Jaime 1000 range

RS232 Link
Parallel Link

A13862

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Edition Anglaise

Contents

A13862 Version E

PRELIMINARY INSTRUCTIONS

Read all these instructions

- FIRE:

  CAUTION:
  Consult the safety data sheet for the ink to determine whether your printer uses INFLAMMABLE inks and additives.

  If this is the case:
  - Place a foam, CO_2 or powder extinguisher close to the printer (maximum 10 metres).
  - The printer must be kept in a well aired place away from sources of heat, flames or sparks.
  - Never leave ink, additive or cleaning solution cans or cloths soaked in ink near the printer.
  - Never smoke near the printer. Display a notice with "NO SMOKING, INFLAMMABLE INK" close to the printer.
  - Make sure to keep the printer very clean, as a dry ink deposit is highly inflammable.
  - The ink, additive and cleaning solution cans must be closed and stored in a well aired room.

- ELECTRICAL CONNECTION:

  - The connection to the single phase electricity supply network must use a standard 3 pin plug with earth ; this plug must be easy to access.
  - The earth connection must comply with applicable regulations.

- HEALTH:

  - It is strictly forbidden to wear contact lenses when handling consumable products.
  - It is recommended that ink-resistant gloves and safety goggles should be worm during filling and cleaning operations.

Disconnect the printer from the mains power supply before any intervention.

IMAJE cannot be in any way held responsible should the above-mentioned rules not be respected, and in general for the non-respect of elementary safety rules concerning the utilization of these machines.

All modifications without written authorization from imaje are prohibited and their possible consequences are the responsability of the person who performed them.

The same applies for any use of the printer which does not comply with the printer's specifications.

REVISION

Update to instruction manual "RS232 link - parallel link for the Jaime 1000 range"

- The revision index A0 corresponds to the first edition of this manual.
- The revision index changes with every modifications.
  The modified pages are mentioned in the following table. This one indicates all updating since the first edition.

Date of edition	Document revision index	JAIME 1000 Software index	Modified pages
July 1994	A0	D4	Initial edition
July 1995	B	D5	All
Marsh 1999	E	D7/A43	All

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GENERAL
(14 pages)

Contents

1 Introduction

The printers in the Jaime 1000 Series 4 range are equipped with an asynchronous series, half duplex, interface, for connection to a V24 mode, "Voltage levels" or "20mA loop" transmission computer.

REMINDER	**"20mA loop" transmission affords good immunity against electric and electromagnetic interference. It is therefore particularly recommended for long distance connections or in a highly parasitic area.**

ATTENTION	**A current loop adapter is required when"20 mA current loop" transmission is used on the S4 Plus printers.**

The RS232C (or V24) standard describes the signals available during a dialog between a DTE (Data Terminal Equipment) and a DCE (Data Communication Equipment).

A maximum of 7 signals only are used for connection to an IMAJE printer of the Jaime 1000, whether for "voltage level" or "loop" transmission.

NOTE	**The Jaime 1000 printers should be considered as DTE.**

ATTENTION	**Do not use the keyboard to make any changes to the printer during a V24 dialogue (risk of conflicts).** **You are also recommended to leave the S4 Plus printers in the "MAIN MENU" during a V24 dialogue.**

2 Description of the signals used

2.1 Reference (GND)

Computer and printer earth in common.

2.2 **DSR (Data Set Ready)** in voltage levels transmission or **DSR+ and DSR-** in loop transmission.

A printer input. This signal activates the V24 mode.

A symbol appears on the screen when the DSR signal is active

C on S4 or  on S4 Plus.

2.3 **DTR (Data Terminal Ready)** in voltage levels transmission

A printer output. The signal is active as soon as the printer is ready to dialog.

2.4 RTS (Request To Send)

A printer output. The signal is active at every character sequence sent by the printer.

2.5 CTS (Clear To Send)

A printer input. The signal instructs the printer to send.

2.6 **TXD (Transmit Data)** in voltage levels transmission or **TTY OUT+ and TTY OUT-** in loop transmission.

A printer output. Data transmission.

2.7 **RXD (Receive Data)** in voltage levels transmission or **TTY IN+ and TTY IN-** in loop transmission.

A printer input. Data reception.

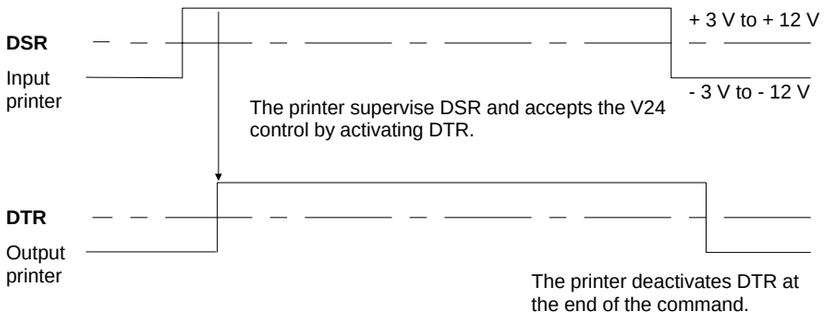
3 Electrical specifications

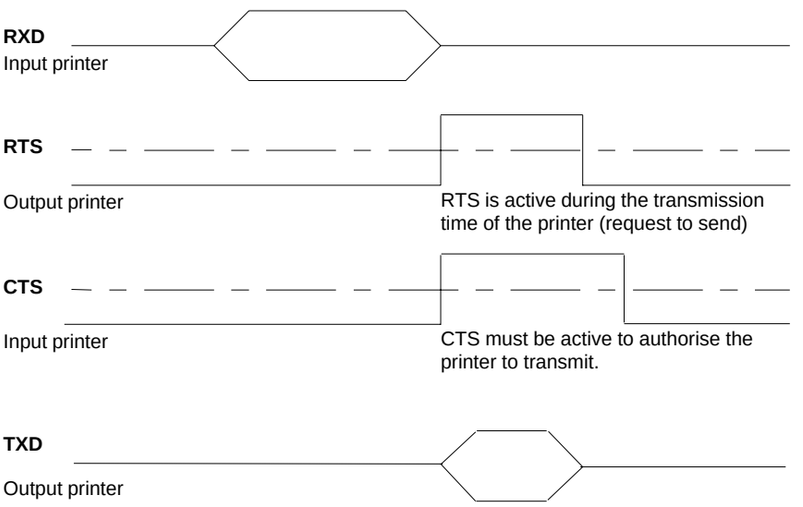
These are of V24, RS232C.

The input verification signals (DSR, CTS, RXD) are active when their voltage level is between + 3 V and + 12 V and inactive between - 3 V and - 12 V.

The output verification (DTR, RTS, TXD) are active at a voltage of 9 V and inactive at a voltage of - 9 V.

4 Timing diagram





5 Material configuration

5.1 Presentation of the terminal block of the Industrial Interface

To have access to the Industrial Interface card, unscrew the two fixing screws of its compartment housing at the rear of the printer.

Pass the connecting cable through one of the grommets and fix the wires to the corresponding terminals (see Figure 1).

NOTE **The connecting cable shield used should be connected to the periphery of the metallic stuffing box of the printer and the same type of connection should be made on the computer.**

Figure 1: Wiring of the V24 connection on B1 terminal block

1	TTYOUT-	Photocoupler output	20 mA current loop Factory set
2	TTYOUT+		
3	TTYIN-	Photocoupler input	
4	TTYIN+		
5	-TXDOT	Transmit data	RS232C link
6	RTSOUT	Request to send	
7	DTROUT	Data Terminal ready	
8	-RXDIN	Receive data	
9	CTSIN	Clear to send	
10	DSRIN	Data send ready	
11	DSR-	Photocoupler DSR input	
12	DSR+		
13	GND	0V	
14	SPROG 2		
15	COMSPROG		
16	SPROG 1		
17	COMRAZC 1		
18	RAZC1		
19	COMRAZC2		
20	RAZC2		
21	RESET-		
22	RESET+		
23	-DSR422-		
24	-DSR422+		
25	RXD422-		
26	RXD422+		
27	RXC422-		
28	RXC422+		
29	VALID422-		
30	VALID422+		
31	-DTR422-		
32	-DTR422+		
33	TXD422-		
34	TXD422+		
35	TXC422-		
36	TXC422+		
37	GND		
38	+ 5 V		
39	+ 15 V		
40	- 15 V		

5.2 Configuration of the jumpers on the Industrial Interface board

The jumpers on the Industrial Interface board allow configuration of the serial connection.

- **RXD** allows selection of the transmission mode
  - Position 232: voltage levels transmission,
  - Position 20 mA: loop transmission.

- **SW1** used only in "loop" transmission
  - Postion active: active transmission,
  - Position passsive: passive transmission.

- **SW2** used only in "loop" transmission
  - Position active: active reception,
  - Position passive: passive reception.

NOTE	**If the computer is configured in active the printer must be configured in passive on the corresponding line, and vice versa.**

- **CTS**
  - Position DSR: The printer will only transmit data if the computer gives instructions to send (DSR active) (CTS linked to DSR).
  - Position CTS: The printer will only transmit data if the computer activates the CTS.
  - Position GND: The printer can transmit continually (CTS linked to 0 V).
  - Position RTS: The printer can transmit continually (CTS linked to RTS).

Figure 1 : Location of jumpers on the Industrial Interface Card

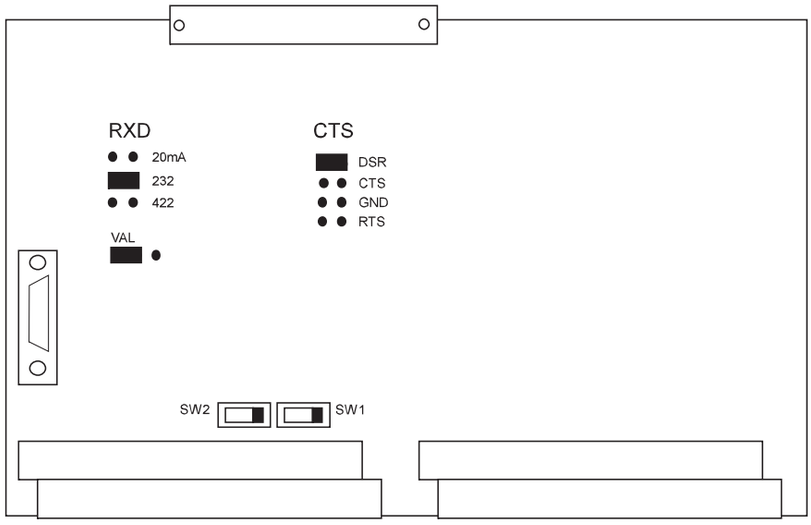


Figure 1

5.3 Presentation of the different modes

- Slave:
  In this mode the computer alone can initialize a dialog and instruct the printer to send.

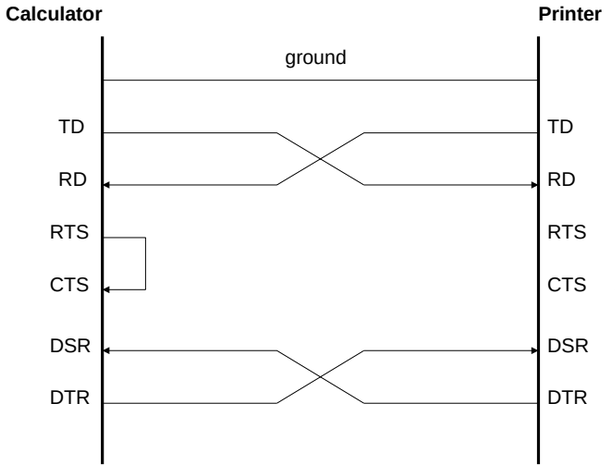
- Complete dialog:
  In this mode both the computer and printer can initialize a dialog.
  There is a check of the printer transmission.

NOTE	**The printer dialogue is not permitted until after the start-up phase. In general, control by the computer of the DTR signal from the printer ensures that the latter is ready to dialog.**

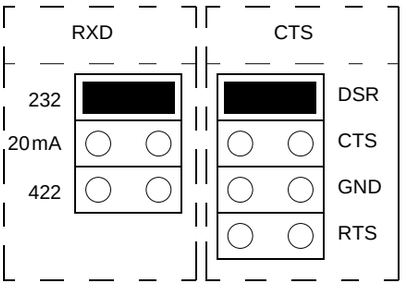
5.4 Suggested connection diagrams

5.4.1 Slave. Voltage transmission

WIRING DIAGRAM

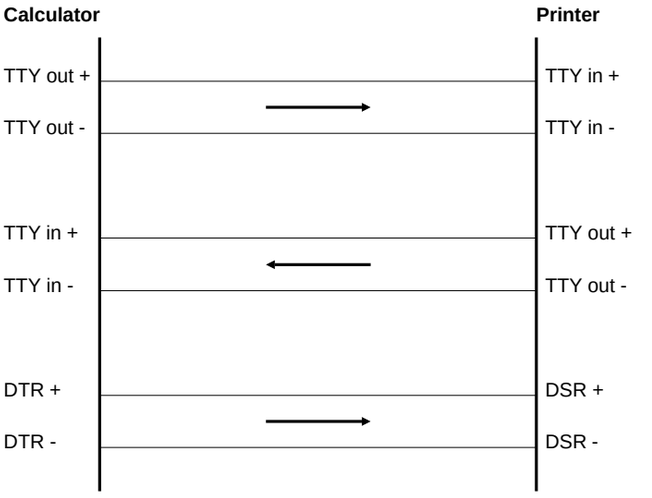


LOCATION OF JUMPERS

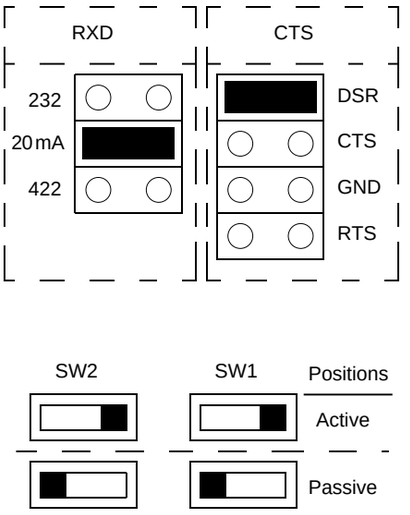


5.4.2 Slave. Loop transmission

WIRING DIAGRAM



POSITION DES CAVALIERS



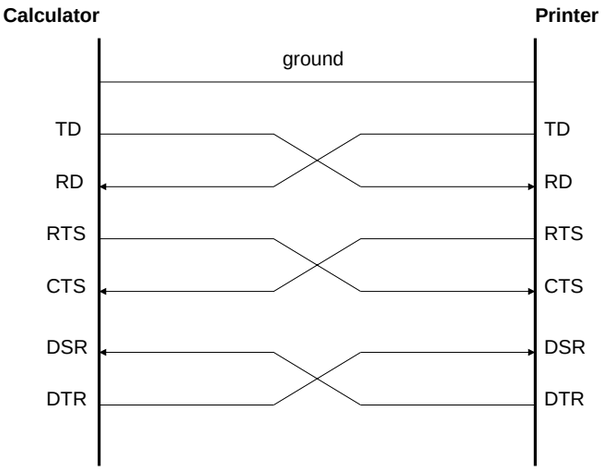
NOTE	**The time between the appearance of the DSR signal (on the printer) and the activation of the DTR may be as much as 100 ms. In slave mode it is therefore necessary to take the response time into account automatically and to allow for a minimum time of 100 ms (see timing diagram, page 2-4).**

REMINDER	**The printer dialogue is not permitted until after the start-up phase.**

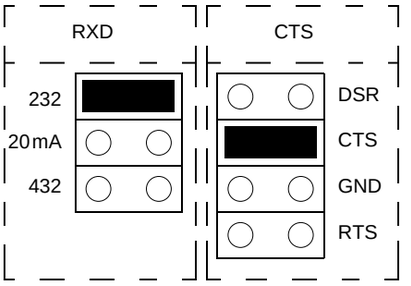
NOTE	**The value of 20 mA is preset in the factory.**

5.4.3 Complete dialogue. Transmission in voltage.

WIRING DIAGRAM



LOCATION OF JUMPERS



6 Software configuration

The transmission speed, format and value of the watchdog are programmable from the printer keyboard in:

- the SHIFT MENU function for S4 printer,
- the PRINTER PREPARATION MENU, Initialization, V24 Connection for S4 Plus printer.

6.1 Transmission speed and format on Serie 4

6.1.1 Programming

Press	Display	Remarks
SHIFT		
		For access to programmable parameters
MENU		
	V24 38400 Baud 8 Bits no Par.1 St.	
x x x		To be able to adjust the transmission speed (speed flashes)
	V 24 38400 Baud 8 Bits no Par.1 St.	
← →		To reduce or increase transmission speed
	V 24 19200 Baud 8 Bits no Par.1 St.	
1 / 2		To be able to modify the format (format flashes)
	V 24 19200 Baud 8 Bits no Par.1 St.	
← →		To modify the format
	V 24 19200 Baud 8 Bits no Par.2 St.	
SHIFT		
		For validation
MENU		
	Function ?	

6.1.2 List of speeds and formats available

- Speed (in bauds):

  600 - 1 200 - 2 400 - 3 600 - 4 800 - 7 200 - 9 600 - 14 400 - 19 200 - 38 400

- Formats:

  8 bits no Par.1 St. (8 bits without parity 1 stop)

  8 bits no Par.2 St. (8 bits without parity 2 stop)

  8 bits even Parity (8 bits with pair parity)

NOTE	**All the coded data on several bytes should be transmitted, the high-order byte first.** **All the bytes should be transmitted, the least significant bit first.**

WARNING	**In "current loop" transmission, the transmission speed is restricted to 19200 baud maximum.**

6.2 Watchdog on Serie 4

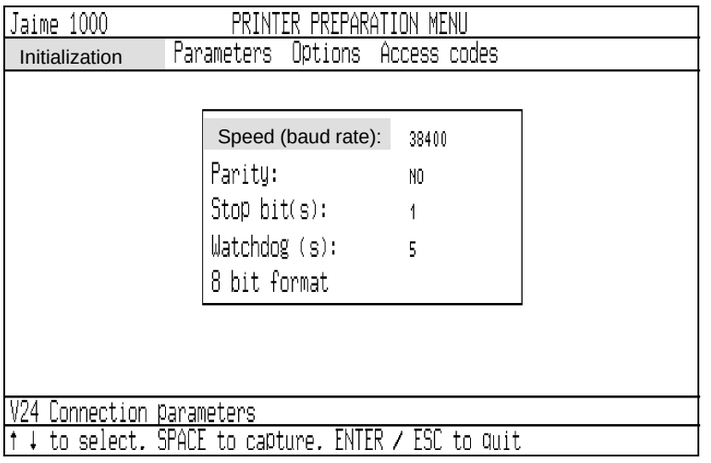
The watchdog is a value in tens of milliseconds representing a certain time above which the printer abandons a command if it has not received a complete command sequence from the calculator.

Press	Displays	Remarks
SHIFT		For access to programmable parameters.
MENU		
	V24 9600 Bauds 8 Bits no Par.1 St.	
→		For access to watchdog value.
	Watchdog V24 : 0500	
x x x		To be able to modify the value (the value can be modified using the numeric keypad from 0001 to 9999).
	Watchdog V24 : 0500	
SHIFT		
MENU		For validation.
	Function ?	

6.3 Transmission speed, format and watchdog on Serie 4 Plus

Go into the PRINTER PREPARATION menu, Initialisation, V24 connection.

The following dialogue box appears on the screen:



You can select:

- the transmission speed in baud (4800, 9600, 19200 or 38400),
- the party (none, even or odd),
- the number of stop bits (1 or 2),
- the watchdog value in seconds (from 1 to 99).

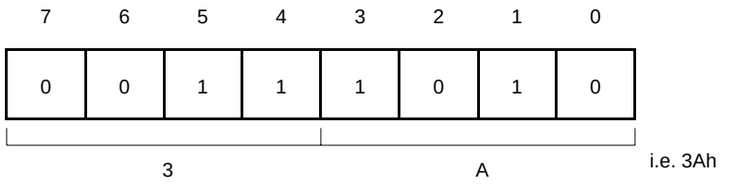
WARNING	**• The 8 bit transmission format cannot be changed.**

REMINDER	**A current loop adapter is required when"20 mA current loop" transmission is used on the S4 Plus printers.**

7 Memory aid

Conversion binary, decimal, hexadecimal.

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F



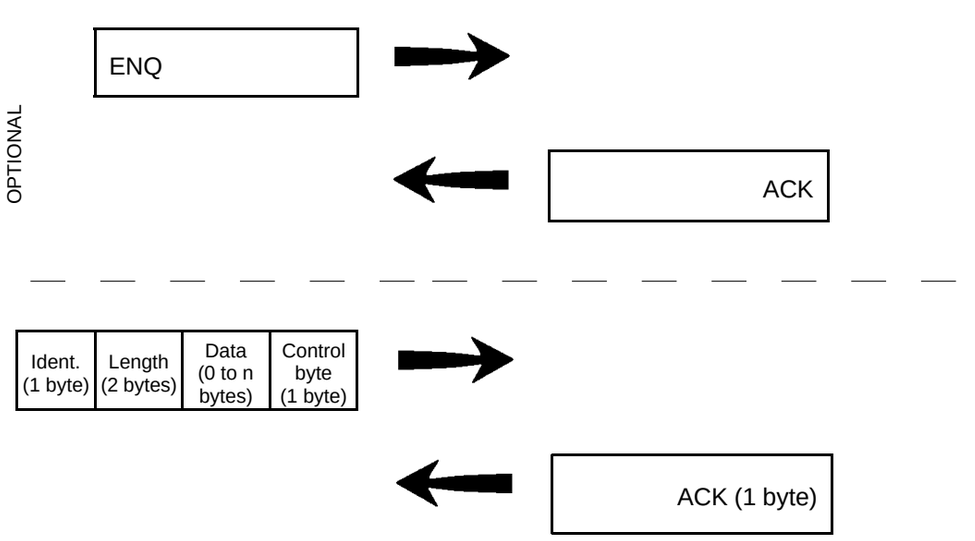
A byte (8 bits) is a suite of two hexadecimal numbers.
The "h" symbol signifies hexadecimal notation.
The ASCII norm allows the association of an alphanumerical symbol with each byte.

GENERAL PRINCIPLE OF A V24 EXCHANGE (3 pages)

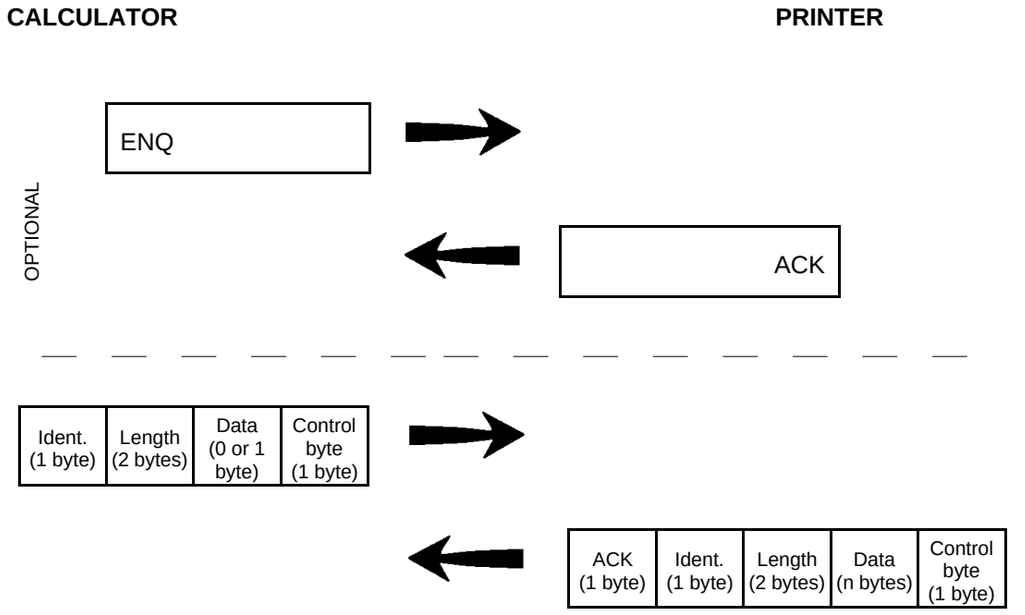
Contents

1 General principle of a V24 exchange

- Data sending from the computer to the printer



- Data request from the computer to the printer



1.1 Identification (1 byte hexadecimal)

Specific for each command (see table following pages).

1.2 Length (2 bytes in hexadecimal)

The length is the number of bytes comprised between the length and the checksum byte.

1.3 Data

Zero byte in case of request from the calculator to the printer.
1 byte precised the jet number in case of a request concerning a jet.
n bytes following one byte precising the jet number in case of a sent concerning a jet.
n bytes without precising the jet number in case of a sent concerning the printer in general.

