this command.

Use this command in conjunction with Command 4F50 (OP) which sets up the FiFo buffer parameters. The command OE allows external data to be sent to the printer, storing the external data block in the RS232 serial buffer. The command also allows the external data queues and historic log to be cleared. This command is an alternative way to send data to the FiFo buffer. The other method is to use Port 16000 to stream data to the Serial buffer.

Notes: (1) Clear the buffer before sending data to ensure nothing that was in the buffer is printed.

(2) This command only works with ASCII data. To use Unicode the data must be streamed into the printer's Ethernet Port.

Set String Format

	ESC	Command ID	Data Block Length	Data	EOT
ASCII	ESC	OE	0001 to 1024	Any legal character (As Data Block Length)	04
HEX	1B	4F45	30303031 to 31303234	Any legal character (As Data Block Length)	EOT

Data Block Length:	Four digits that specify the length of the data block. Range: 0001 to 1024 (30303031 to 31303234)
Data:	The data without start and end characters. The number of characters depends on the "Data Block Length" value.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Clear String Format

	ESC	Command ID	Clear Command	Data	EOT
ASCII	ESC	OE	0000	0, 1 or 2	04
HEX	1B	4F45	30303030	30, 31 or 32	EOT

Clear Command: Four digit command to clear the queue. Always 0000 (30303030)

Data: One digit that selects which queue to clear:
0 (30) = TCP
1 (31) = RS232
2 (32) = Historic Queue

Response to Clear

ACK (06) = Positive

or,

NAK (15) = Negative

Print Height – 'OH' $4F_h$ 48_h

This command allows control of the print height as a percentage.

Set String Format

	ESC	Command ID	Print Height %	EOT
ASCII	ESC	OH	055 to 100	04
HEX	1B	4F48	303535 to 313030	EOT

Print Height %: Three digits that set the print height %.
055 (303535) = 55%
060 (303630) = 60%
065 (303635) = 65%
070 (303730) = 70%
075 (303735) = 75%
080 (303830) = 80%
085 (303835) = 85%
090 (303930) = 90%
095 (303935) = 95%
100 (313030) = 100%

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	OH	?	04
HEX	1B	4F48	3F	EOT

Response to Query

Same as set string format with current values.

Store Bitmap – 'OL' $4F_h$ $4C_h$

This command stores a Windows compatible black and white bitmap (not grey scale) in the logo store on the printer. The bitmap can be inserted into a label via the 6D (m) or 78 (x) commands.

Note: The Bitmap must be 2 colour black and white, and conform to the bitmap (.bmp) standard.

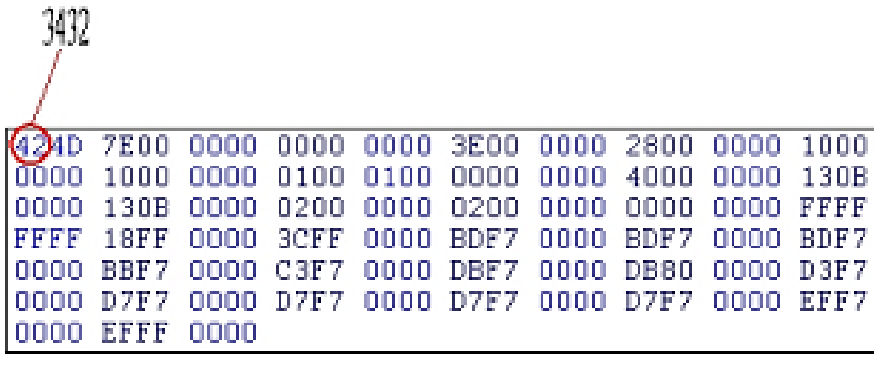
Set String Format

	ESC	Command ID	Number of Bitmap Name Characters	Bitmap Name	Bitmap Data	EOT
ASCII	ESC	OC	1 to 5	Any legal characters (As “Number of Bitmap Name Characters” value)	Values of the bitmap in hex. i.e. 0F is sent as 3046.	04
HEX	1B	4F4C	31 to 35	Any legal characters (As “Number of Bitmap Name Characters” value)	Values of the bitmap.	EOT

Number of Bitmap Name Characters:	Single digit that specifies the number of bitmap name characters. Valid digits: 1 to 5 (31 to 35)
Bitmap Name	One to five characters that specify the name of the bitmap. The number of characters depends on the “Number of Bitmap Name Characters” value. Valid characters: 1 to 9 and A to z (31 to 39 and 41 to 7A)
Bitmap Data:	The hex values of the bitmap. Excepted values are from the range 0x30 to 01x39 or 0x41 to0x46 bitmap data. Maximum number of characters that you can encode is 2048. A 219x32 bitmap is 2016 bytes.