1.4 Control byte (Checksum)

This represents an "OR" exclusive of all preceding bytes (identification, length and data bytes).

Table of the "exclusive OR" Boolean function used for the checksum

X	Y	Result
0	0	0
0	1	1
1	0	1
1	1	0

Example of checksum calculation for two bytes:

– Value: 15h in binary	00010101
– Value: 56 h in binary	01010110
Result	01000011

Or, in hexadecimal = 43 h

LIST OF THE V24 COMMANDS (4 pages)

Contents

1 Sendings

2 Requests

3 List of the V24 commands

Ident.	Title of the command	Page	§
05h	Request for V24 dialog	5-31	5.1
0Ah	Sending of a message content (printer without library)	5-18	3.3
0Bh	Sending of message parameters (printer without library)	5-17	3.2
0Ch	Sending of a complete mesage (printer without library)	5-16	3.1
0Fh	Enable/disable the keyboard with DSR active	5-6	1.5
1Ah	Sending of a message content in library	5-21	3.6
1Bh	Sending of message parameters in library	5-20	3.5
1Ch	Sending of a complete message in library	5-19	3.4
20h	Request for printer's parameters	5-33	5.3
30h	Stop/Start up printer	5-3	1.1
31h	Sending of jet status/maintenance	5-15	2.1
32h	Request for the jet status/maintenance	5-44	6.1
33h	Request for the jet and phase speed	5-45	6.2
35h	Request for the state of the ink circuit electrovalves, viscosity level and number of additives	5-34	5.4
36h	Sending of the printer initialisation	5-10	1.7
37h	Request for printer's CRC Proms	5-36	5.5
38h	Sending the parameters of a counter	5-26	4.1
39h	Request for current counters	5-49	8.1
3Ah	Resetting the counters	5-27	4.2
3Bh	Request for printer's faults	5-38	5.6
3Ch	Sending of reset faults	5-4	1.2
3Dh	Sending the shift code parameters	5-28	4.3
3Eh	Sending of keyboard code	5-4	1.3
3Fh	Sending of the security code	5-5	1.4
40h	Sending of the message number to be printed	5-24	3.8
41h	Sending the request for printing acknowledgement	5-6	1.6
42h	Sending a partial message	5-22	3.7
43h	Request for the complete current message	5-46	7.1
45h	Request of keyboard code	5-32	5.2
4Ah	Sending the contents of variable fields	5-25	3.9
4Ch	Request for shift code parameters	5-51	8.3
4Dh	Status request for S4SI	5-42	5.7
4Fh	Sending a Multitop per head and postdate 2 per jet	5-30	4.5
50h	Downloading files to the S4 Plus	5-12	1.8
94h	Command of printing	5-48	7.2
C8h	Initialisation of autoclock	5-29	4.4
D6h	Request for autoclock	5-50	8.2

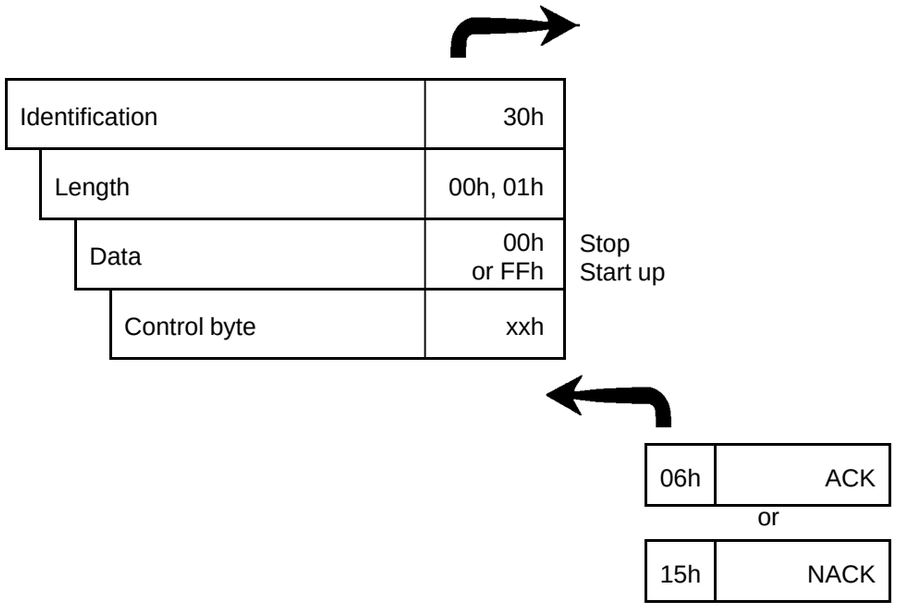
PROTOCOL
(64 pages)

Contents

1 Sendings concerning the printer

1.1 Stop/Start up printer

CALCULATOR **PRINTER**



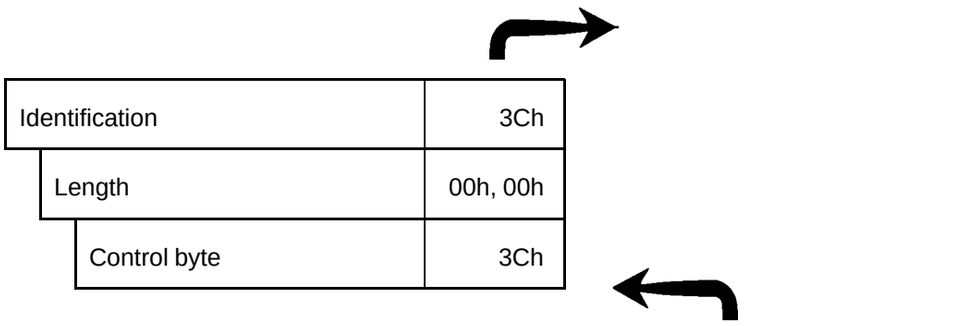
When the printer sends ACK, the jet is immediately stopped. The printer halts after 2 minutes.

WARNING **This command can only be used if the + 15 V power supply voltages are present when the printer is in standby mode (depends on the power supply model) and if DSR is active.**

The printer will start up when the DSR signal appears.

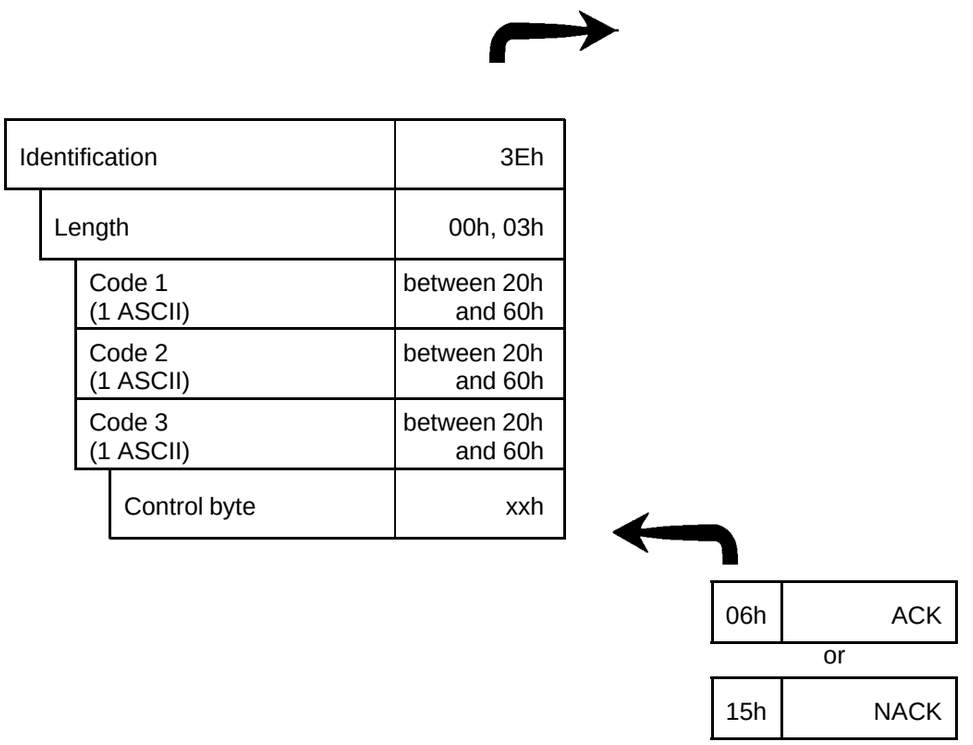
1.2 Sending of reset faults

CALCULATOR **PRINTER**



1.3 Sending of keyboard code

CALCULATOR **PRINTER**

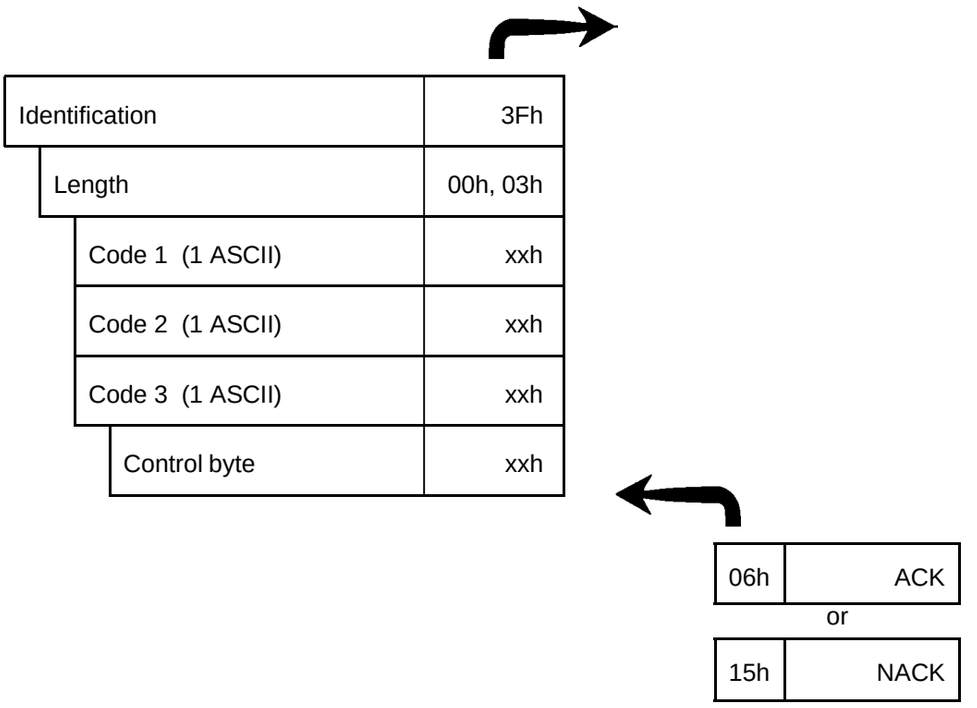


The locking code is a sequence of 3 ASCII characters (alphanumerical) comprised between 20th and 60h inclusive.
To delete to locking code, send the coded sequence:
30h/30h/30h for S4 and
20h/20h/20h for S4 Plus.

1.4 Sending of the security code

This code protects the V24 messages. It can be initialised, therefore modified but not visualised. The calculator should recognise the preceding code in order to send other sequences of instructions.

CALCULATOR **PRINTER**



The security code is a sequence of 3 ASCII characters (alphanumerical) comprised between 20h and 60h inclusive.

Transmission of NACK, SP corresponds to an incorrect security code.

NOTE	**The security code, if it was transmitted to the printer at the end of the previous utilisation, must be sent in the first sequence of each exchange.**

REMINDER	**After a reset of the memory of the CPU board, the printer automatically sets the security code to "TWO".**

1.5 Enable/disable the keyboard with DSR active

CALCULATOR → **PRINTER**

Identification	0Fh	
Length	00h, 01h	
ON/OFF keyboard	or 00h FFh	Keyboard disable (default value after reset) Keyboard enable
Control byte	xxh	

PRINTER → **CALCULATOR**

06h	ACK

or

15h	NACK

REMINDER **Do not use the keyboard to make any changes to the printer during a V24 dialogue (risk of conflicts).**
You are also recommended to leave the S4 Plus printers in the "MAIN MENU" during a V24 dialogue.

1.6 Sending the request for printing acknowledgement

CALCULATOR → **PRINT**

Identification		41h
Length		00h, 02h
Data	Jet number	xxh
	Printing acknowledgement	xxh
Control byte		xxh

PRINT → **CALCULATOR**

06h	ACK

or

15h	NACK

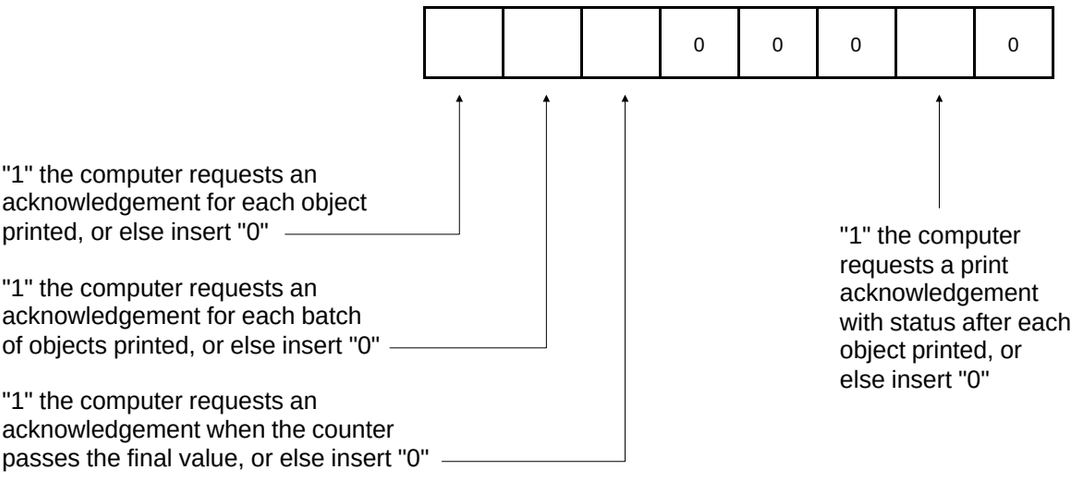
WARNING **The print acknowledgement request should be sent to all the jets of a head.**

Detail of the data bytes

- Detail of the "Jet number" byte

Printer	Head	Jet	Jet number
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

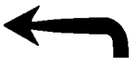
- Detail of the "Printing acknowledgement" byte.



COMMENT **Only one of these operating modes can be active at any one time.**

1.6.1 Print acknowledgement

CALCULATOR **PRINT**



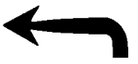
xxh	Print acknowledgement

- **Detail of the print acknowledgement**

Head 1	Head 2	
E5h	E6h	After each object
E9h	EAh	After each batch
F1h	F2h	After each final counter value
E1h	E2h	On reception of DTOP if printing is impossible (fault or jet in start-up or shutdown phase)

1.6.2 Print acknowledgement with Status after each object

CALCULATOR **PRINT**



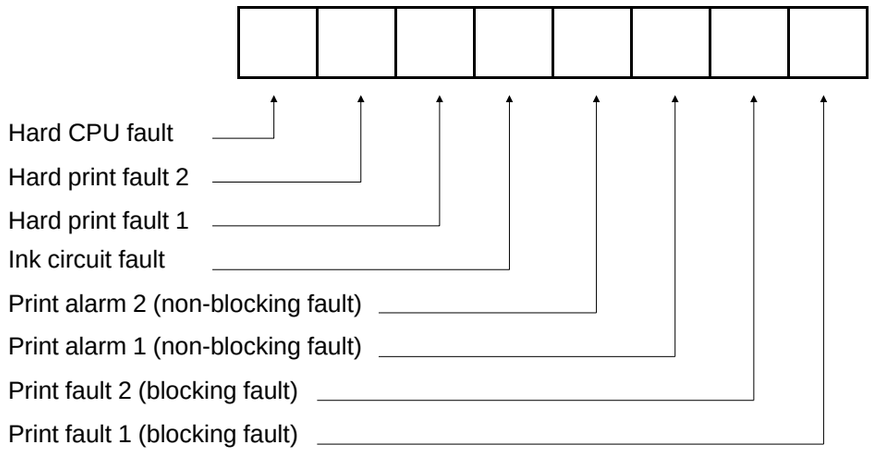
xxh	Print acknowledgement after each object	Data
xxh	General faults	
xxh xxh	Motor speed	
xxh	Pressure	
xxh	Viscosity	
xxh	Jet 1 speed	
xxh	Jet 2 speed	
xxh	Jet 3 speed	
xxh	Jet 4 speed	

Detailed description of data

- **Detail of the print acknowledgement**

Head 1	Head 2	
E5h	E6h	After each object
E1h	E2h	On reception of DTOP if printing is impossible (fault or jet in start-up or shutdown phase)

- **Detail of the "General faults" byte:**



1 = fault
0 = no fault

- **Detail of the "Motor speed" byte:**

The printer sends two hexadecimal bytes, representing the motor speed in decimal.

Calculation of the motor speed in rpm: $\frac{300\ 000}{\text{Motor speed in decimal}}$

- **Detail of the "Pressure" byte:**

The printer sends one hexadecimal byte, representing the pressure in decimal.

Calculation of the pressure in millibars: pressure in decimal x 19.6 for heads M/G.
: pressure in decimal x 39.2 for head P.

- **Detail of the "Viscosity" byte:**

The printer sends one hexadecimal byte, representing the viscometer filling time in seconds.

- **Detail of the "Jet speed" bytes:**

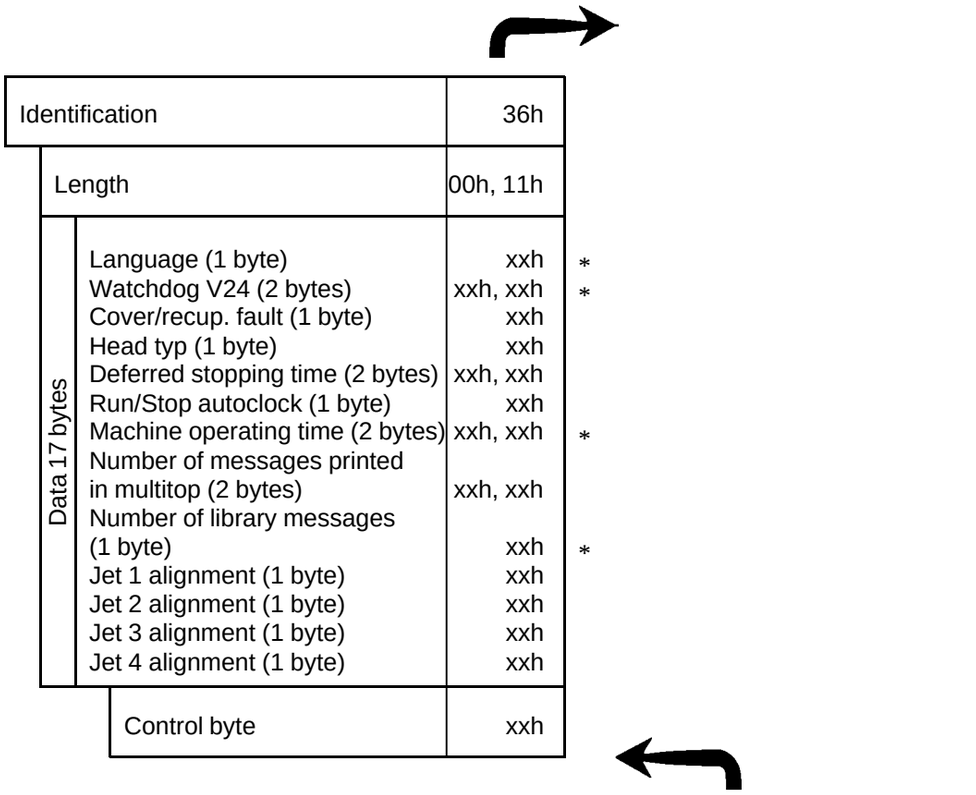
The printer sends one hexadecimal digit, representing the jet speed in decimal.

Calculation of the jet speed in m/second: $\frac{\text{Jet speed in decimal}}{10}$

1.7 Sending of the printer initialisation

ATTENTION **The bytes marked with a * are ignored by the S4 Plus printers.**

CALCULATOR **PRINTER**



Identification		36h	
Length		00h, 11h	
Data 17 bytes	Language (1 byte)	xxh	*
	Watchdog V24 (2 bytes)	xxh, xxh	*
	Cover/recup. fault (1 byte)	xxh	
	Head typ (1 byte)	xxh	
	Deferred stopping time (2 bytes)	xxh, xxh	
	Run/Stop autoclock (1 byte)	xxh	
	Machine operating time (2 bytes)	xxh, xxh	*
	Number of messages printed in multitop (2 bytes)	xxh, xxh	
	Number of library messages (1 byte)	xxh	*
	Jet 1 alignment (1 byte)	xxh	
	Jet 2 alignment (1 byte)	xxh	
	Jet 3 alignment (1 byte)	xxh	
	Jet 4 alignment (1 byte)	xxh	
Control byte		xxh	

Detail of the data bytes

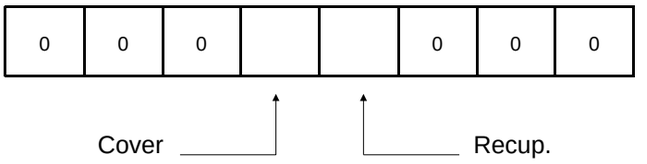
- Language:
  ** Byte ignored by S4 Plus printer.*

00h	FRENCH	06h	NORWEGIAN
01h	ENGLISH	07h	SWEDISH
02h	GERMAN	08h	DANISH
03h	ITALIAN	09h	PORTUGUESE
04h	SPANISH	0Ah	JAPANESE
05h	DUTCH		

- Watchdog V24:
  Time in tens of milliseconds, from 1 to 9999, in hexadecimal coding on 2 bytes.
  ** Bytes ignored by S4 Plus printer.*

- Cover/recup. fault byte:

State 0 = Fault active
State 1 = Fault inactive



- Head type:

00h : 1 head single jet	03h : 2 heads twinjet
01h : 2 heads single jet	04h : 1 head four jets
02h : 1 head twinjet	

- Deferred stopping time:
  Time in minutes in hexadecimal coding on 2 bytes.

- Run/Stop autoclock:
  00h = Run FFh = Stop

- Machine operating time:
  Printer operating time expressed in hours and hexadecimal coded on 2 bytes.
  ** Bytes ignored by S4 Plus printer.*

- Number of print operations in multitop mode:
  Number of messages printed following an object TOP hexadecimally coded in two bytes
  If this value is equal to 0001h (default value), it is possible to parameterise a multitop operation for each printing head using the command 4Fh.
  If a different value is entered, the multitop operation applies to all the jets of all the heads.
  In this case, the Multitop command in 4Fh is inoperative.

- Number of library messages:
  Number of possible library messages, encoded in hexadecimal in one byte.
  ** Byte ignored by S4 Plus printer.*

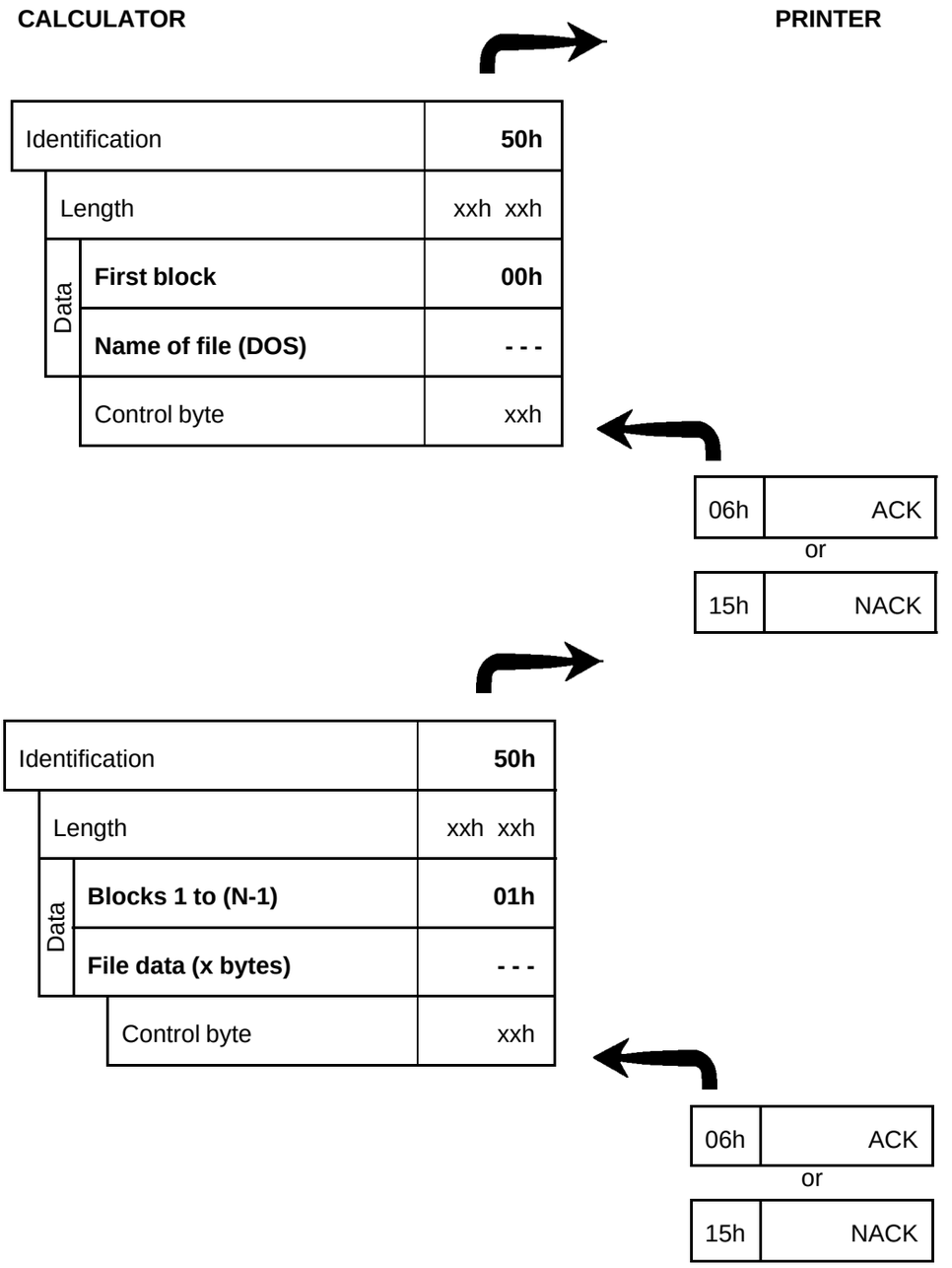
- Jet "n" alignment:
  Number of delay frames which can be allocated to a jet relative to another in order to line up their respective printing.
  This number is encoded in hexadecimal in one byte.

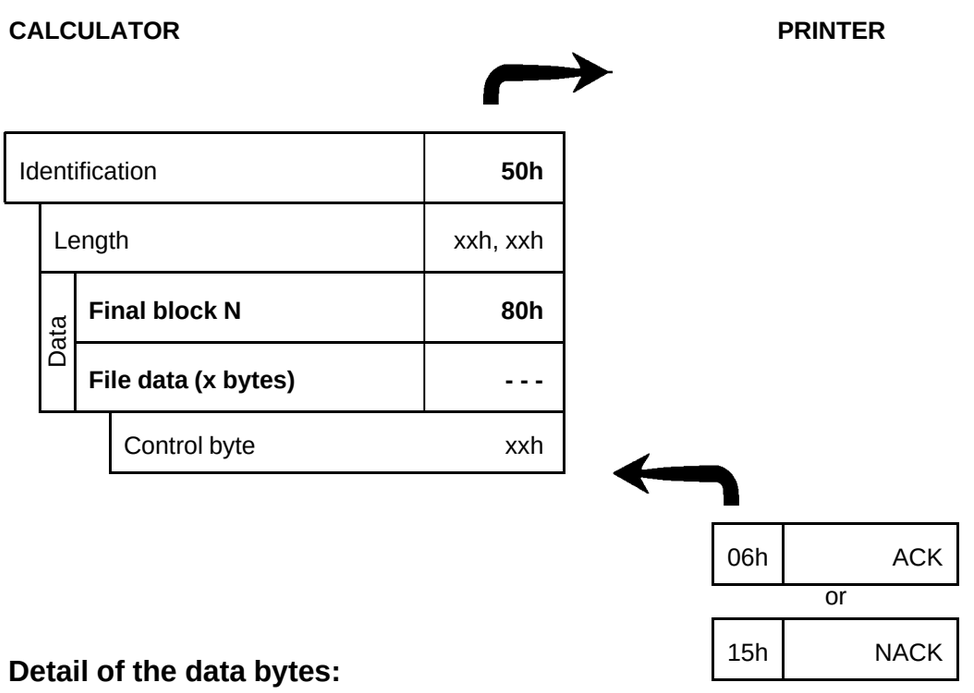
1.8 Downloading files to the S4 Plus

It is possible to download DOS files to the S4 Plus printers.

- **for editing** - load the files MASTER, IMAJE.INI, S4P.BDG, *.GCG
- **for languages** - load the files *.RC, *.IDX

The downloaded files are copied to the root of drive **D:** (backed-up RAM).
The transfer format is as follows:





Detail of the data bytes:

- "Name of file" bytes:

  Maximum of 8 characters (DOS format)

- "Length" bytes:
  The calculator sends 2 bytes in hex. format representing the length of the data (block number + file data).
  Maximum length of file data = 1KB (1024 bytes).

- "Block number" bytes:

  Transmissions must always be performed in the following order:

  00h = transmission of the DOS file name in the file data (first block).
  01h = transmission of blocks 1 to (N-1) of file data.
  80h = transmission of final block (N) of file data.

ATTENTION	**If the file already exists in the printer it will be overwritten when the first block containing the same file name is received. Downloaded files are not recognised until the printer is restarted.**

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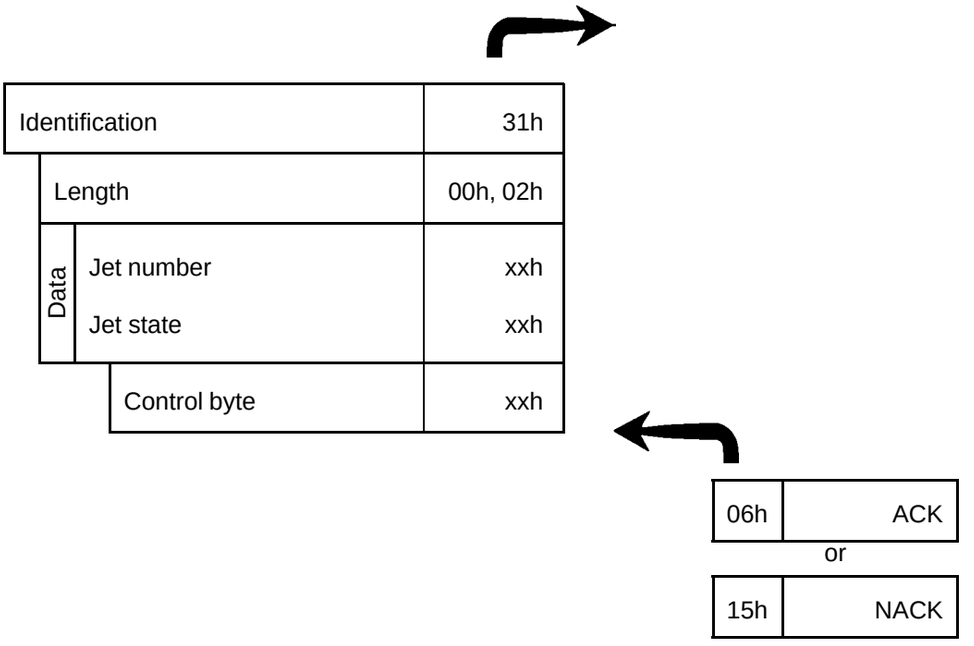
2 Sending concerning the print heads

Sending of jet status/maintenance

CALCULATOR **PRINTER**



Detail of the data bytes :

- Number of the jet:

  To command the jet(s) of head 1, send the following hexadecimal value: 01h

  To command the jet(s) of head 2, send the following hexadecimal value: 03h

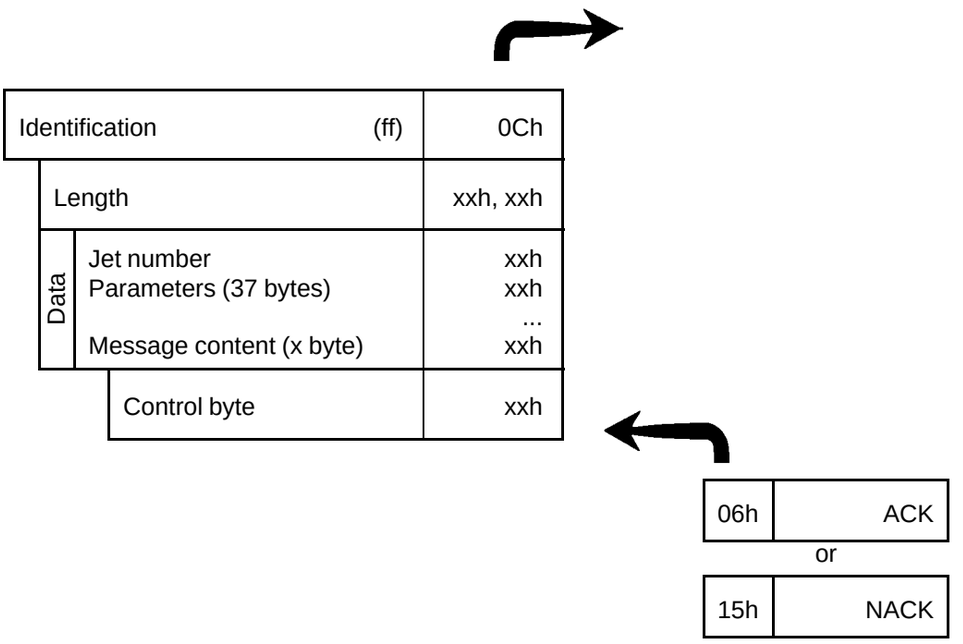
- State of the jet:

0	To stop the jet	00h
1	To start the jet	01h
2	To refresh the jet	02h
3	To stabilize the jet	03h
4	To introduce a solvent	04h
5	To unblock a nozzle	05h
6	To adjust the jet the gutter	06h

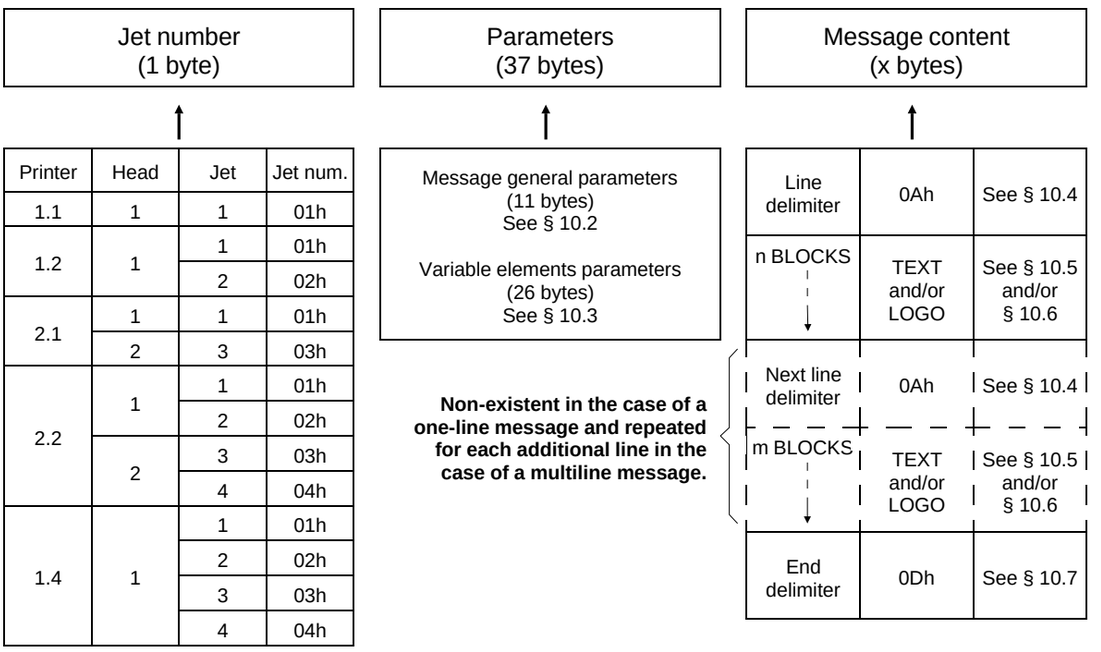
3 Sendings concerning messages

3.1 Sending a complete message (printer without library)

CALCULATOR **PRINTER**



Detail of the data bytes



Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

3.2 Sending of message parameters (printer without library)

CALCULATOR → **PRINTER**

Identification (vt)		0Bh
Length		00h, 26h
Data	Jet number	xxh
	Message general parameters	xxh
	...	...
	Variable elements parameters	xxh
Control byte		xxh

← PRINTER

06h	ACK

or

15h	NACK

Detail of the data bytes

Jet number (1 byte)	Message general parameters (11 bytes)	Variable elements parameters (26 bytes)

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

Message general parameters (11 bytes):
Message sense
Horizontal sense
Vertical sense
Tacho mode
Set off
Print speed
Forward/Return margins
Interval
Top filter

See § 10.2

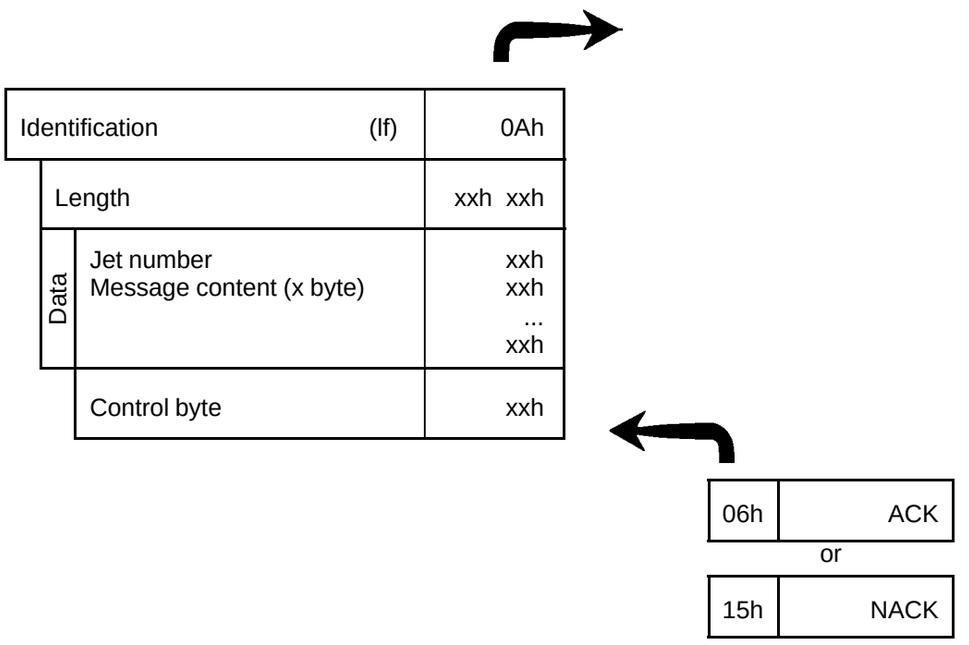
Variable elements parameters (26 bytes):
Counter:
- zeros before figure
- incrementation type
- initial value
- final value
- etc.

Autoclock:
- postdate interval

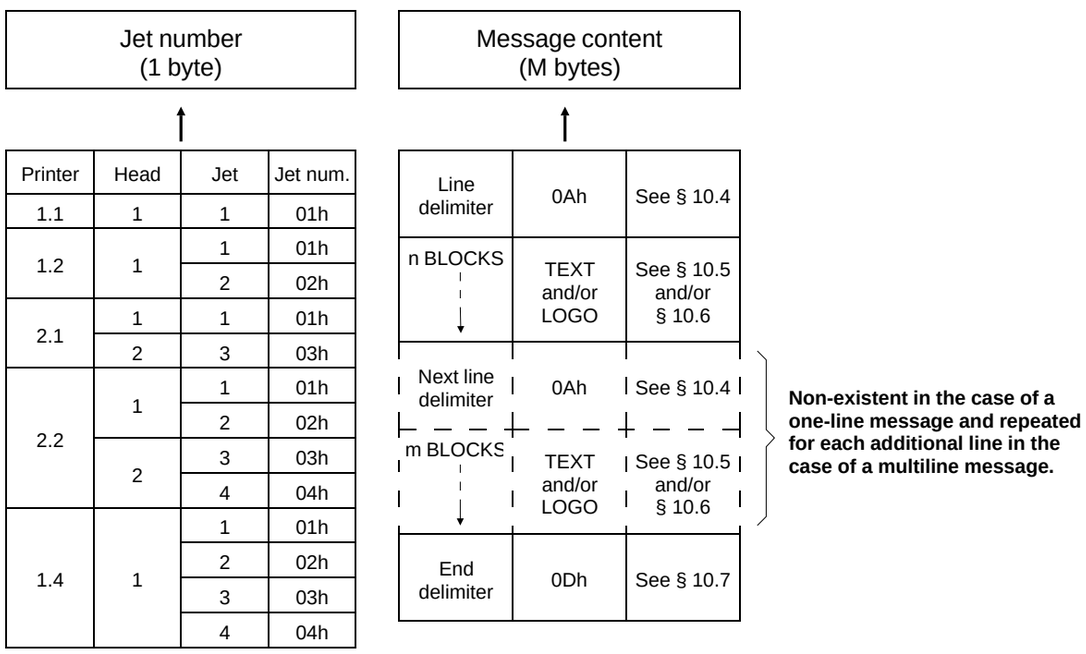
See § 10.3

3.3 Sending of a message content (printer without library)

CALCULATOR **PRINTER**



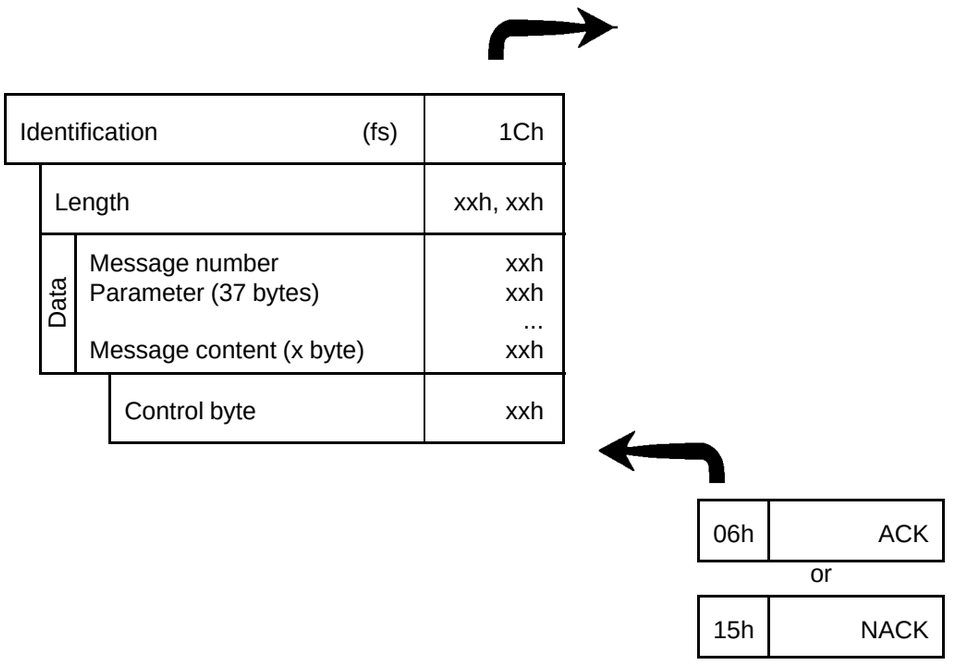
Detail of the data bytes



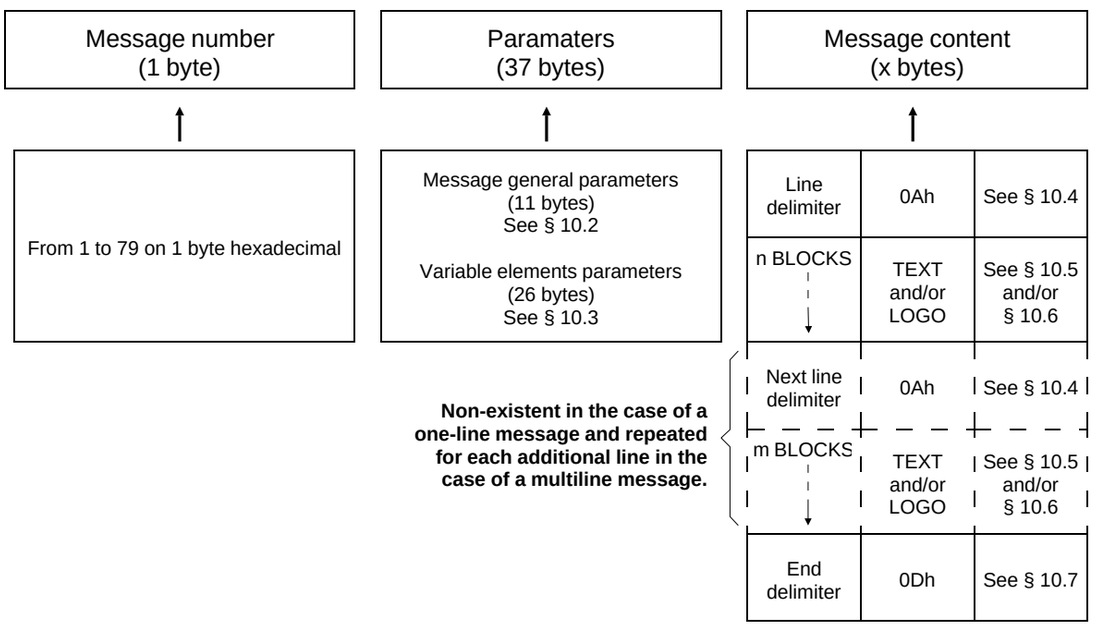
Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