To work out the Bitmap Data, refer to the example below which shows the hex values for each byte of a 16x16 logo named Img.bmp.

Each byte is represented by a Hex value as circled. The value circled is 42 but we need to break this down to two digits 4 and 2. Each of these digits must be sent down as a hex values, so 42 becomes 3432. When 3432 enters the printer it is stored back as 42.



The name of the logo is Img which means it is 3 characters long we end up with the following protocol string.

Example in ASCII:

ESCOL3Img343234443745303030303030303030303030303345303030303030323830303030303031303030303030303031303030303030303031303030313030303030303034303030303030303233304230303030323330423030303032303030303030303230303030303030303030303030303046464646464630303138464630303030334346463030303042444637303030304244463730303030424446373030303042424637303030304333463730303030444246373030303044423830303030304433463730303030443746373030303044374637303030304437463730303030454646373030303045464646303030300404

Example in HEX:

1B4F4C33496D673432344437453030303030303030303030303033453030303030303238303030303030313030303030303030313030303030303030313030303130303030303030343030303030303030323330423030303032333042303030303032303030303030303032303030303030303030303030303046464646464630303138464630303030334346463030303042444637303030304244463730303030424446373030303042424637303030304333463730303030444246373030303044423830303030304433463730303030443746373030303044374637303030304437463730303030454646373030303045464646303030300404

Store Labels with variable length name – 'OM' $4F_h$ $4D_h$

This command allows labels with a variable length label name to be sent to the printer's label store and stored with that name. The command also allows the label to be queried.

Set String Format

	ESC	Command ID	Length of Label Name	Label Name	Label Data	EOT
ASCII	ESC	OM	01 to 50	Any legal characters (As "Length of Label Name" value).	Any legal characters	04
HEX	1B	4F4D	3031 to 3530	Any legal characters (As "Length of Label Name" value).	Any legal characters	EOT

Length of Label Name:	Two digits that specify the number of label name characters. Valid digits: 01 to 50 (3031 to 3530)
Label Name	Characters that specify the name of the label. The number of characters depends on the "Length of Label Name" value. Valid characters: 1 to 9 and A to z (31 to 39 and 41 to 7A)
Label Data:	Label data characters. Valid characters: 1 to 9 and A to z (31 to 39 and 41 to 7A)

Set String Example

	ESC	Command ID	Length of Label Name		Label Name					Label Data				EOT
ASCII	ESC	OM	0	5	B	E	A	N	S	A	B	C	D	EOT
HEX	1B	4F4D	30	35	42	45	41	4E	53	41	42	43	44	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Length of Label Name	Label Name	Query Command	EOT
ASCII	ESC	OM	01 to 50	Any legal characters (As “Length of Label Name” value).	?	04
HEX	1B	4F4D	3031 to 3530	Any legal characters (As “Length of Label Name” value).	3F	EOT

Length of Label Name:	Two digits that specify the number of label name characters. Valid digits: 01 to 50 (3031 to 3530)
Label Name	Characters that specify the name of the label. The number of characters depends on the “Length of Label Name” value. Valid characters: 1 to 9 and A to z (31 to 39 and 41 to 7A)

Response to Query

Same as set string format with current values.

Retrieve a Label with a Variable Length Name from the Label Store and put Online – 'ON' $4F_h$ $4E_h$

This command is used to get a label with a variable length name and put it on-line for printing.

Set String Format

	ESC	Command ID	Head Select	Length of Label Name	Label Name	EOT
ASCII	ESC	ON	1	01 to 50	Any legal characters (As “Length of Label Name” value).	04
HEX	1B	4F4E	31	3031 to 3530	Any legal characters (As “Length of Label Name” value).	EOT

Head Select:	1 digit print head selection. This is always 1 (31) for an Ax-Series printer.
Length of Label Name:	Two digits that specify the number of label name characters. Valid digits: 01 to 50 (3031 to 3530)
Label Name	Characters that specify the name of the label. The number of characters depends on the “Length of Label Name” value. Valid characters: 1 to 9 and A to z (31 to 39 and 41 to 7A)

Set String Example

	ESC	Command ID	Head Select	Length of Label Name		Label Name					EOT
ASCII	ESC	ON	1	0	5	B	E	A	N	S	EOT
HEX	1B	4F4E	31	30	35	42	45	41	4E	53	04

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Head Select	Query Command	EOT
ASCII	ESC	ON	1	?	04
HEX	1B	4F4E	31	3F	EOT

Response to Query

Same as set string format with current values.