3.4 Sending of a complete message in library

CALCULATOR **PRINTER**

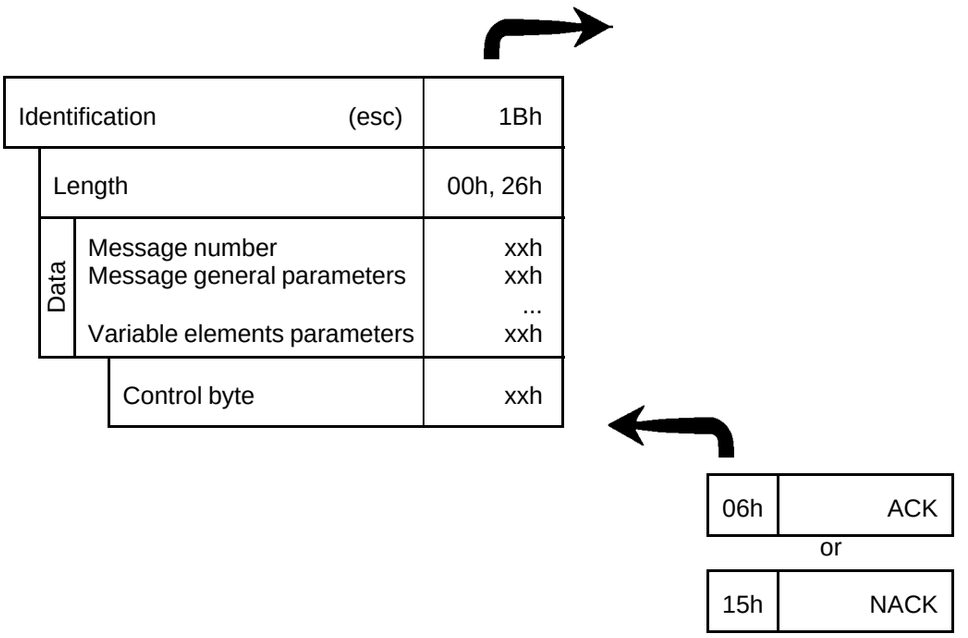


Detail of the data bytes

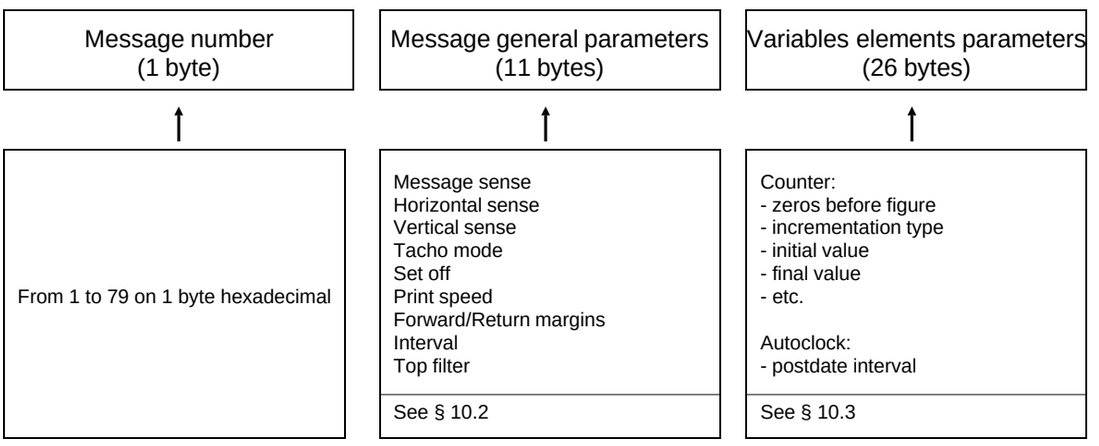


3.5 Sending of a message parameters in library

CALCULATOR **PRINTER**

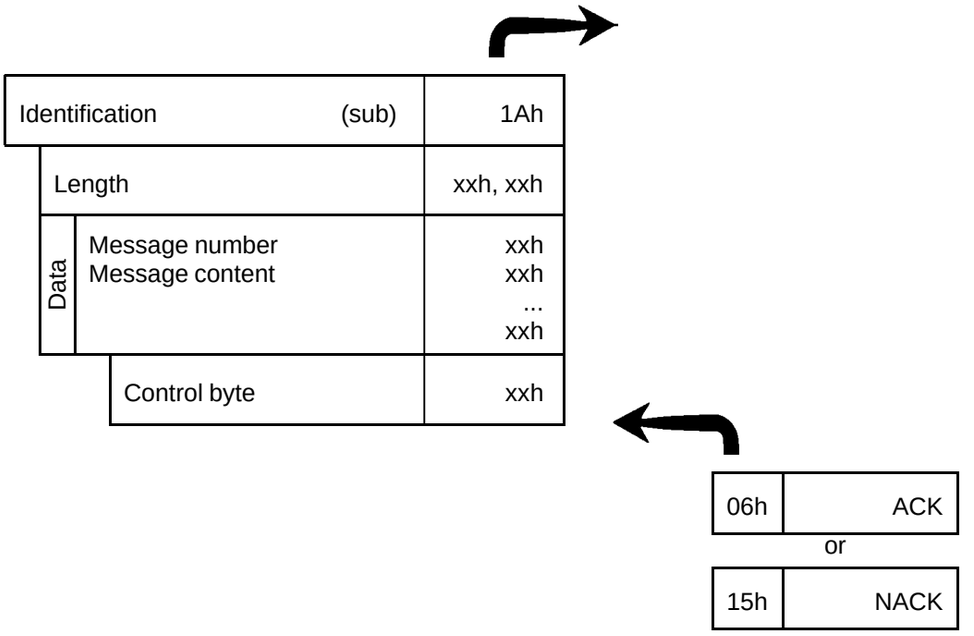


Detail of the data bytes

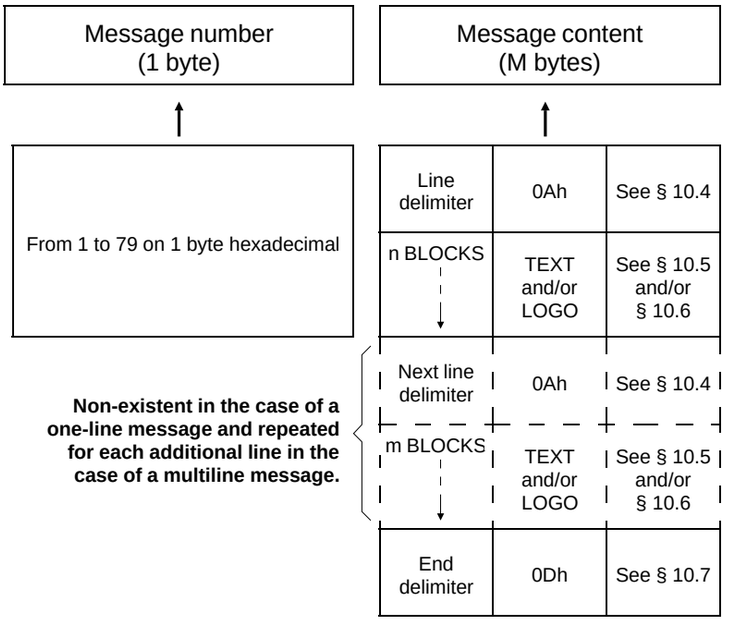


3.6 Sending of a message content in library

CALCULATOR **PRINTER**



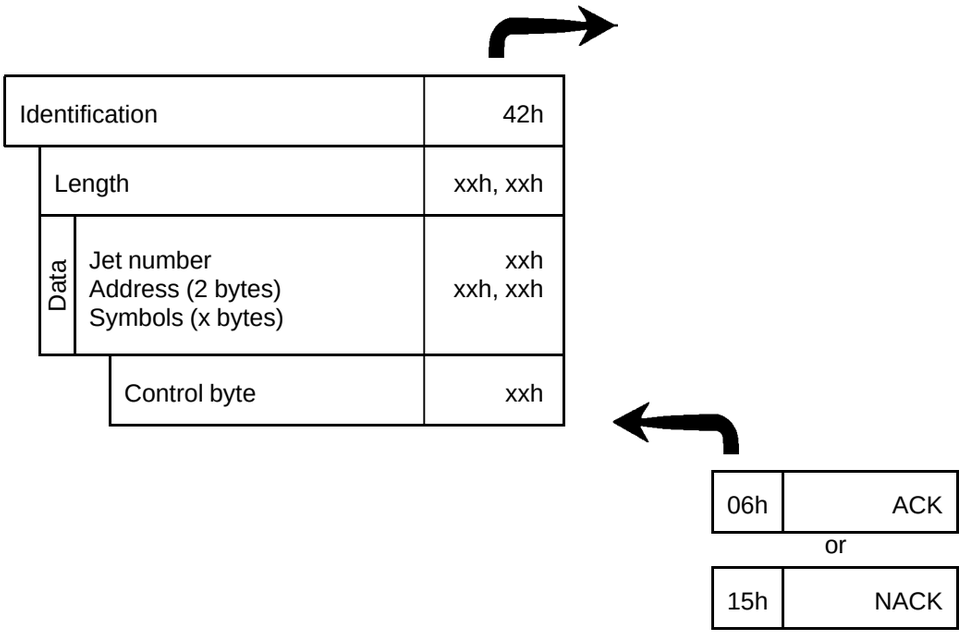
Detail of the data bytes



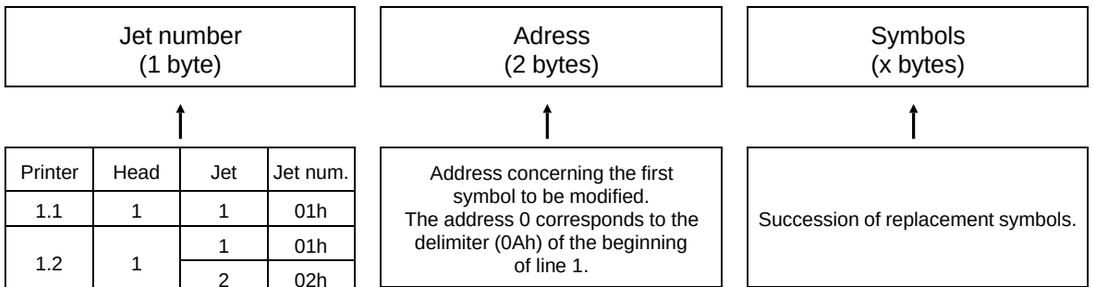
3.7 Sending a partial message

This command makes it possible to modify current messages, that is to say those selected for printing.

CALCULATOR **PRINTER**



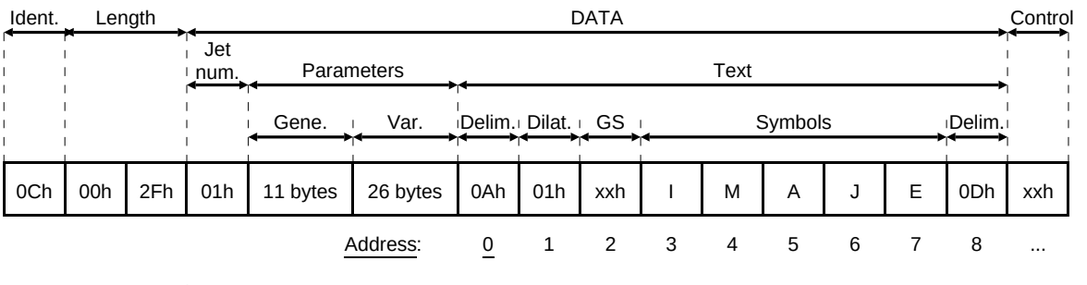
Detail of the data bytes



Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

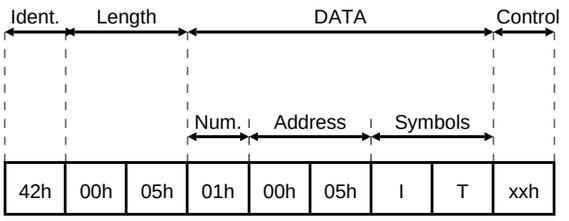
See following example.

- Sent of a complete message on the jet 1 (printer without library)



The printing is: IMAJE

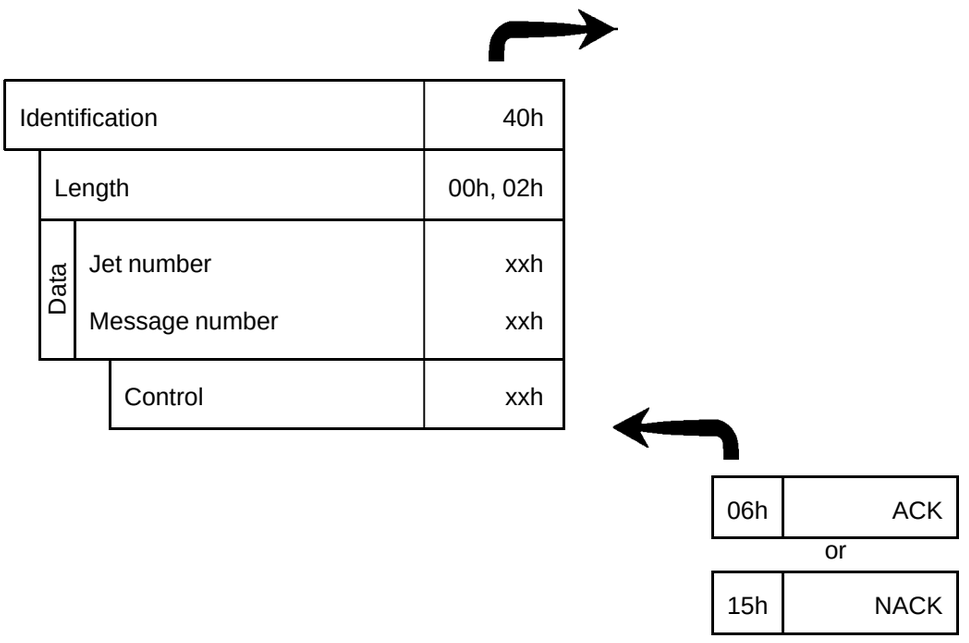
- Modification of the message by **sending a partial message**



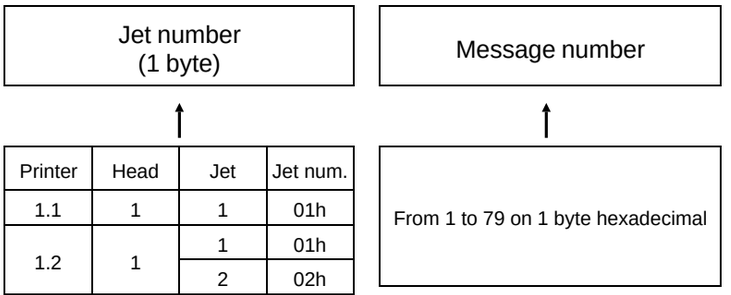
The printing is: IMITE

3.8 Sending of the message number to be printed

CALCULATOR **PRINTER**

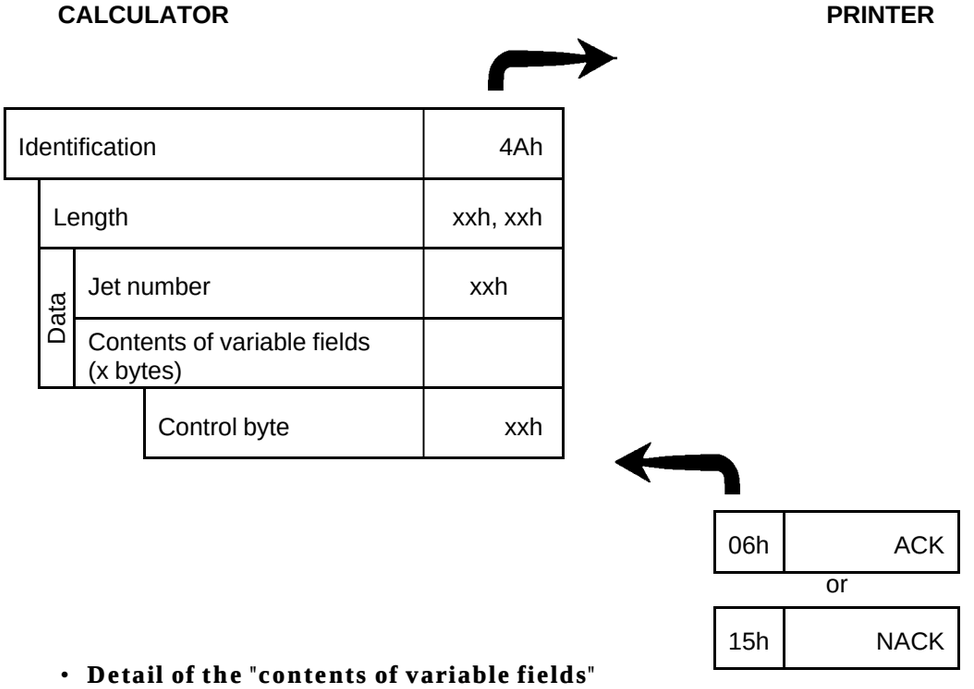


Detail of the data bytes



Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

3.9 Sending the contents of variable fields



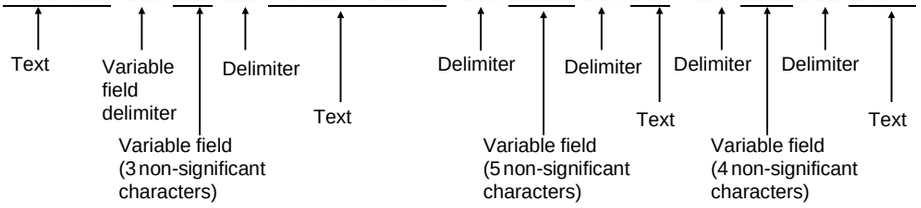
- **Detail of the "contents of variable fields"**

  This field contains a string of characters in the exact order of the variable fields in the base message. The number of characters sent must be exactly equal to the number of spaces reserved in the base message. A bar code can be contained in a variable field.

  NOTE:

  In the base message, the variable fields are contained between two 12h delimiters.

  E.g.:
  Base message on jet 1:
  WEIGHT: 12h xxx 12h Grams - PRICE: 12h xxxxx 12h Frs - 12h xxxx 12h Euros

  Sending of variable fields:
  4Ah 00h0Dh 01h 32517.752.69 xxh

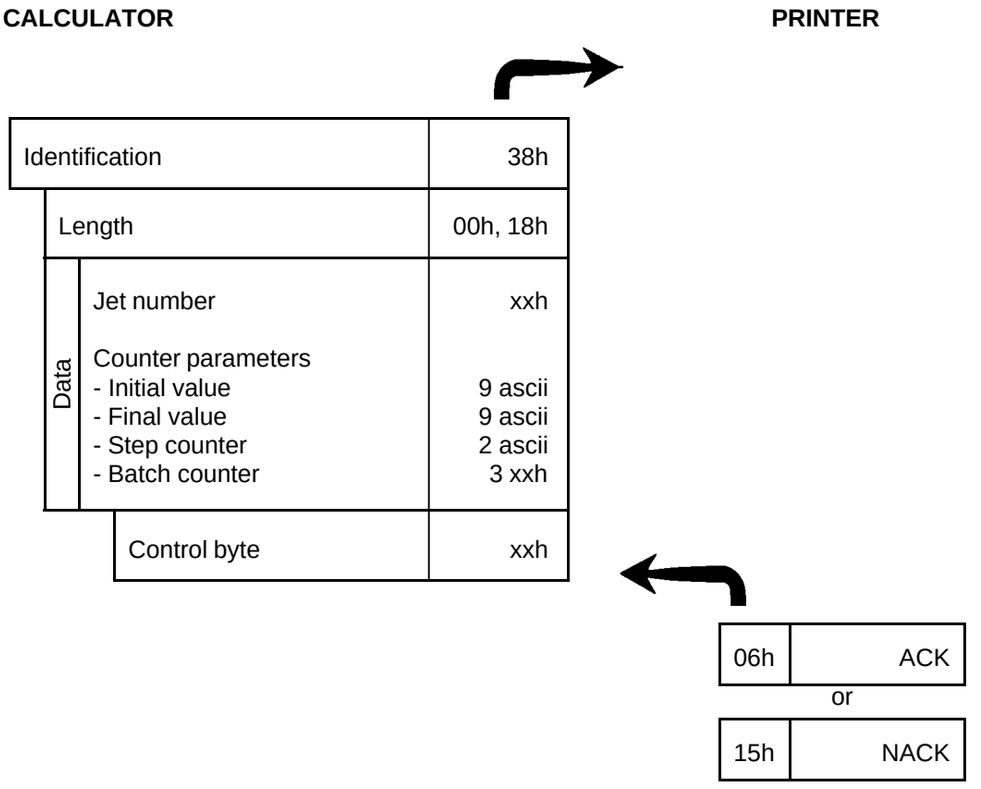
  Ident. Length N° jet 12 charac. ASCII Control

  Print message:
  WEIGHT: 325 Grams - PRICE: 17.75 Frs - 2.69 Euros

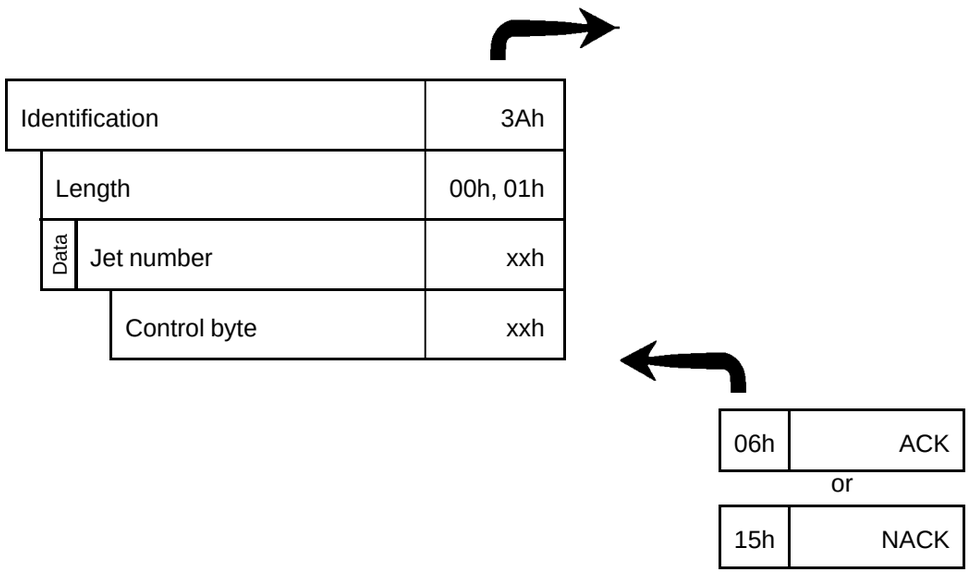
4 Sendings concerning the variable elements (counter, hour code, autoclock)

4.1 Sending the parameters of a counter

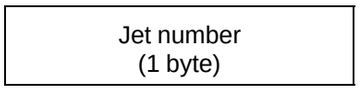
With this command it is possible to modify the parameters of a current message counter: that is to say, those selected for printing.



4.2 Resetting the counters



Detail of the data bytes



Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

4.3 Sending the shift code parameters

CALCULATOR → **PRINTER**

Identification		3Dh
Length		00h, 06h
Data	Jet number	xxh
	Starting time (2 bytes)	xxh, xxh
	Interval (2 bytes)	xxh, xxh
	Type code (1 byte)	xxh
Control byte		xxh

PRINTER → **CALCULATOR**

06h	ACK

or

15h	NACK

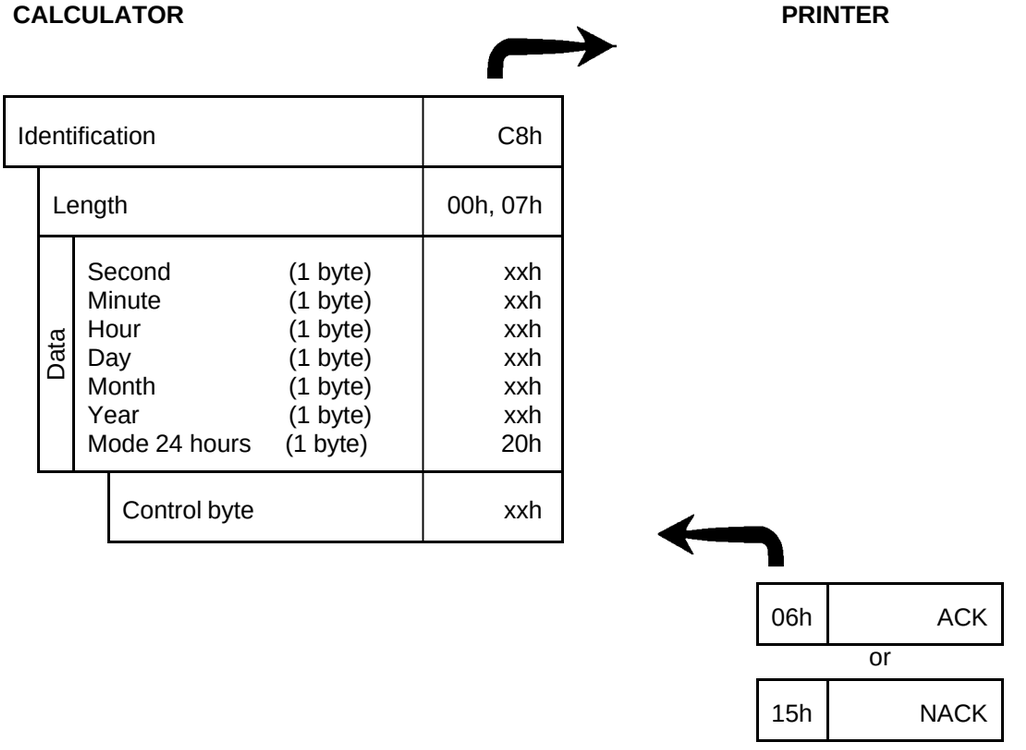
Detail of the data bytes

Jet number 1 byte	Starting time 2 bytes	Interval 2 bytes	Type code 1 byte
	From 00 hours 00 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes	From 00 hours 01 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes	00h = 2 figured data code FFh = alphabetical code (complete alphabet) 7Fh = alphabetical code (less O and I)

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

4.4 Initialisation of autoclock

CALCULATOR **PRINTER**



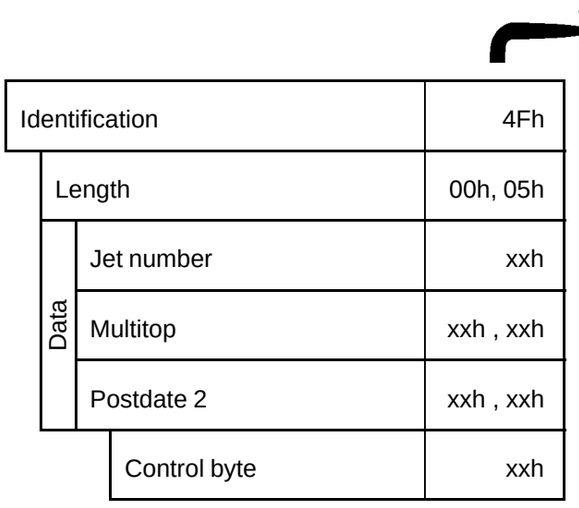
All the data bytes, except the 24h mode, are coded in BCD (Binary Coded Decimal). The units are represented by the least significant half-byte.

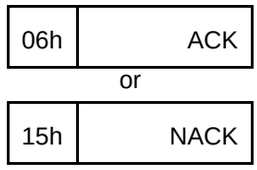
The minimum and maximum values of these bytes are in decimal:

- second from 00 to 59
- minute from 00 to 59
- hour from 00 to 23
- day from 00 to 31
- month from 00 to 12
- year from 00 to 99

4-5 Sending a Multitop per head and postdate 2 per jet

CALCULATOR **PRINTER**





Details of the data

- "Multitop" bytes:

This is the number of a message to be printed per DTOP (default value = 1).
The multitop value must be identical for all the jets on a head.