Configure FiFo Buffer to Receive External Data – 'OP' $4F_h$ 50_h

The following extended command can be used to configure the FiFo Buffer on the printer.

Set String Format

	ESC	Command ID	Start Character	External Data Encoding	End Character
ASCII	ESC	OP	02 or FF	0 or 1	03 or FF
HEX	1B	4F50	3032 or 4646	30 or 31	3033 or 4646

Length of External Data Block	ACK/NAK Setup	Historic Log Setup	Duplicate Packet Setup
0001 to 1024	0 or 1	0 or 1	00 to 10
30303031 to 31303234	30 or 31	30 or 31	3030 to 3130

Action for Historic Log Full	Historic Log Persistence	Action for Data when Label is Changed	EOT
0 or 1	0 or 1	0 or 1	04
30 or 31	30 or 31	30 or 31	EOT

Start Character: Two digit start character.
02 (3032) = STX
FF (4646) = No start character

External Data Encoding: One digit character.
0 (30) = ASCII
1 (31) = Unicode

End Character: Two digit end character.
02 (3032) = ETX
FF (4646) = No end character

Length of External Data Block: Four characters used to define the length of the external data block if no start and end characters are defined. Maximum length is 1042 bytes.
Valid characters: 0001 to 1042 (30303031 to 31303432)

ACK/NAK Setup: One digit character to enable or disable positive/negative acknowledgement given when data is recevied. Some external devices do not like anything returned from the printer.
0 (30) = Disable ACK/NAK
1 (31) = Enable ACK/NAK

Historic Log Setup:	One digit character to enable or disable writing of packet data to the historic log. The historic log can hold up to 1000 entries. 0 (30) = Do not write each packet of data to the historic log. 1 (31) = Write each packet of data to the historic log.
Duplicate Packet Setup:	Two digits that define the number of duplicate packets allowed before an alert is set. Each packet is checked against the entries in the historic log. 00 (3030) = Any duplicates in the last 1000 packets will raise an alert. 10 (3130) = 10 duplicates can occur before an alert is raised.
Action for historic log full	One digit that defines what action occurs when the historic log is full (1000 entries). 0 (30) = Overwrite entries in the historic log after 1000 entries. 1 (31) = Clear historic log after 1000 entries and start again.
Historic Log Persistence:	One digit that defines what happens to the historic log when the printer is shut down. 0 (30) = Clear historic log on printer shut down. 1 (31) = Save historic log on printer shut down.
Action for Data when Label is Changed:	One digit that defines what action occurs when the label is changed. 0 (30) = Keep data in the external data queue when the label changes. 1 (31) = Clear data in the external data queue when the label changes.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	OP	?	04
HEX	1B	4F50	3F	EOT

Response to Query

Same as set string format with current values.

Download Label without Save – 'OQ' $4F_h$ 51_h

This command will allow labels to be downloaded directly to the SGB. A Three digit number is required for the SGB to reference this label however it is *not* stored in the label store.

Set String Format

	ESC	Command ID	Label Slot Number	Label Data	EOT
ASCII	ESC	OQ	001 to 255	Any legal characters.	04
HEX	1B	4F51	303031 to 323535	Any legal characters.	EOT

Label Slot Number: Three digit label reference number. Normally set to 001 (303031) only, but can be set between 001 and 255 (303031 and 323535).

Label Data: Label data characters.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

Note: The label slot number is always set to 000 (303030) as this is the currently printing label. A query to anything other than a label with slot number 000 will bring back the contents from that label in the label store.

	ESC	Command ID	Label Slot Number	Command ID	EOT
ASCII	ESC	OQ	000	?	04
HEX	1B	4F51	303030	3F	EOT

Response to Query

Same as set string format with current values.

Sequence Ink Jet on and off – 'OS' $4F_h$ 53_h

This command allows the user to remotely sequence the printer's ink jet on and off. This does not switch the printer on or off. If the printer is off, i.e. no electric power supplied to it, then this command, like any other, will not work.