It must be specific to each head in the case of 2-head printers.
The multitop value for head 1 must be entered at jet 1 (master jet).
The multitop value for head 2 must be entered at jet 3 (master jet).

- "Postdate 2" bytes: (from 0 to 9999 days) or (from 0 to 1872 months), bit 14 to bit 0
  - unit in days = 0 in bit 15
  - unit in months = 1 in bit 15

S4 printers:
The second postdate can only be accessed via V24.
It can be different for each jet but is the same for all the messages assigned to any given jet. To obtain a different postdate 2 for another message, it is necessary to transmit the new postdate interval using the command **4Fh**.

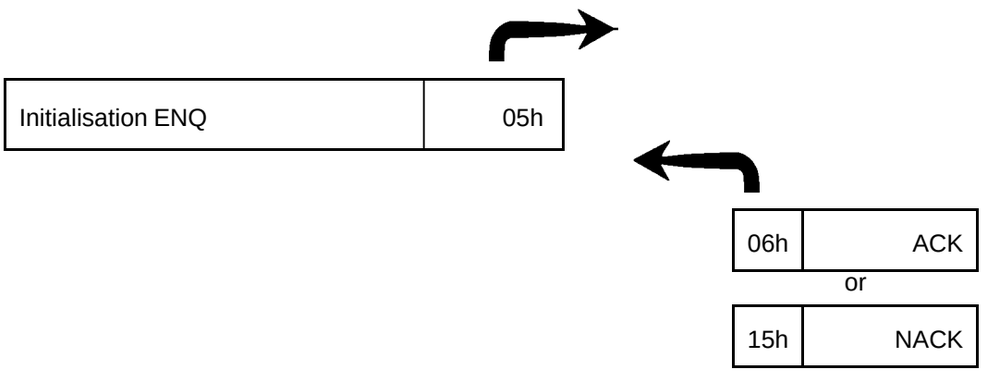
S4 Plus printers:
The second postdate is accessible via the printer's operator interface.
It is included in the messages and can be different for each jet and each message.

ATTENTION	**If the message is selected via the machine's parallel interface, operation remains identical to that described in the case of S4 printers.**

5 Requests concerning the printer

5.1 Request for V24 dialog

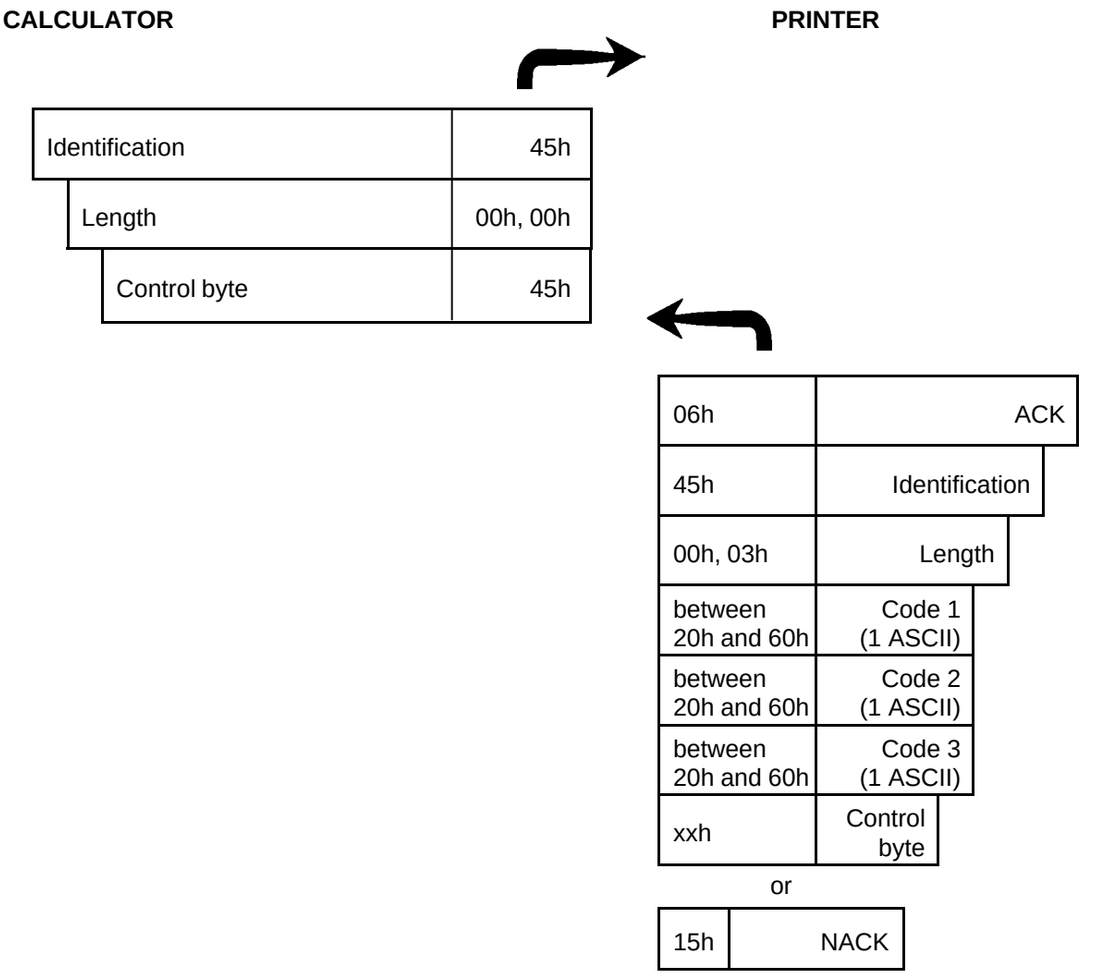
This request is optional. It enables the user, however, to ensure that the printer is "ready" to dialog. It can therefore by sent prior to each exchange.



The answer from the printer is NACK:

- if the liaison is locked by the security code,
- if the menu is being modified from the keyboard.

5.2 Request of keyboard code



5.3 Request for printer's parameters

CALCULATOR → **PRINTER**

Identification	20h
Length	00h, 00h
Control byte	20h

PRINTER → **CALCULATOR**

06h	ACK	
20h	Identification	
00h, 1Ah	Length	
4 ASCII	- Motor speed (S4) (rpm) or - Transfer time (SI) (s)	Data
20h	- Space	
4 ASCII	- Pressure (x, xx) (bar)	
20h	- Space	
2 ASCII	- Viscosimeter filling time (s)	
20h	- Space	
2 ASCII	- Number of additive addition	
20h	- Space	
4 ASCII	- Average jets speed (m/s) (xx, x)	
20h	- Space	
2 ASCII	- T° of the electronic compartment (°C)	
20h	- Space	
2 ASCII	- T° ink circuit (°C)	
xxh	Control byte	

or

15h	NACK

5.4 Request for the status of the ink circuit electrovalves, levels, measured viscosity, reference viscosity, number of times additive has been added

CALCULATOR → **PRINTER**

Identification	35h
Length	00h, 00h
Control byte	35h

06h	ACK	
35h	Identification	
00h, 05h	Length	
xxh	State of the ELV of the CE (1 byte)	Data
xxh	Levels (1 byte)	
xxh	Visco (s) (1 byte)	
xxh	Reference visco (s) (1 byte)	
xxh	Number of additive (1 byte)	
xxh	Control byte	

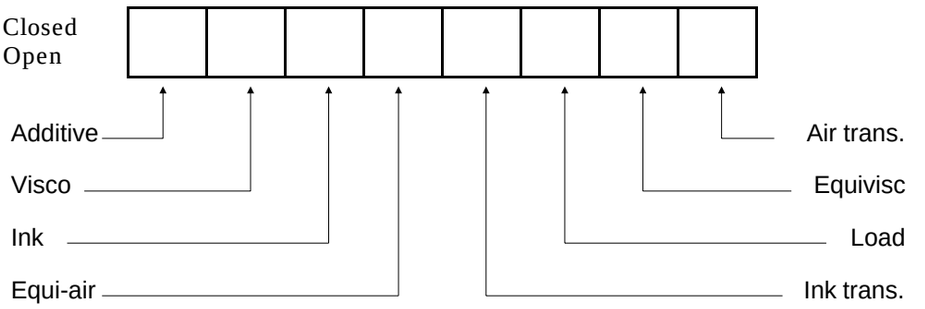
or

15h	NACK

Detail of the data bytes

- Byte of the ELV of the CE:

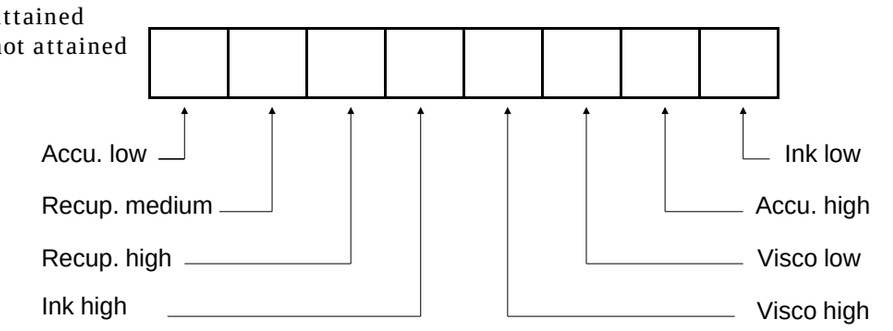
State 0 = Closed
State 1 = Open



NOTE **On S4SI and S4SI Plus, all these solenoid valves are used. On the other printers in the Jaime 1000 range, only the Additive and Visco. solenoid valves are used.**

- Levels byte:

State 0 = Level attained
State 1 = Level not attained



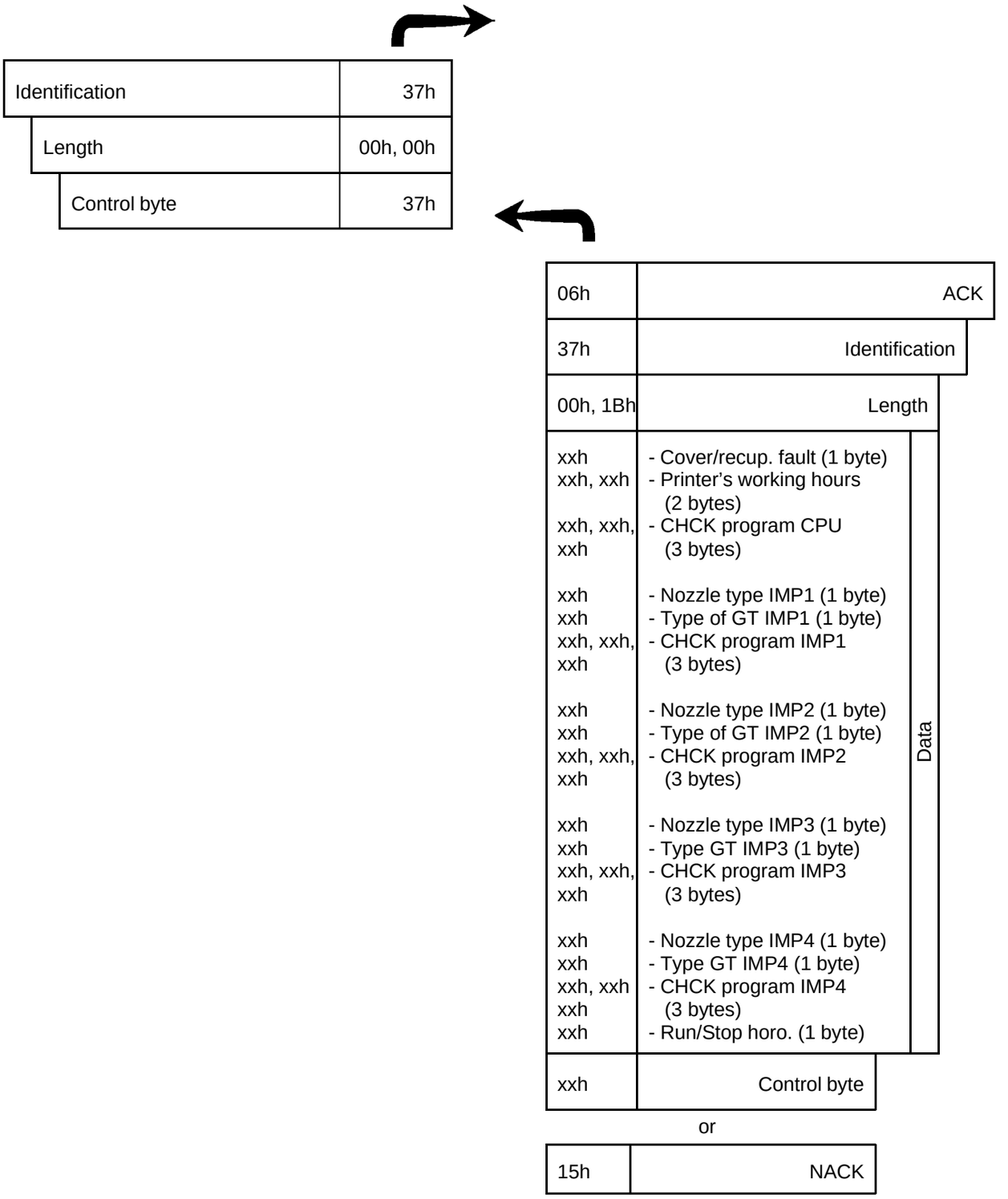
- Viscosity byte:
  The value represents the filling time of the viscometer in seconds, in hexadecimal coding.

- Visco reference byte:
  Visco reference time in seconds, in hexadecimal coding.

- Additives byte:
  Number of additions in hexadecimal coding.

5.5 Request for printer's CRC Proms

CALCULATOR **PRINTER**



Identification	37h
Length	00h, 00h
Control byte	37h

06h	ACK	
37h	Identification	
00h, 1Bh	Length	
xxh xxh, xxh xxh, xxh, xxh xxh xxh xxh, xxh, xxh xxh xxh xxh, xxh, xxh xxh xxh xxh, xxh xxh xxh	- Cover/recup. fault (1 byte) - Printer's working hours (2 bytes) - CHCK program CPU (3 bytes) - Nozzle type IMP1 (1 byte) - Type of GT IMP1 (1 byte) - CHCK program IMP1 (3 bytes) - Nozzle type IMP2 (1 byte) - Type of GT IMP2 (1 byte) - CHCK program IMP2 (3 bytes) - Nozzle type IMP3 (1 byte) - Type GT IMP3 (1 byte) - CHCK program IMP3 (3 bytes) - Nozzle type IMP4 (1 byte) - Type GT IMP4 (1 byte) - CHCK program IMP4 (3 bytes) - Run/Stop horo. (1 byte)	Data
xxh	Control byte	

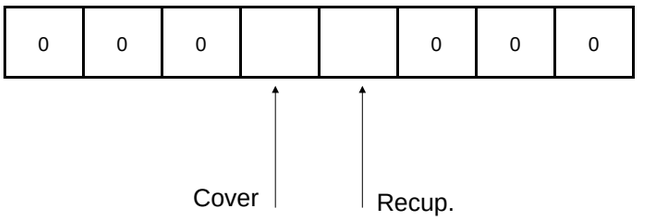
or

15h	NACK

Detail of the data bytes

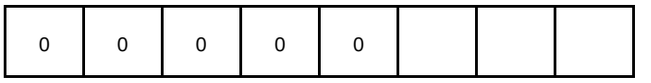
- Byte "Cover/recup. fault":

State 0 = active fault
State 1 = inactive fault



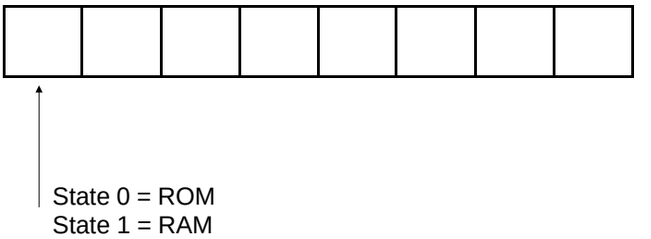
- Byte "Printer's working hours":
Printer operation time is expressed in hours and coded in hexadecimal on 2 bytes.-

- Byte "Nozzle type IMP":



Nozzle G:	0	0	0
Nozzle M:	1	0	0
Nozzle P:	1	1	0

- Byte "Type of GT IMP":



- Byte "Run/Stop horo.":

00h = Run FFh = Stop

5.6 Request for printer's faults

This command does not cancel the faults.

CALCULATOR → **PRINTER**

Identification	3Bh
Length	00h, 00h
Control byte	3Bh

← **PRINTER**

06h	ACK	
3Bh	Identification	
00h, 11h	Length	
xxh	Faults	Data
xxh	- General	
xxh	- Hard (CPU)	
xxh	- Printer	
xxh	- Hard IMP jet 1	
xxh	- IMP jet 1	
xxh	- Head jet 1	
xxh	- Hard IMP jet 2	
xxh	- IMP jet 2	
xxh	- Head jet 2	
xxh	- Hard IMP jet 3	
xxh	- IMP jet 3	
xxh	- Head jet 3	
xxh	- Hard IMP jet 4	
xxh	- IMP jet 4	
xxh	- Head jet 4	
xxh	- Phase	
xxh	- Sub-phase	
xxh	Control byte	

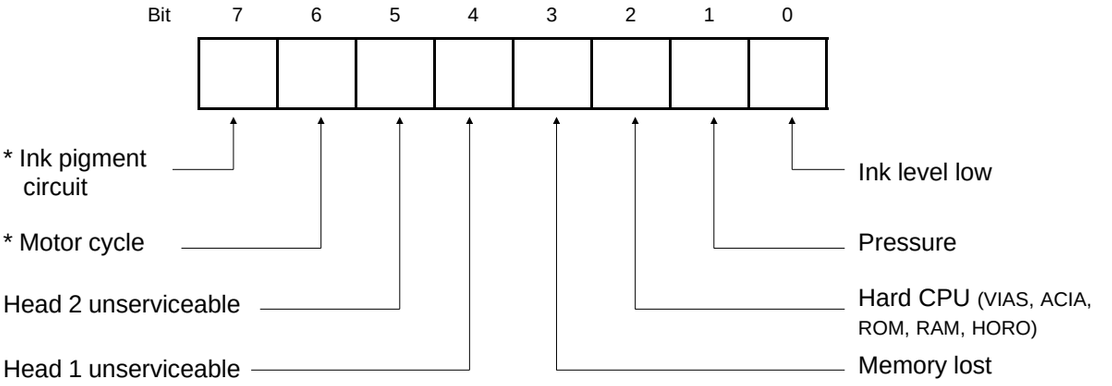
or

15h	NACK

Detail of the data bytes

- Byte: message general parameters

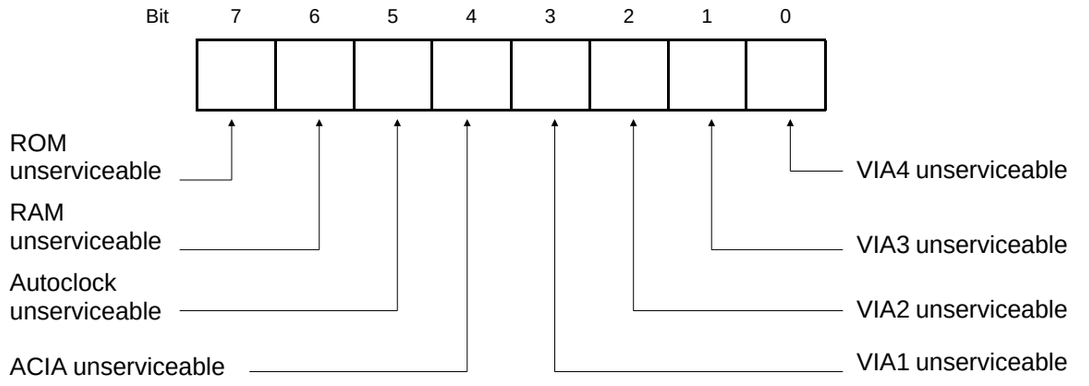
  State 0 = no fault
  State 1 = fault



* The bit 7 is significant on S4SI and S4SI Plus only.
* The bit 6 is not significant on S4SI and S4SI Plus only.

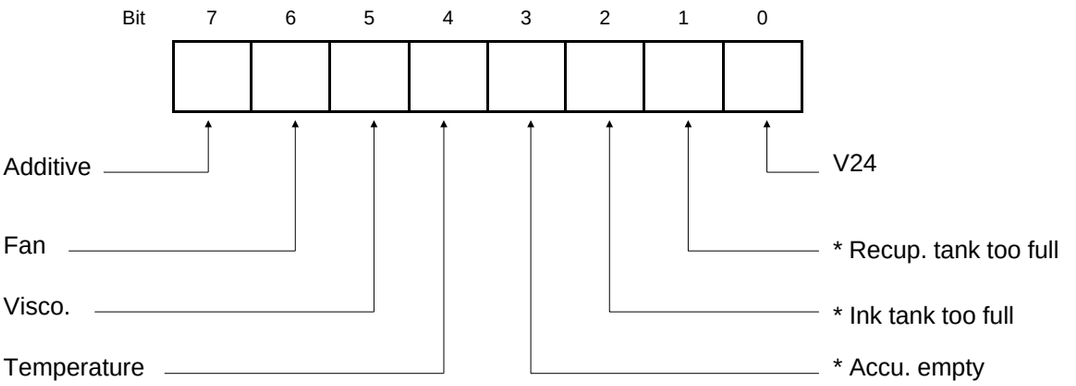
- Byte: Hard fault (CPU)

  State 0 = no fault
  State 1 = fault



- Byte: printer's faults

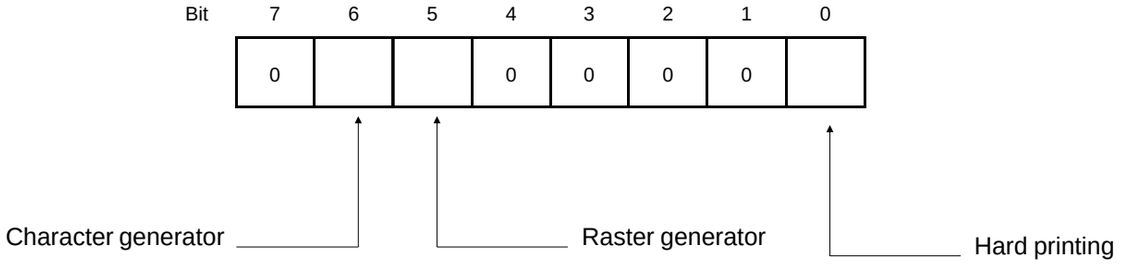
  State 0 = no fault
  State 1 = fault



* The bits 1, 2 and 3 are significant on S4SI and S4SI Plus only.

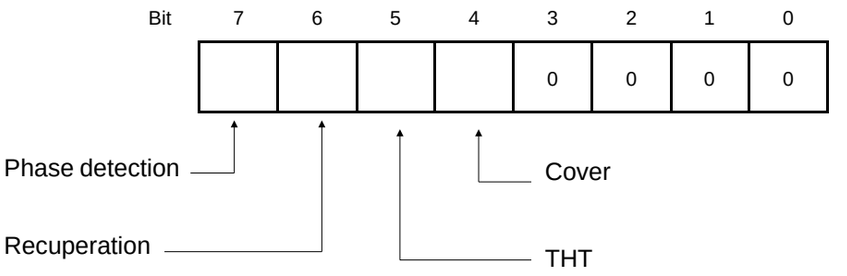
- Byte: Hard fault IMP jet

  State 0 = no fault
  State 1 = fault



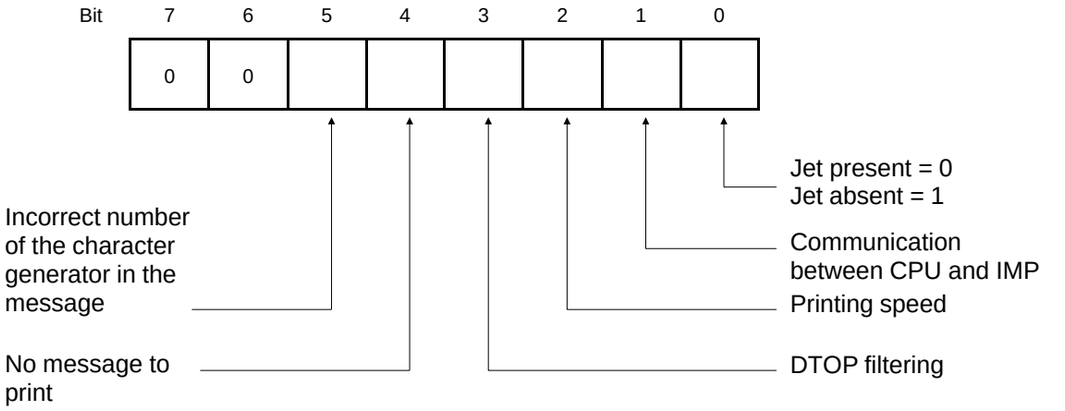
- Byte: IMP jet fault

  State 0 = no fault
  State 1 = fault



- Byte: Head fault

  State 0 = no fault
  State 1 = fault

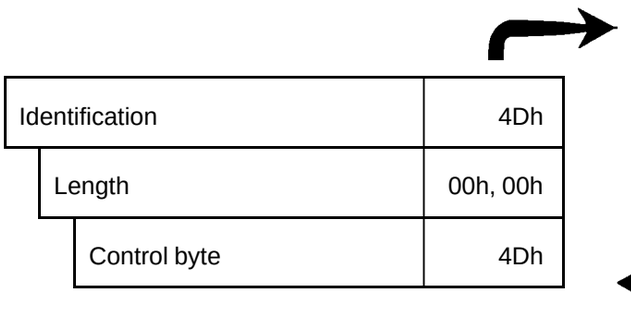


- Byte: phase (on S4SI and S4SI Plus only)
  ------> Nr of the phase at fault

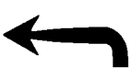
- Byte: Sub-phase (on S4SI and S4SI Plus only)
  ------> Nr of the sub phase at fault

5.7 Status request for S4SI

CALCULATOR **PRINTER**



Identification	4Dh
Length	00h, 00h
Control byte	4Dh



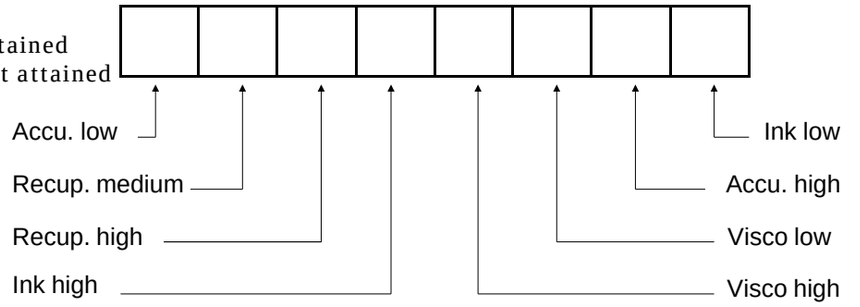
06h	ACK	
4Dh	Identification	
00h,09h	Length	
xxh	Number of IC phase	Data
xxh	Number of IC subphase	
xxh,xxh	Time of subphase	
xxh	Levels	
xxh	Electrovalves	
xxh	AP and discharge electrovalves	
xxh	Pressure	
xxh	End of phase (stand-by mode)	
xxh	Control byte	

Details of the data bytes

- "Subphase time" bytes:
  Time expressed in tenths of a second in two bytes.

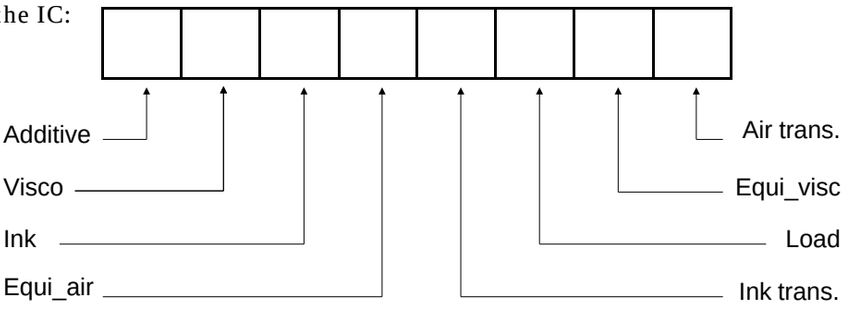
- Levels byte:

  State 0 = Level attained
  State 1 = Level not attained



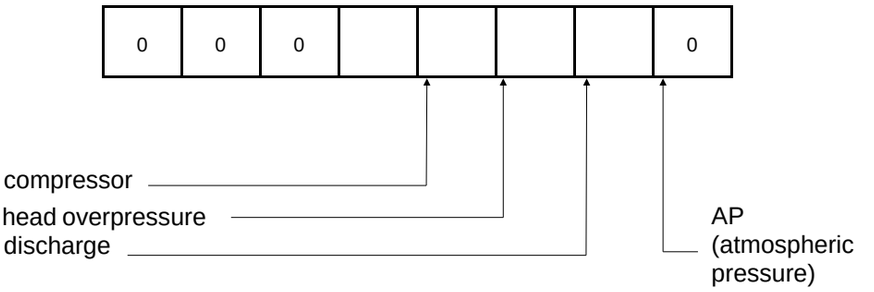
- Byte of the ELV of the IC:

  State 0 = closed
  State 1 = open



- Byte of the AP and discharge electrovalves:

  State 0 = closed
  State 1 = open



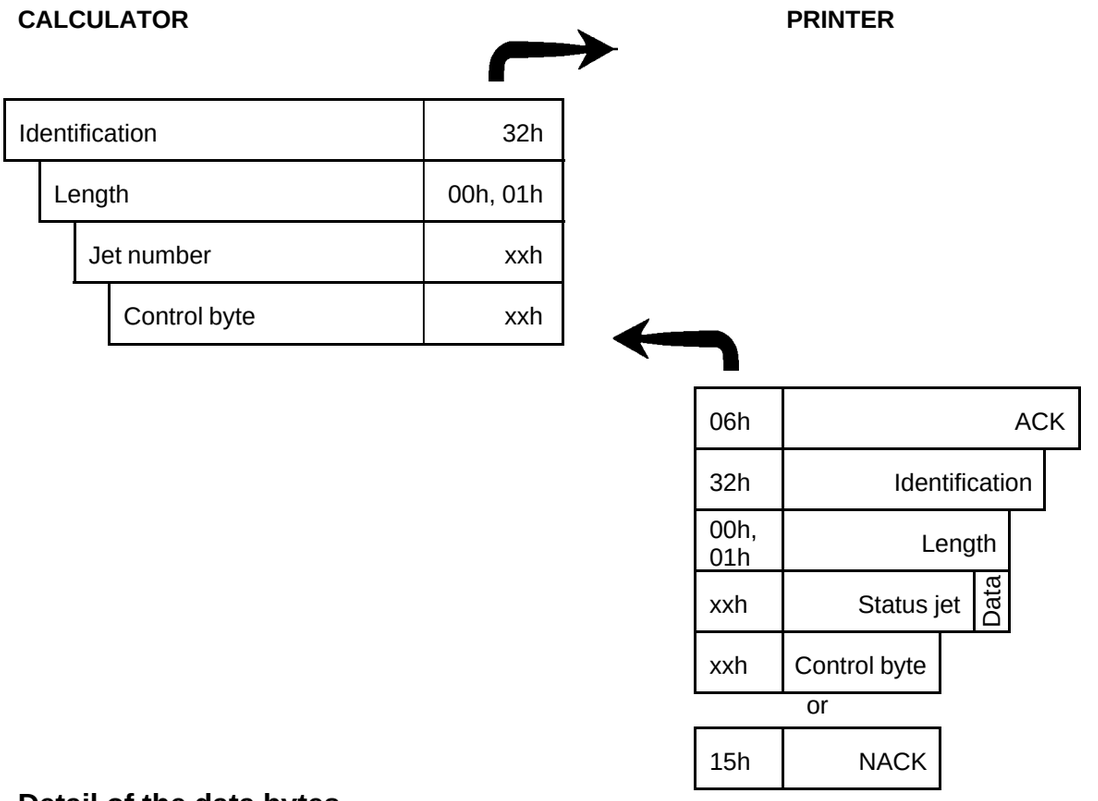
- "Pressure" byte:

  The printer sends one hexadecimal byte, representing the pressure in decimal.
  Calculation of the pressure in millibars:
  - pressure in decimal x 19.6 for heads M/G.
  - pressure in decimal x 39.2 for head P.

- "End of phase" byte: (stand-by mode)
  00h for active phase.
  FFh for end of phase.

6 Requests concerning the heads

6.1 Request for the status jet



Detail of the data bytes

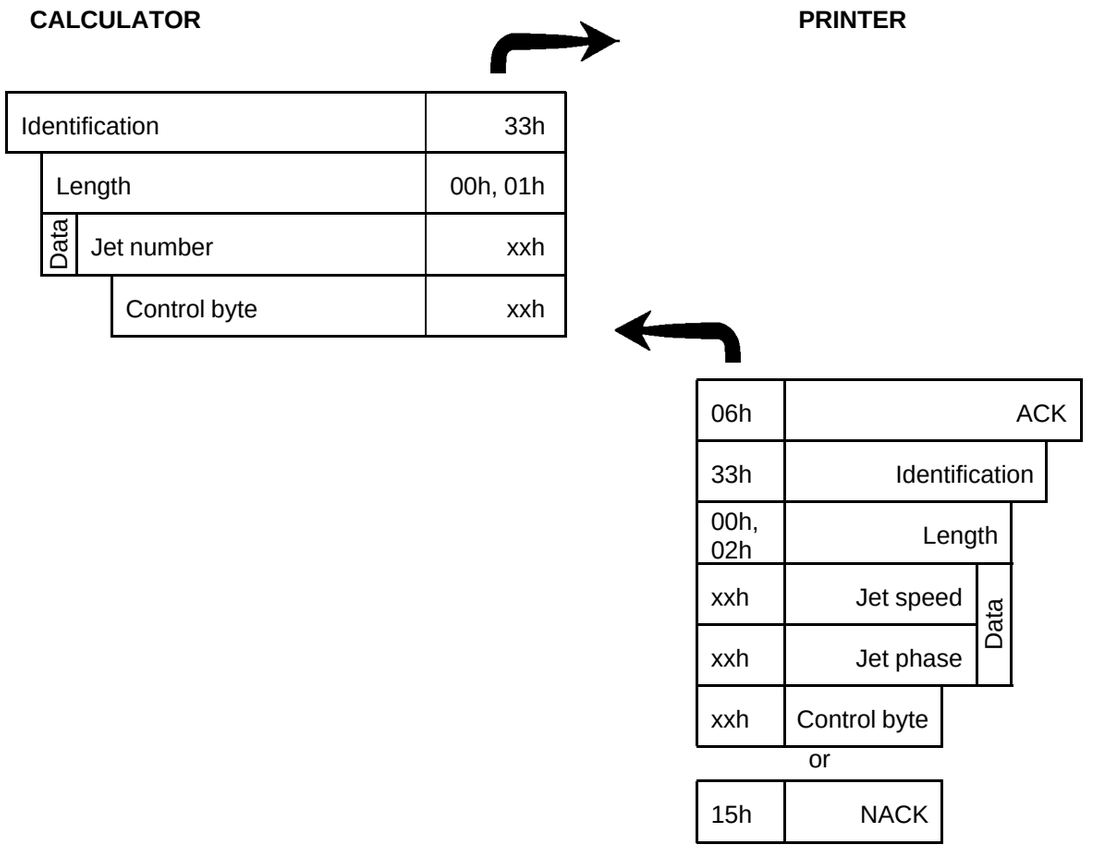
- Byte "Jet number":

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

- Byte "Status jet":

00h = Jet halted
01h = Jet in start-up phase
02h = Jet in refreshment
03h = Jet in stability check
04h = Jet in solution introduction
05h = Jet in nozzle unblocking
06h = Setting
07h = Jet running

6.2 Request for the jet and phase speed



Detail of the data bytes

- "Jet number" byte:

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

- "Jet speed" byte:
  The jet speed is expressed in tenths of a metre per second, coded in hexadecimal on 1 byte.
- "Jet phase" byte:
  8 bits that can each take value 0 or 1.

7 Requests concerning the message

7.1 Request for the complete current message

CALCULATOR → **PRINTER**

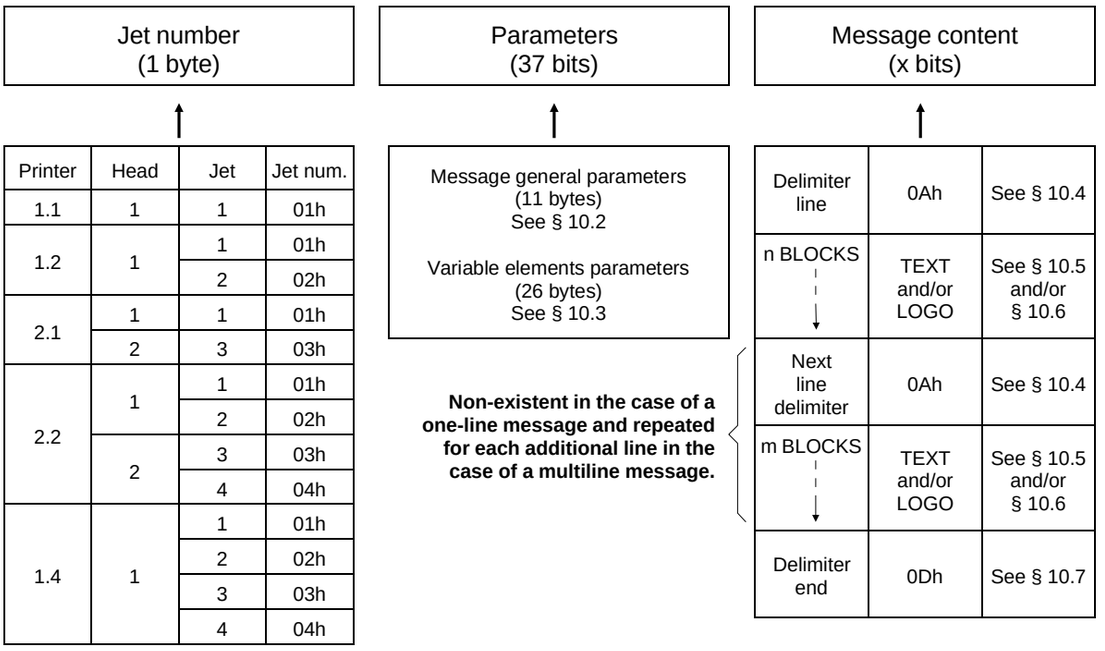
Identification	43h
Length	00h, 01h
Data: Jet number	xxh
Control byte	xxh

06h	ACK
43h	Identification
00h, xxh	Length
xxh ... xxh	Data: Parameters (37 bytes) / Message content (x bytes)
xxh	Control byte

or

15h	NACK

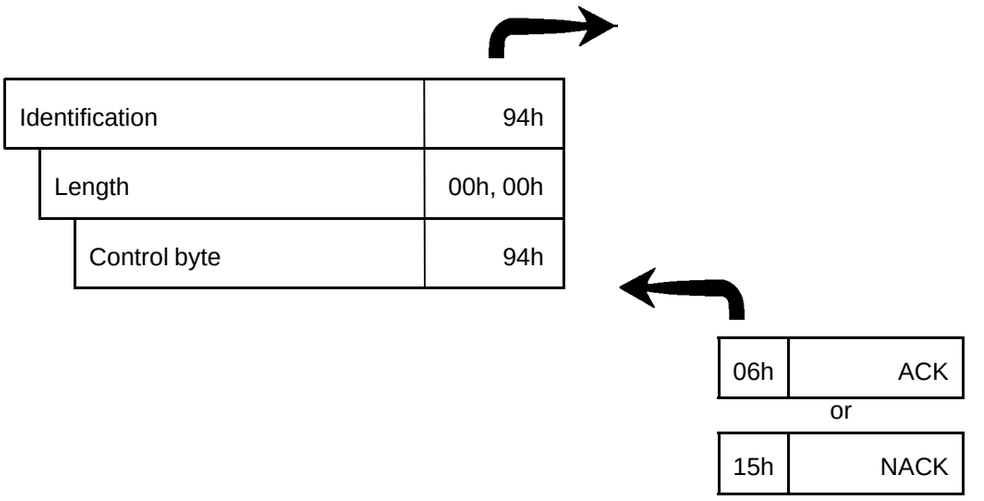
Detail of the data bytes



Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

7.2 Command of printing

This command orders printing to the head(s). The printer should be configured in manual auto or manual object.



The response ACK is delivered if printing is effectively commanded (no verification of the printing done is carried out).

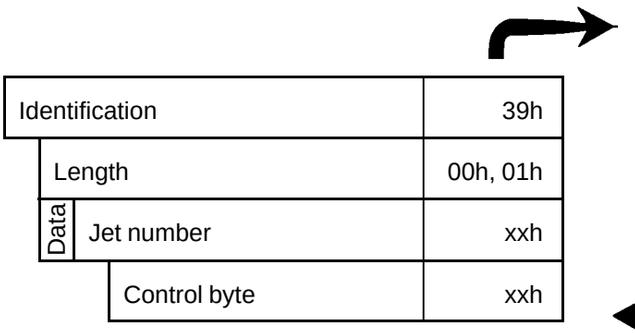
The response NACK signifies:
- The printing mode is different of the object manual or the auto manual.
- The printing has not started.

NOTE **In "object manual" mode a single printing is triggered by this command.**
In "auto manual" the first command triggers the printing, the message is repeated until a second command stops the printing.

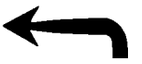
8 Requests concerning the variable elements

8.1 Request for current counters

CALCULATOR **PRINTER**



Identification	39h
Length	00h, 01h
Data: Jet number	xxh
Control byte	xxh

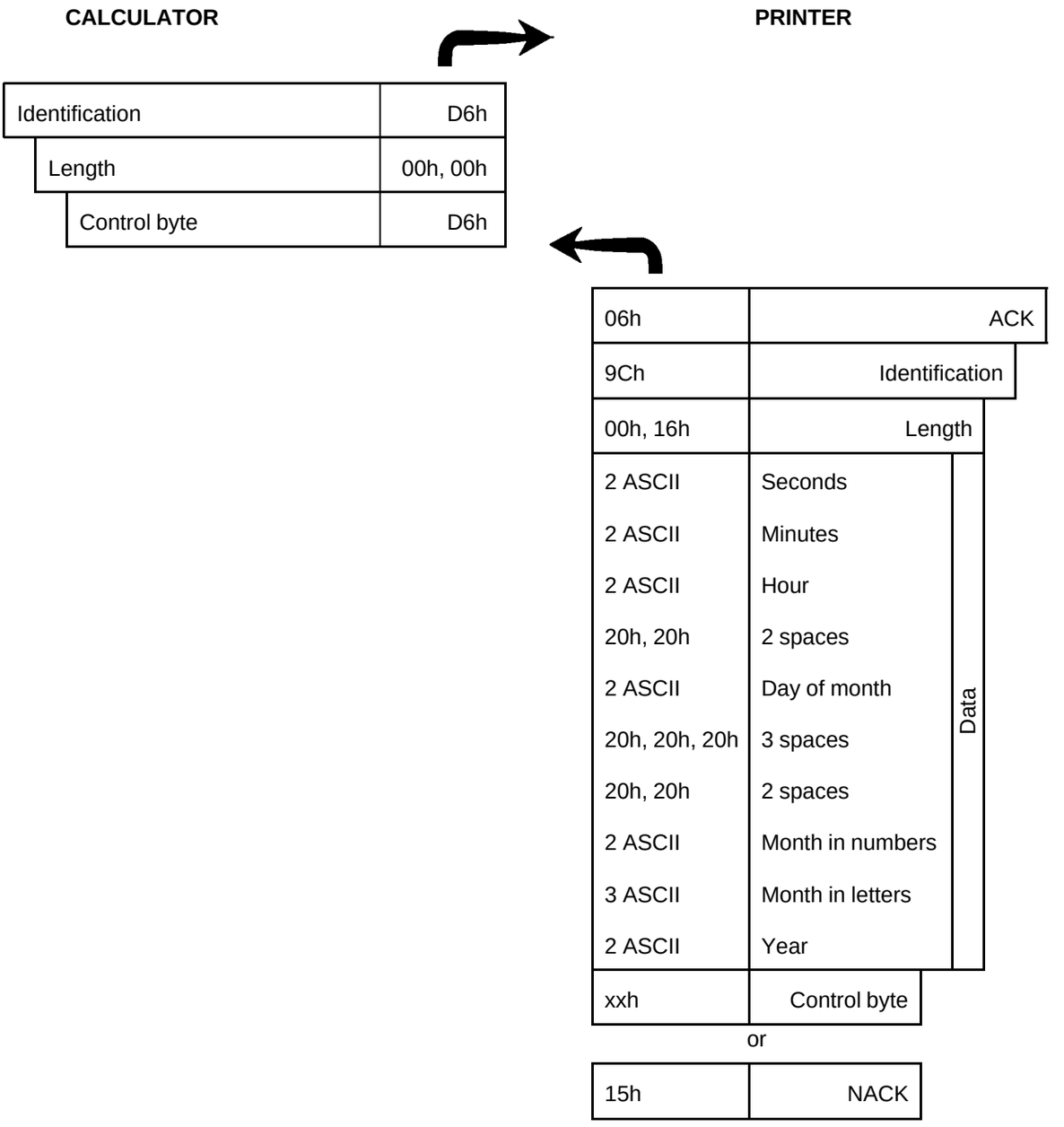


06h	ACK
39h	Identification
00h, 0Ch	Length
9 ASCII Current value of the counter 3 xxh Current value of the batch	Data
xxh	Control byte

or

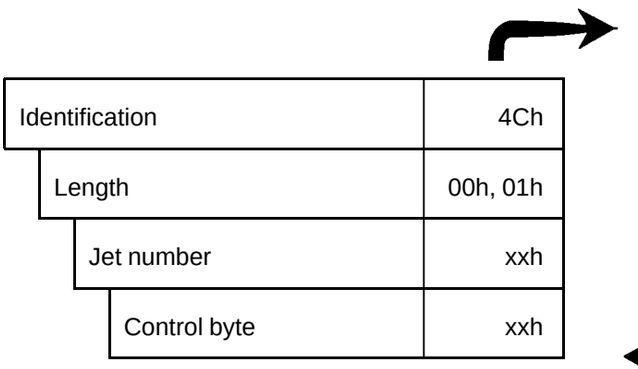
15h	NACK

8.2 Request for autoclock

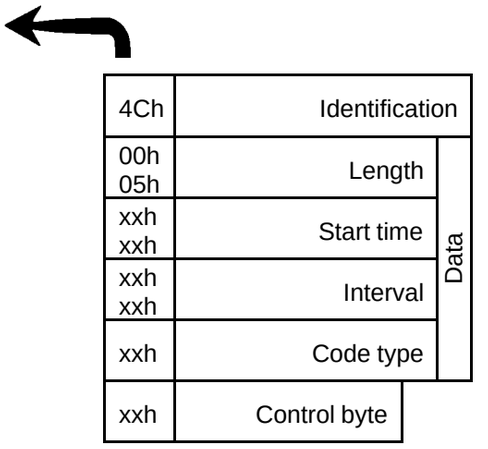


8.3 Request for shift code parameters

CALCULATOR **PRINTER**

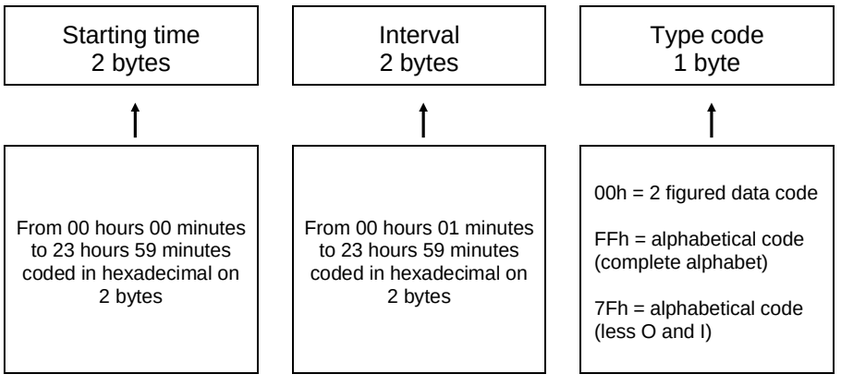


Identification	4Ch
Length	00h, 01h
Jet number	xxh
Control byte	xxh



4Ch	Identification	
00h 05h	Length	Data
xxh xxh	Start time	
xxh xxh	Interval	
xxh	Code type	
xxh	Control byte	

Detail of the data bytes



Starting time 2 bytes	Interval 2 bytes	Type code 1 byte
From 00 hours 00 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes	From 00 hours 01 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes	00h = 2 figured data code FFh = alphabetical code (complete alphabet) 7Fh = alphabetical code (less O and I)

9 General message structures

9.1 General structure of a one-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
0Ah: delimiter of start of line	(1 byte)
Line 1: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Dh: delimiter of end of message	(1 byte)

9.2 General structure of a two-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
0Ah: delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Dh: delimiter of end of message	(1 byte)

9.3 General structure of a three-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
0Ah: delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 3	(1 byte)
Line 3: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Dh: delimiter of end of message	(1 byte)

9.4 General structure of a four-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
0Ah: delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 3	(1 byte)
Line 3: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Ah: delimiter of start of line 4	(1 byte)
Line 4: subdivided into blocks	(from 0 bytes if line blank to n bytes)
0Dh: delimiter of end of message	(1 byte)

10 Detail of the data bytes

10.1 Jet number: from 1 to 4 (1 byte in hexadecimal)

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

10.2 General parameters of a message (11 bytes)

Message sense	0 = normal	/	1 = inverted	b7	1 byte
Horizontal sense of the characters	0 = normal	/	1 = inverted	b6	
Vertical sense of the characters	0 = normal	/	1 = inverted	b5	
Tachometer mode	0 = no	/	1 = yes	b4	
Manual mode	0 = no	/	1 = yes	b3	
Command mode	0 = object	/	1 = repetitive	b2	
NU	0			b1	
Mode DIN	0 = no	/	1 = yes	b0	
Printing speed in mm/s or tachometer division	(2 bytes binary)				2 bytes
Forward margin in mm	(2 bytes binary)				8 bytes
Return margin in mm	(2 bytes binary)				
Interval in mm	(2 bytes binary)				
Object top filter in µsec	(2 bytes binary)				

Minimum and maximum values of the general parameters :

Printing speed	0001 to 9999 mm/s
Tachometer division	0001 to 9999
Forward margin	0001 to 9999 mm
Return margin	0001 to 9999 mm
Interval margin	0001 to 9999 mm
Filtering	0100 to 9999 µsec

10.3 Parameters of variable elements

Printing of leading zeros		0 = no	/ 1 = yes	b7	1 byte
Counter incrementing on		0 = object	/ 1 = message	b6	
Reset of object top counter		0 = no	/ 1 = yes	b5	
Increasing / decreasing		0 = inc	/ 1 = dec	b4	
Number of figures printed 1 to 9 (4 bytes)				b3 to b0	
Initial value		(9 bytes ASCII)			23 bytes
Final value		(9 bytes ASCII)			
Step counter		(2 bytes ASCII)			
Lot counter		(3 bytes binary)			
Postdate	unit	0=day	/ 1 = month	b15	2 bytes
	interval	in days	or in months	b14 to b0	

Maximum and minimum values of the variable elements: (in decimal)

Initial value	000000000 to 999999999
Final value	000000000 to 999999999
Increase step counter	01 to 99
Lot counter	000001 to 999999
Postdate interval	0000 to 9999 days or 0000 to 1872 months

10.4 Delimiter of beginning of line: (0Ah)

This delimiter is the same for all lines.