Set String Format

	ESC	Command ID	State	EOT
ASCII	ESC	OS	0 or 1	04
HEX	1B	4F53	3 or 1	EOT

State: One digit to sequence the ink jet on or off.
0 (30) = Sequence ink jet off (Standby)
1 (31) = Sequence ink jet on (Ready to print)

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	OS	?	04
HEX	1B	4F53	3F	EOT

Response to Query

	ESC	Command ID	State	Jet Status	EOT
ASCII	ESC	OS	0 or 1	D007 to DB07	04
HEX	1B	4F53	3 or 1	D007 to DB07	EOT

State: One digit to sequence the ink jet on or off.
0 (30) = Sequence ink jet off (Standby)
1 (31) = Sequence ink jet on (Ready to print)

Jet Status: Two hex characters that show the ink jet status.
D007 = Beginning
D107 = No Status
D207 = Printing Disabled
D307 = Ready to Print
D407 = Sequencing On
D507 = Sequencing Off
D607 = Heating
D707 = Head Flushed
D807 = Jet Running
D907 = Modulating
DA07 = Phase Locked
DB07 = Ink On but Jet Off
DC07 = Jet On But Modulation Off
DD07 = Jet On But HV Off
DE07 = Jet On but Modulation Off
DF07 = Bleeding Head
E007 = Wakeup Cycle On
E107 = Standby
E207 = Manual
E307 = Fault
E407 = Recovering
E507 = Wakeup Cycle Off
E607 = Off
E707 = Initialising
E807 = Booted
E907 = Not Detected
EA07 = Undefined
EB07 = Fault Recovery
EC07 = Null State
ED07 = END

External Data Queue Expired Entries Config – 'OV' $4F_h$ 56_h

This command specifies the printer's behaviour when the external data queue expires.

Set String Format

	ESC	Command ID	Transport Stream	Expired Entry State	Expiry Time
ASCII	ESC	OV	1 or 0	1 or 0	0000 to 2359
HEX	1B	4F56	31 or 30	31 or 30	30303030 to 32333539

Store Expired Entry ID State	ID Length	EOT
1 or 0	00 to 99	04
31 or 30	3030 to 99	EOT

Transport Stream:	One digit that specifies the transport stream. 1 (31) = Ethernet 0 (30) = RS232
Expired Entry State:	One digit that specifies the expired entry state. 1 (31) = True 0 (30) = False
Expiry Time:	Four characters that specifies the expiry time. Valid Characters: 0000 to 2359 (30303030 to 32333539)
Store Expired Entry ID State:	1 digit to specifies the expired entry ID state. 1 (31) = True 0 (30) = False
ID Length:	Two digits that specify the data ID length.

Response to Set

ACK (06) = Positive

or,

NAK (15) = Negative

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	OP	?	04
HEX	1B	4F50	3F	EOT

Response to Query

Same as set string format with current values.

Get Current Status – 'O1' $4F_h$ 31_h

This command is used to query the status of the printer and the condition of the printer cabinet LEDs.

Query String Format

	ESC	Command ID	Query Command	EOT
ASCII	ESC	O1	?	04
HEX	1B	4F31	3F	EOT

Response to Query

	ESC	Command ID	Status Value	State of LEDs	EOT
ASCII	ESC	O1	000 to 255	00 to 40	04
HEX	1B	4F31	303030 to 323535	3030 to 3430	EOT

Status Value: Three digits that identify the printer's status.
See "Alert Status Table" on page 9-20.
Range: 000 to 255 (303030 to 323535)

State of LEDs: Two digits that identify the state of the LEDs.
00 (3030) = Green (ink jet on/off) ON
02 (3032) = Amber On
04 (3034) = Red ON
08 (3038) = Not Used
10 (3130) = Green (ink jet on/off) Flashing
20 (3230) = Amber Flashing
40 (3430) = Red Flashing
80 (3830) = Not Used

Alert Status Table

ASCII	HEX	Alert Name
000	303030	ALERT_NO_ALERT
001	303031	STATUS_READY
002	303032	STATUS_SEQUENCING_ON
003	303033	STATUS_SEQUENCING_OFF
004	303034	STATUS_INK_ON_JET_OFF
005	303035	STATUS_JET_ON_MOD_OFF
006	303036	STATUS_JET_ON_HV_OFF
007	303037	STATUS_BLEEDING_HEAD
008	303038	STATUS_JET_ON_MODN_RST
009	303039	STATUS_STANDBY
010	303130	STATUS_MANUAL
011	303131	STATUS_FAULT
012	303132	STATUS_INITIALISING
013	303133	STATUS_UNDEFINED
014	303134	ALERT_NULL_STATE
015	303135	ALERT_CAB_OVERHEATED
016	303136	ALERT_VENTILATION_STOPPED
017	303137	ALERT_PE_CFG_ERROR
018	303138	ALERT_MC_MODULATION_FAILED
019	303139	ALERT_MC_LOW_BREAK_OFF
020	303230	ALERT_MC_HIGH_BREAK_OFF
021	303231	ALERT_DCM_LATE_STROKES
022	303232	ALERT_DCM_SPEED_LIMIT
023	303233	ALERT_PC_CHRG_DET_FAILED
024	303234	ALERT_PC_CHRG_DET_FAILED
025	303235	
026	303236	ALERT_PC_LATE_PHASING
027	303237	ALERT_PC_PRINT_NOT_DETECTED
028	303238	ALERT_HVC_HV_TRIPPED
029	303239	
030	303330	