10.5 Block

Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	TEXT

10.5.1 Bolderization

From 1 to 9 (1 byte hexadecimal).

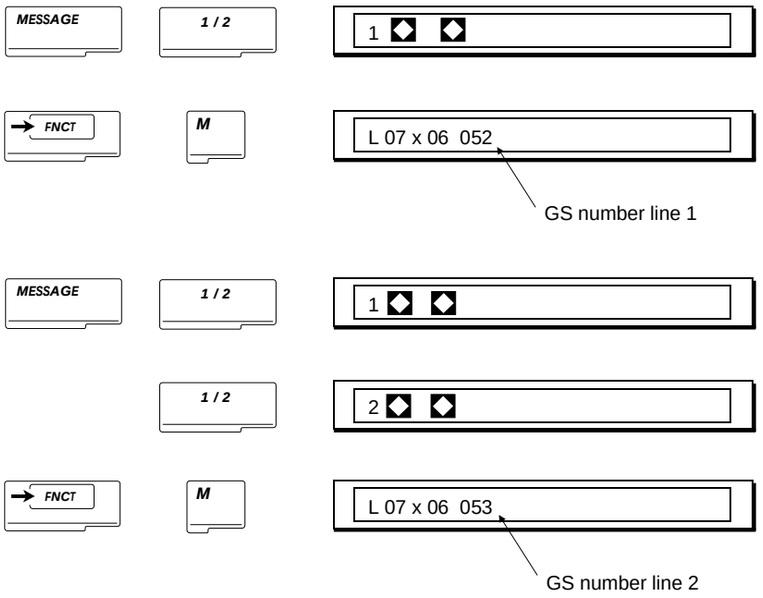
10.5.2 Symbol Generator

- **On S4:**

The symbol generators accessible in the printer can be visualised on the display of the printer.

NOTE **The symbol generator numbers are different on line 1 and 2. Display each number on the corresponding line.**
The symbol generator numbers 255 to 241 are reserved for logos.

Example:



- **On S4 Plus:**

  The symbol generators are designated by a name. This name corresponds to a number which you can find in one of the tables below.

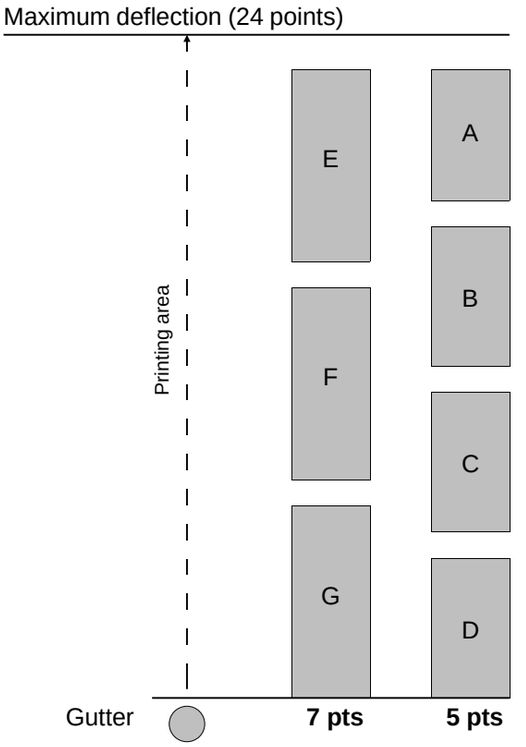
Table 1

Fonts name	No
ARA16139	065
ARA24139	099
CYR16109	068
CHE5_1	58
CHE7_1	60
DAMIER	254
DI24_036	027
DS24_036	028
GRE16117	071
GRE24117	077
HEB16BAM	74
HEB24BAM	78
IG11_135	040
IG11_136	140
IGG11135	041
IN16_135	018
J1000	255
NY16_135	008
OC11_088	098
OC11_135	031
OC16_061	034
OC16_095	033
OC16_136	032
OC16_ITF	146
OCG11136	042
OCNU_ITF	147
OCR09_P1	144
PARAL	253
SCI11119	075
SCI16119	062
SIN09110	079
SIN11118	054
SIN16119	056
SIN24058	057

COMMENTS **A maximum of 15 fonts can be downloaded to the printer interface. A maximum of 10 fonts can be used simultaneously in a message.**

Table 2: Positions of the 5 and 7-point fonts in the printing area

Fonts name	Position	No
ARA07139	F	063
	G	064
CYR07109	F	066
	G	067
GRE07116	F	069
	G	070
HEB07BAM	F	72
	G	73
IN05_1	C	50
	D	51
IN05_2	C	201
	D	202
IN07_1	F	52
	G	53
IN07_134	F	013
	G	014
OC07_086	F	029
	G	030
SCI05084	C	58
	D	59
SCI07119	F	60
	G	61
SIN05116	C	083
	D	084
SIN5H116	A	166
	B	167
SIN07118	F	52
	G	53
SIN7H118	E	160



10.5.3 Detail of TEXT

ASCII characters and/or Counter and/or Autoclock and/or Bar code and/or Tabulation and/or variable fields

- ASCII Characters: keyboard keys
- Counter: 1Ch (1 byte hexa)
- Autoclock:

Delimiter 1Ah	1 or more elements from the autoclock	Delimiter 1Ah

Elements of the autoclock:

41h 42h	= second (00 to 59)	(2 bytes ASCII)
43h 44h	= minutes (00 to 59)	(2 bytes ASCII)
45h 46h	= hours (00 to 23)	(2 bytes ASCII)
49h 4Ah	= day of the month (01 to 31)	(2 bytes ASCII)
4Bh 4Ch 4Dh	= day of the year (01 to 366)	(3 bytes ASCII)
4Eh 4Fh	= week of the year (01 to 53)	(2 bytes ASCII)
50h 51h	= month of the year (01 to 12)	(2 bytes ASCII)
52h 53h 54h	= month of the year in letters (JAN to DEC)	(3 bytes ASCII)
55h 56h	= year (00 to 99)	(2 bytes ASCII)
57h 58h	= postday of the month (01 to 31) first postdate	(2 bytes ASCII)

59h 5Ah 5Bh	= postday of the year (001 to 366) first postdate	(3 bytes ASCII)
5Ch 5Dh	= postweek of the year (01 to 53) first postdate	(2 bytes ASCII)
5Eh 5Fh	= postmonth of the year (01 to 12) first postdate	(2 bytes ASCII)
60h 61h 62h	= postmonth of the year in letters (JAN to DEC) first postdate	(3 bytes ASCII)
63h 64h	= postyear (00 to 99) first postdate	(2 bytes ASCII)
65h	= shift code in letter (A to Z)	(1 byte ASCII)
66h 67h	= shift code in number (01 to 99)	(2 bytes ASCII)
68h	= shift code in letters (A to Z - I -O)	(1 byte ASCII)
69h	= day of the week in number (1 to 7)	(1 byte ASCII)
6Dh **6Eh** **6Fh** **70h**	**= separator : (2 points)** **= separator / (slash)** **= separator . (point)** **= separator ␣ (space)**	**(1 byte ASCII)** **(1 byte ASCII)** **(1 byte ASCII)** **(1 byte ASCII)**

ATTENTION **The hex values of the separators above apply only between 2 autoclock delimiters.**

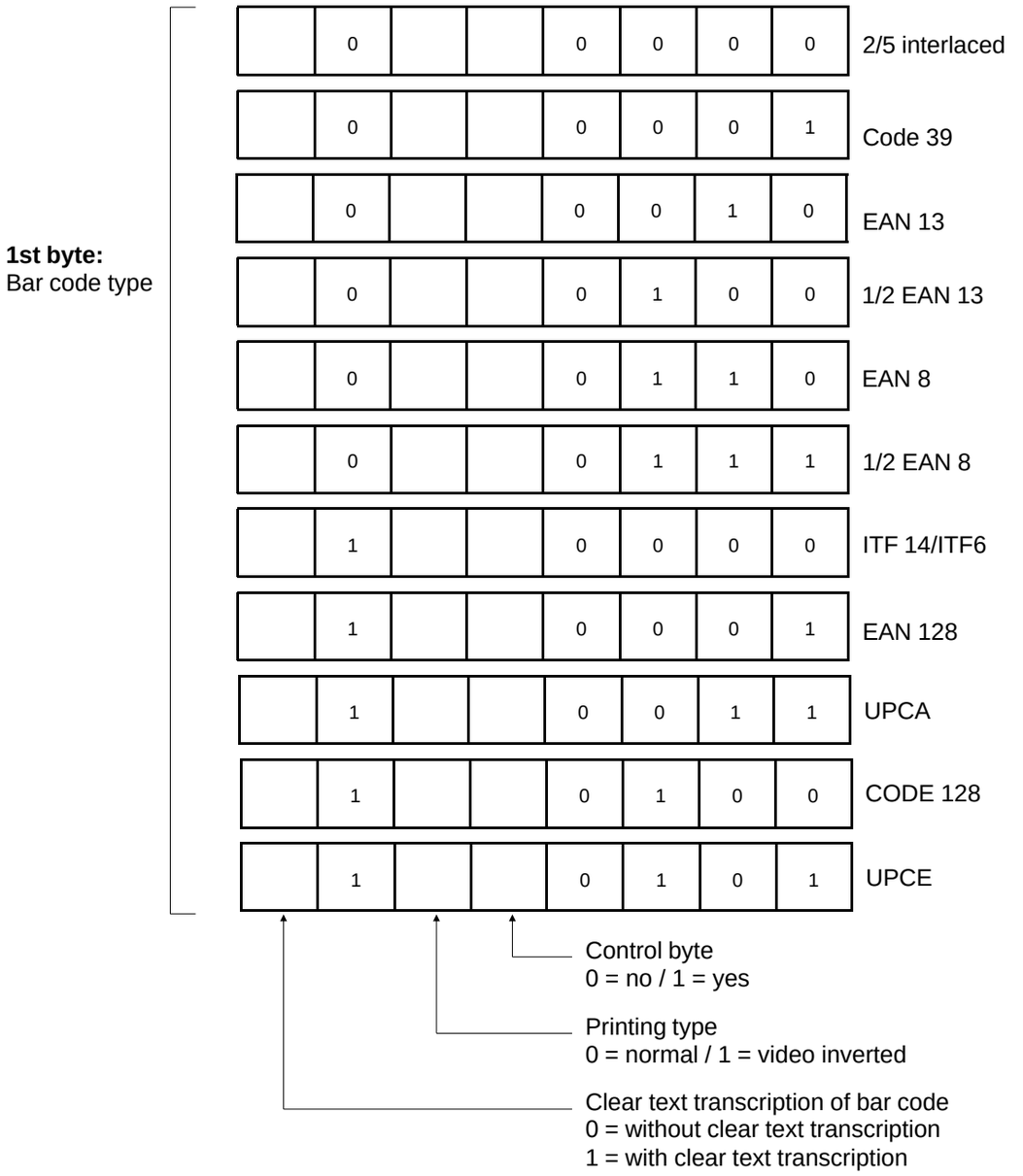
71h 72h	= postday of the month (01 to 31) second postdate	(2 bytes ASCII)
73h 74h 75h	= postday of the year (001 to 366) second postdate	(3 bytes ASCII)
76h 77h	= postweek of the year (01 to 53) second postdate	(2 bytes ASCII)
78h 79h	= postmonth of the year (01 to 12) second postdate	(2 bytes ASCII)
7Ah 7Bh 7Ch	= postmonth of the year in letters (JAN to DEC) second postdate	(3 bytes ASCII)
7Dh 7Eh	= postyear (00 to 99) second postdate	(2 bytes ASCII)

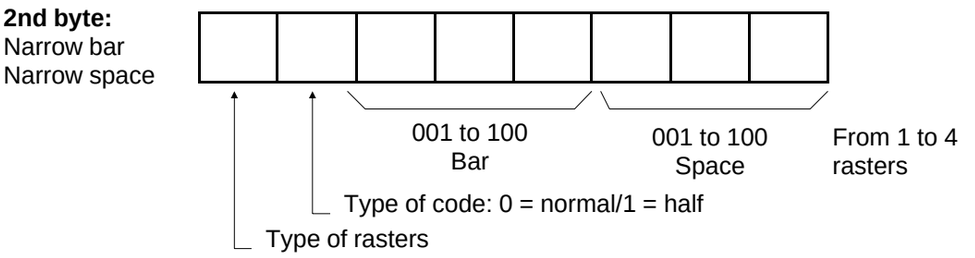
NOTE **All these elements are dissociated (ie: last digit of the year = 56h)**

- Bar Code

Delimiter 1Fh	Parameters (3 bytes)	BAR CODE CHARACTERS	Delimiter 1Fh

Detail of the parameters bytes:

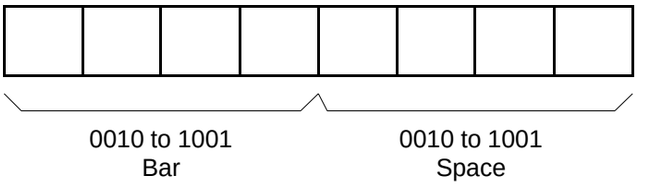




The following table specifies the type of raster as a function of the value of bit7.
The current raster is the full raster of the current generator.
The jet raster is the raster used to connect the jets

	BIT7 = 0	BIT7 = 1
CODE 39	Current raster	Jet raster
2/5 INTERLACED	Current raster	Jet raster
EAN13	Jet raster	Current raster
EAN8	Jet raster	Current raster
ITF14	Jet raster	Current raster
ITF6	Jet raster	Current raster
EAN128	Jet raster	Current raster
CODE128	Jet raster	Current raster
UPCA	Jet raster	Current raster
UPCE	Jet raster	Current raster

3nd byte:
Wide bar
Wide space



Ratio between narrow and wide elements:
A narrow element must be strictly smaller than a wide element.

WARNING	**For some bar codes, certain parameters are pre-defined (see printer manual).**

Bar Code characters:
Maximum length of a bar code: 32 characters included the control byte.

NOTE	**Maximum 4 bar code per message.**

- Tabulation:

Delimiter 1Eh	Number of empty raster (1 to 255) (1 byte hexa)	Delimiter 1Eh

- Variable fields:

Delimiter 12h	Non-significant ASCII characters (field size)	Delimiter 12h

10.6 Logo block/symbol

10.6.1 Logo on Serie 4

Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	! (21h)

- Bolderization: from 1 to 9 on 1 byte hexadecimal.
- Symbol Generator: from 255 to 241 (logo 1 : 255, logo 2 : 254 ... logo 15 : 241). The logo must be loaded into the printer to be printed.
- The key ! (21h) calls as many times as need the logo.

10.6.2 Symbol on Serie 4 Plus

Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	Symbol Number

- Bolderization: from 1 to 9 on 1 byte hexadecimal.
- Symbol generator: No. of font (from 201 to 255).
- No. of symbols in the font:
  Symbol No. 1 = 20h
  Symbol No. 2 = 21h
  etc...

10.7 Delimiter of end of message

This delimiter 0Dh marks the end of message.

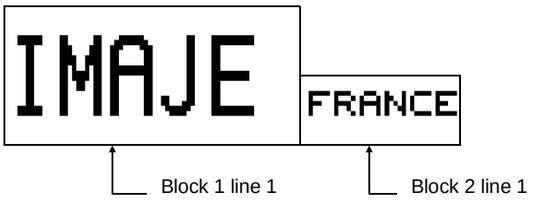
APPENDIX
(16 pages)

Contents

1 Examples of message programming

1.1 Transmission of a one-line message

Without parameters, on jet 1, outside of library, with fonts 16 x 12, No. 56 and 5x6 No. 84.

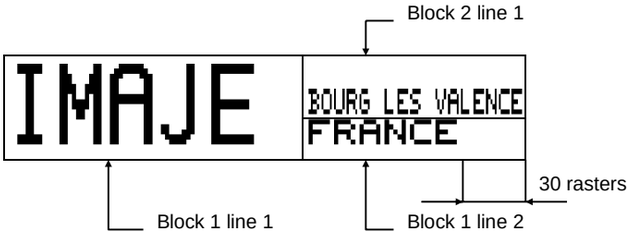


Sequence to be programmed:

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 13h	19 bytes	
Number of jet	01h	Jet no 1	
Start of line delimiter	0Ah	Line 1	
Bolderization	02h	Bolderization 2	Block 1, line 1
Symbol generator	38h	SIN16119 (no 56)	
Text	IMAJE␣	6 ASCII characters	
Bolderization	01h	Bolderization 1	Block 2, line 1
Symbol generator	54h	SIN05116 (no 84)	
Text	FRANCE	6 ASCII characters	
End delimiter	0Dh	End of message	
Checksum	07h	Check byte	

1.2 Transmission of a two-line message

Without parameters, on jet 1, outside of library, with fonts 16 x 12 No. 56, 5 x 6 No. 83 and 5x6 No. 84.



ATTENTION **When a message contains two lines, the two lines must end at the same position in order to be printable in "reverse message "direction.**

Calculation of the number of balancing rasters for line 2:

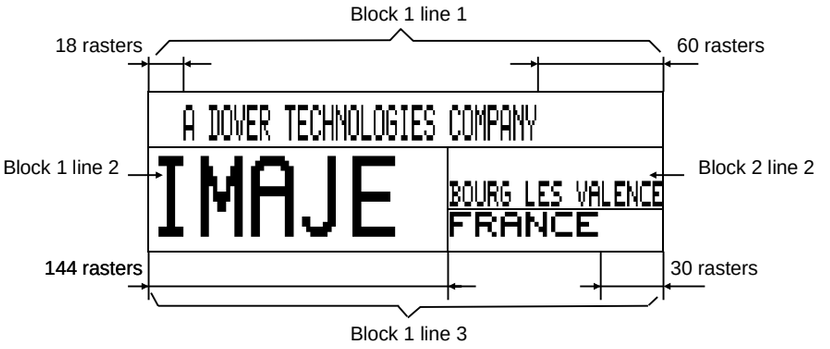
Block 2, line 1 = 17 characters x bolderization 1 x 6 rasters/character =	102
Block 1, line 2 = 6 characters x bolderization 2 x 6 rasters/character =	72
Balancing = Difference, i.e.	30 rasters

Sequence to be programmed:

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 2Ah	42 bytes	
Number of jet	01h	Jet no 1	
Start of line delimiter	0Ah	Line 1	
Bolderization	02h	Bolderization 2	Block 1, line 1
Symbol generator	38h	SIN16119 (no 56)	
Text	IMAJE␣	6 ASCII characters	
Bolderization	01h	Bolderization 1	Block 2, line 1
Symbol generator	53h	SIN05116 (no 83)	
Text	BOURG ...	17 ASCII characters	
Start of line delimiter	0Ah	Line 2	
Bolderization	02h	Bolderization 2	Block 1, line 2
Symbol generator	54h	SIN05116 (no 84)	
Text	FRANCE	6 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	1Eh	30 rasters	
Tab delimiter	1Eh	End tab	
End delimiter	0Dh	End of message	
Checksum	3Ah	Check byte	

1.3 Transmission of a three-line message

Without parameters, on jet 1, outside of library, with fonts 16 x 12 No. 56, 5 x 6 No. 83, 5x6 No. 84 and 7x6 No. 160.



ATTENTION	**When a message contains more than two lines, all the lines must be of the same length, i.e. have the same number of rasters, in order to be printable in "reverse message" direction.**

Calculation of the longest line (line 2):

Block 1, line 2 = 6 characters x bolderization 2 x 12 rasters/character = 144
Block 2, line 2 = 17 characters x bolderization 1 x 6 rasters/character = 102
Total line 2 = Block 1 + Block 2 = 246 rasters

Calculation of number of balancing rasters for line 1:

A DOVER ... COMPANY = 28 characters x bolderization 1 x 6 rasters/character = 168 rasters
Number of balancing rasters = 246 - 168 = 78 rasters
I.e.: 18 rasters in front of the text and 60 rasters after it.

Calculation of number of balancing rasters for line 3:

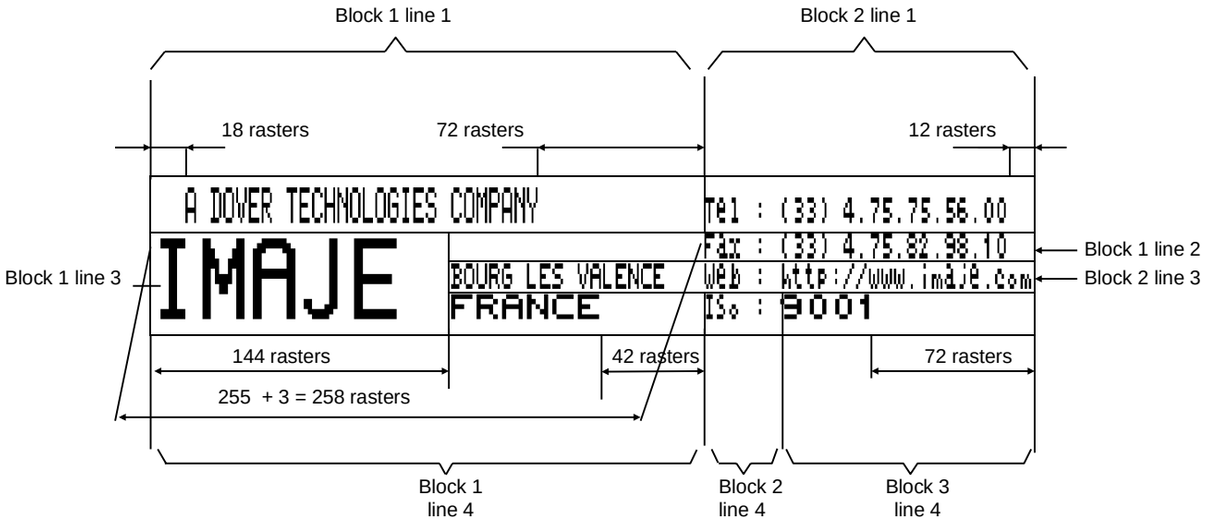
FRANCE = 6 characters x bolderization 2 x 6 rasters/character = 72 rasters
Space in front of "FRANCE" = block 1 of line 2, i.e. 144 rasters.
Number of rasters after "FRANCE" = 246 - (144 + 72) = 30 rasters

Sequence to be programmed:

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 52h	82 bytes	
Number of jet	01h	Jet no 1	
Start of line delimiter	0Ah	Line 1	
Bolderization	01h	Bolderization 1	
Symbol generator	A0h	SIN7H118 (no 160)	
Tab delimiter	1Eh	Start tab	
Number of rasters	12h	18 rasters	Block 1, line 1
Tab delimiter	1Eh	End tab	
Text	A... COMPANY	28 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	3Ch	60 rasters	
Tab delimiter	1Eh	End tab	
Start of line delimiter	0Ah	Line 2	
Bolderization	02h	Bolderization 2	
Symbol generator	38h	SIN16119 (no 56)	Block 1, line 2
Text	IMAJE␣	6 ASCII characters	
Bolderization	01h	Bolderization 1	
Symbol generator	53h	SIN05116 (no 83)	Block 2, line 2
Text	BOURG ...	17 ASCII characters	
Start of line delimiter	0Ah	Line 3	
Bolderization	02h	Bolderization 2	
Symbol generator	54h	SIN05116 (no 84)	
Tab delimiter	1Eh	Start tab	
Number of rasters	90h	144 rasters	
Tab delimiter	1Eh	End tab	
Text	FRANCE	6 ASCII characters	Block 1, line 3
Tab delimiter	1Eh	Start tab	
Number of rasters	1Eh	30 rasters	
Tab delimiter	1Eh	End tab	
End delimiter	0Dh	End of message	
Checksum	3Bh	Check byte	

1.4 Transmission of a four-line message

Without parameters, on jet 1, outside of library, with fonts 16 x 12 No. 56, 5 x 6 No. 83, 5x6 No. 84, 7x6 No. 160, 5x6 No. 166 and 5x6 No. 167.