ASCII	HEX	Alert Name
031	303331	
032	303332	ALERT_VISCOSITY_OUT_OF_RANGE
033	303333	ALERT_VISCOMETER_FAULT
034	303334	ALERT_FLUSH_LOW
035	303335	
036	303336	ALERT_INK_LOW
037	303337	ALERT_SUMP_EMPTY
038	303338	ALERT_SUMP_WARNING1
039	303339	ALERT_SUMP_WARNING2
040	303430	ALERT_SUMP_EXPIRED
041	303431	ALERT_GUTTER_DRY
042	303432	ALERT_MAKEUP_LOW
043	303433	ALERT_GUNBODY_TEMP_HIGH
044	303434	ALERT_GUNBODY_TEMP_LOW
045	303435	ALERT_INVALID_RASTER_FILE
046	303436	ALERT_INVALID_FONT_FILE
047	303437	ALERT_NO_UPDATE_LABEL
048	303438	ALERT_NO_SELECT_LABEL
049	303439	ALERT_NO_CLR_QUEUE_LABEL
050	303530	ALERT_DATA_LATE
051	303531	ALERT_NO_DATA
052	303532	ALERT_PREMATURE_LABEL
053	303533	ALERT_LABEL_ERROR
054	303534	ALERT_LABEL_TO_CODENET
055	303535	
056	303536	
057	303537	ALERT_PREMATURE_END
058	303538	ALERT_SGB_RUNNING
059	303539	ALERT_QUEUE_FULL
060	303830	
061	303631	
062	303632	

ASCII	HEX	Alert Name
063	303633	STATUS_HEAD_FLUSHED
064	303634	STATUS_JET_RUNNING
065	303635	STATUS_PHASE_LOCKED
066	303636	STATUS_MODULATING
067	303637	ALERT_INK_HIGH
068	303638	
069	303639	STATUS_HEATING
070	303730	ALERT_HEATING_TIMED_OUT
071	303731	STATUS_RECOVERING
072	303732	STATUS_OFF
073	303733	STATUS_PRINTING_DISABLED
074	303734	ALERT_PE_STANDBY_EXPIRED
075	303735	ALERT_PE_INK_LIFE_ALTERED
076	303736	ALERT_WATCHDOG_RESET
077	303737	ALERT_MAKEUP_HIGH
078	303738	ALERT_PRESSURE_HIGH
079	303739	ALERT_PRESSURE_LOW
080	303830	ALERT_PRESSURE_OOR
081	303831	ALERT_VACUUM_OOR
082	303832	ALERT_PROG_DROPCTRL_FLASH
083	303833	
084	303834	
085	303835	
086	303836	ALERT_MC_MODN_FALL_BACK
087	303837	ALERT_MAKEUP_EMPTY
088	303838	ALERT_SUMP_WARNING1
089	303839	ALERT_SUMP_WARNING2
090	303930	ALERT_SUMP_REMIND_EXPIRY
091	303931	
092	303932	ALERT_RESVR_CHANGE_OK
093	303933	ALERT_EXPIRED_INK
094	303934	ALERT_UNKNOWN_INK

ASCII	HEX	Alert Name
095	303935	ALERT_ALREADY_USED
096	303936	ALERT_INK_LIFE_CHANGE
097	303937	ALERT_WRONG_INK
098	303938	Was ALERT_PCB_BATTERY_LOW
099	303939	ALERT_PEC_CFG_CHG
100	313030	ALERT_PEC_BLD_CHG
101	313031	ALERT_PUMPSPEED_OUT_OF_BAND
102	313032	ALERT_PUMPSPEED_HIGH
103	313033	ALERT_PUMPSPEED_LOW
104	313034	ALERT_INK_TEMP_LOW
105	313035	ALERT_INK_TEMP_HIGH
106	313036	ALERT_ADC_FAIL_PRESS
107	313037	ALERT_ADC_FAIL_SOL_LVL
108	313038	ALERT_ADC_FAIL_INK_LVL
109	313039	ALERT_ADC_FAIL_INK_TMP
110	313130	ALERT_ADC_FAIL_HD_TMP
111	313131	ALERT_ADC_FAIL_CAB_TMP
112	313132	ALERT_DATA_ERROR
113	313133	STATUS_WAKEUP_ON
114	313134	STATUS_WAKEUP_OFF
115	313135	ALERT_BLEEDING_DAMPER

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