ATTENTION	**When a message contains more than two lines, all the lines must be of the same length, i.e. have the same number of rasters, in order to be printable in "reverse message" direction.**

Example breakdown of message:

Line 1

Block 1:	- Space		18 rasters
	- Text: A DOVER TECHNOLOGIES COMPANY		168 rasters
	- Space		72 rasters
Block 2:	- Text: Tel: (33) 4.75.75.56.00		144 rasters
	- Balancing		12 rasters
		Total line 1	**414 rasters**

Line 2

Block 1:	- Space		255 rasters*
	- Space		3 rasters*
	- Text: Fax: (33) 4.75.82.98.10		144 rasters
	- Balancing		12 rasters
		Total line 2	**414 rasters**

* Since the maximum number of rasters is 255, the space required here (258 rasters) has been divided into two.

Line 3

Block 1: - Text: IMAJE ␣		144 rasters
Block 2: - Text: BOURG LES VALENCE ␣␣ Web ... com		270 rasters
	Total line 3	**414 rasters**

Line 4

Block 1 : - Space		144 rasters
- Text: FRANCE		72 rasters
- Space		42 rasters
Block 2 : - Text: Iso : ␣		36 rasters
Block 3 : - Text : 9001		48 rasters
- Balancing		72 rasters
	Total line 4	**414 rasters**

Sequence to be programmed:

Identifier	0Ah	Transmission of message contents outised of lib.	
Length	00h, C0h	192 bytes	
Number of jet	01h	Jet no 1	
Start of line delimiter	0Ah	Line 1	
Bolderization	01h	Bolderization 1	Block 1 line 1
Symbol generator	A0h	SIN7H118 (no 160)	
Tab delimiter	1Eh	Start tab	
Number of rasters	12h	18 rasters	
Tab delimiter	1Eh	End tab	
Text	A...COMPANY	28 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	48h	72 rasters	
Tab delimiter	1Eh	End tab	
Bolderization	01h	Bolderization 1	Block 2 line 1
Symbol generator	A6h	SIN5H116 (no 166)	
Text	Tel ...	24 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	0Ch	12 rasters	
Tab delimiter	1Eh	End tab	

Start of line delimiter	0Ah	Line 2	
Bolderization	01h	Bolderization 1	Block 1 line 2
Symbol generator	A7h	SIN5H116 (no 167)	
Tab delimiter	1Eh	Start tab	
Number of rasters	FFh	255 rasters	
Tab delimiter	1Eh	End tab	
Tab delimiter	1Eh	Start tab	
Number of rasters	03h	3 rasters	
Tab delimiter	1Eh	End tab	
Text	Fax ...	24 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	0Ch	12 rasters	
Tab delimiter	1Eh	End tab	
Start of line delimiter	0Ah	Line 3	
Bolderization	02h	Bolderization 2	Block 1 line 3
Symbol generator	38h	SIN16119 (no 56)	
Text	IMAJE ␣	6 ASCII characters	
Bolderization	01h	Bolderization 1	Block 2 line 3
Symbol generator	53h	SIN05116 (no 83)	
Text	BOUR ... com	45 ASCII characters	
Start of line delimiter	0Ah	Line 4	
Bolderization	02h	Bolderization 2	Block 1 line 4
Symbol generator	54h	SIN05116 (no 84)	
Tab delimiter	1Eh	Start tab	
Number of rasters	90h	144 rasters	
Tab delimiter	1Eh	End tab	
Text	FRANCE	6 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	2Ah	42 rasters	
Tab delimiter	1Eh	End tab	
Bolderization	01h	Bolderization 1	Block 2 line 4
Symbol generator	54h	SIN05116 (no 84)	
Text	Iso␣:␣	6 ASCII characters	
Bolderization	02h	Bolderization 2	Block 3 line 4
Symbol generator	54h	SIN05116 (no 84)	
Text	9001	4 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	48h	72 rasters	
Tab delimiter	1Eh	End tab	
End delimiter	0Dh	End of message	
Checksum	A5h	Check byte	

2 Commanding the printer by a programme in BASIC

2.1 Sending of a complete message of two lines (printer without library)

The message to send is:

IMAJE
JAIME 1000 Serie 4

The parameters are:

– Line 1	IMAJE in bolderization 1
– Line 2	JAIME 1000 Serie 4 in bolderization 2
– Message sense	normal
– Vertical sense	normal
– Horizontal sense	normal
– Printing speed	100 mm/s without tacho
– Command mode	object
– Forward margin	10 mm
– Return margin	10 mm
– Interval	10 mm
– Top filter	500 µs
– Counter	printing of leading zeros: yes incrementing: object reset of object top: no initial value: 123456789 final value: 987654321 step counter: 05 lot counter: 5
– Postdate interval	0

After opening the communication port the following character sequence is to be sent:

identifier
PRINT #0,CHR$(&h0C)+_

length
CHR$(&h00)+CHR$(&h44)+_

jet number
CHR$(&h01)+_

mode and sense (in binary)
CHR$(&b00000000)+_

printing speed
CHR$(&h00)+CHR$(&h64)+_

forward margin 10
CHR$(&h00)+CHR$(&h0A)+_

return margin 10
CHR$(&h00)+CHR$(&h0A)+_

interval 10
CHR$(&h00)+CHR$(&h0A)+_

object top filter 500ns
CHR$(&h01)+CHR$(&hF4)+_

counter parameters (in binary)
CHR$(&b10001001)+_

initial value
CHR$(&h31)+CHR$(&h32)+CHR$(&h33)+_
CHR$(&h34)+CHR$(&h35)+CHR$(&h36)+_
CHR$(&h37)+CHR$(&h38)+CHR$(&h39)+_

final value
CHR$(&h39)+CHR$(&h38)+CHR$(&h37)+_
CHR$(&h36)+CHR$(&h35)+CHR$(&h34)+_
CHR$(&h33)+CHR$(&h32)+CHR$(&h31)+_

step counter
CHR$(&h30)+CHR$(&h35)+_

lot counter
CHR$(&h00)+CHR$(&h00)+CHR$(&h05)+_

postdate interval
CHR$(&h00)+CHR$(&h00)+_

```
beginning line 1
CHR$(&h0A)+_

bolderization line 1
CHR$(&h01)+_

symbol generators line1
CHR$(&h34)+_

text line 1: IMAJE
CHR$(&h49)+CHR$(&h4D)+CHR$(&h41)+CHR$(&h4A)+CHR$(&h45)+_

end of the line 1
CHR$(&h0A)+_

bolderization line 2
CHR$(&h02)+_

symbol generators line2
CHR$(&h35)+_

text line 2: JAIME 1000 Serie 4
CHR$(&h4A)+CHR$(&h41)+CHR$(&h49)+CHR$(&h4D)+CHR$(&h45)+_
CHR$(&h20)+CHR$(&h31)+CHR$(&h30)+CHR$(&h30)+CHR$(&h30)+CHR$(&h20)+_
CHR$(&h53)+CHR$(&h65)+CHR$(&h72)+CHR$(&h69)+CHR$(&h65)+CHR$(&h20)+CHR$(&h34)+_

end of the text line 1 and line 2
CHR$(&h0D)+_

control byte
CHR$(&h03)
```

After sending this succession of characters it is necessary to process the ACK or NACK reply given by the printer.

2.2 Request for jet 1 state

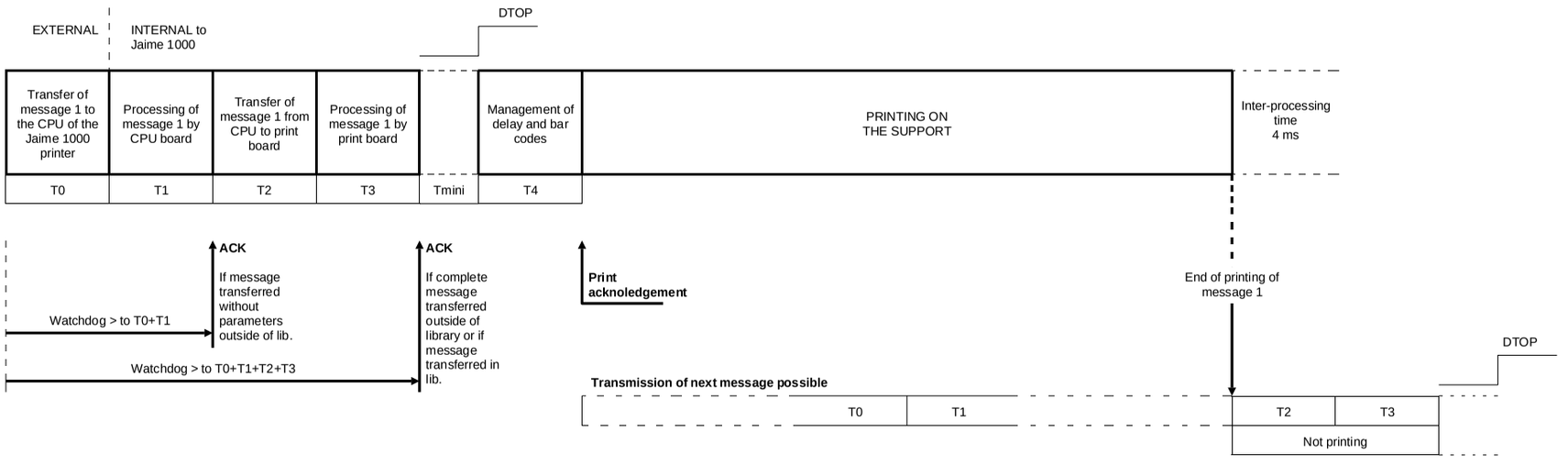
After opening the communication port the following character sequence is to be sent:

PRINT#0,CHR$(&h32)+CHR$(&h00)+CHR$(&h01)+CHR$(&h01)+CHR$(&h32)

The printer replies as follows:

- On 5 bytes: ACK, Identifier, Length, Jet state, Check.
- On 1 byte: NACK.

REMINDER	**The value of the 4th byte (jet state) represents the state of the jet..** **00h = jet stopped** **01h = jet in start phase** **02h = jet refreshing** **03h = jet in stability check** **04 h = jet in solvent input** **05h = jet in nozzle clearing** **06h = adjustment** **07h = jet in operation** **It is advisable to process the reply correctly.**



T0 = $\frac{\text{Nbr of bytes transmitted x Nbr of bits per byte transmitted (10 or 11)}}{\text{Transmission speed}}$ in seconds

T1 = 0.0001 x Nbr of bytes transmitted in seconds.

If the message is complete:

T 2 = (46 x 0.0001) + (0.0001 x Nbr of bytes transmitted) in seconds

message parameters

The number of bytes transmitted between the PRT board and CPU can increase if the message contains attributes (expansion, large characters...).

If the message is not complete: (no parameters sent)

T2 = 0.0001 x Nbr of bytes transmitted in seconds.

T3 = (0.0001 x Nbr of bytes transmitted) in seconds.
The number of bytes transmitted between the PRT board and CPU can increase if the message contains attributes (expansion, large characters...).

T 4 = Delay: from 0.5 ms to 2 ms if the PRT board receives the hour at this moment.
Bar codes: up 9 ms if code 39 with 31 characters and the check byte are present.

Watchdog:

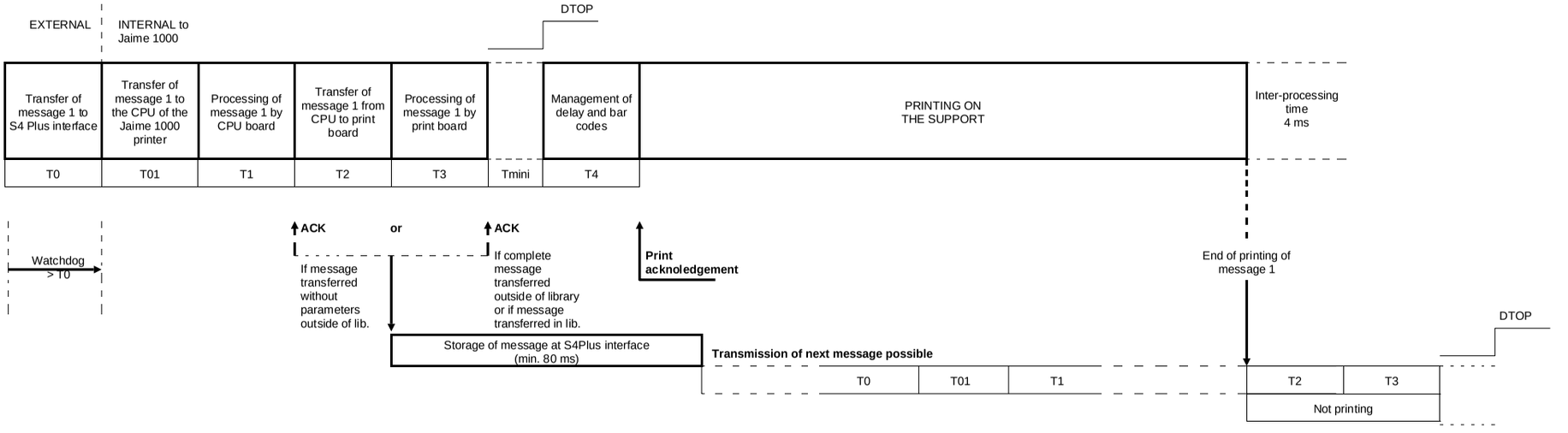
- Greater than T0+T1 if message transferred without parameters outside of lib.
- Greater than T0+T1+T2+T3 if complete message transferred outside of library or if message transferred in lib.

Sending of the printing acknowledgement:

- 0.5 ms if the V24 link is free.
- 10 ms if the V24 link is busy.

Transmission of next message:

- It is possible to transfer a new message as soon as the acknowledgement of receipt has been received by the calculator.
- It is not possible to transfer a message from the CPU board to the print board (T2) until after the previous message has been printed.



$$T0 = \frac{\text{Nbr of bytes transmitted x Nbr of bits per byte transmitted (10 or 11)}}{\text{Transmission speed}} \quad \text{in seconds}$$

$$T01 = \frac{\text{Nbr of bytes transmitted x 10}}{38400}$$

T1 = 0.0001 x Nbr of bytes transmitted in seconds.

If the message is complete:

T 2 = (46 x 0.0001) + (0.0001 x Nbr of bytes transmitted) in seconds

message parameters

The number of bytes transmitted between the PRT board and CPU can increase if the message contains attributes (expansion, large characters...).

If the message is not complete: (no parameters sent)

T2 = 0.0001 x Nbr of bytes transmitted in seconds.

T3 = (0.0001 x Nbr of bytes transmitted) in seconds.
The number of bytes transmitted between the PRT board and CPU can increase if the message contains attributes (expansion, large characters...).

T 4 = Delay: from 0.5 ms to 2 ms if the PRT board receives the hour at this moment.
Bar codes: up 9 ms if code 39 with 31 characters and the check byte are present.

Watchdog:

- Greater than T0.

Sending of the printing acknowledgement:

- 0.5 ms if the V24 link is free.
- 10 ms if the V24 link is busy.

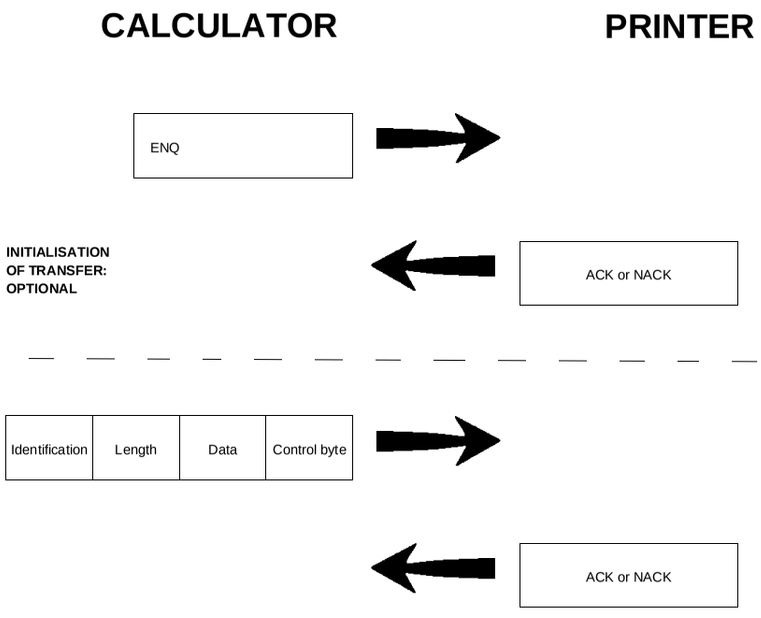
Storage of message at S4 Plus interface:

- Storage starts after the ACK and lasts for at least 80 ms.

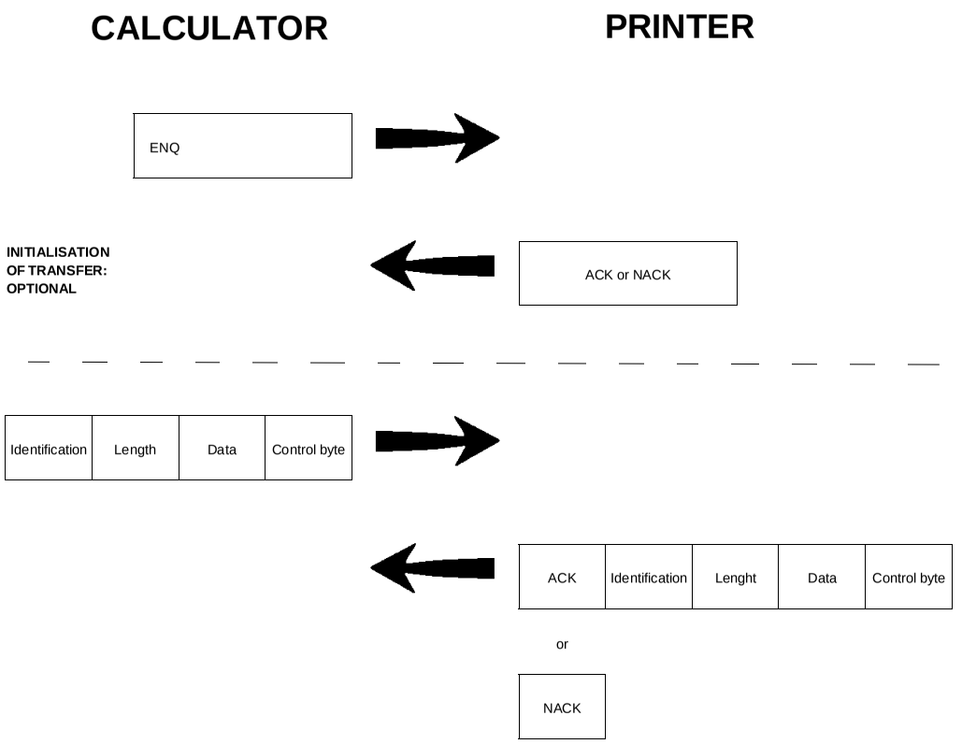
Transmission of next message:

- It is possible to transfer a new message when storage of the previous message is terminated.
- It is not possible to transfer a message from the CPU board to the print board (T2) until after the previous message has been printed.

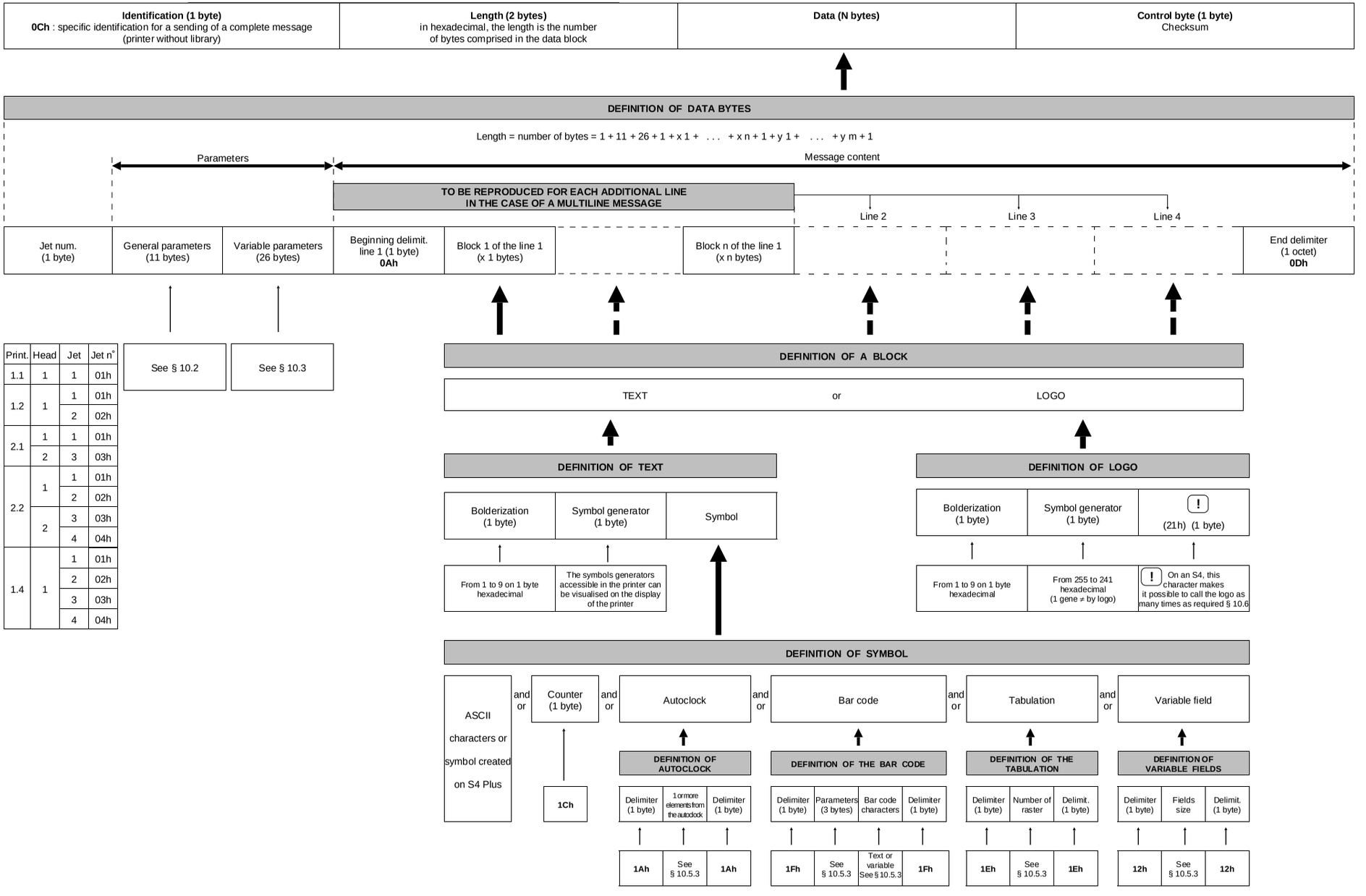
• Data sending from the computer to the printer



• Data request from the computer to the printer



Identification (1 byte)	Length (2 octets)	Data (0 to n bytes)	Control (1 byte)
Specific for each See table pages 4-2 to 4-4	The length is the number of bytes comprised between the length and the checksum byte.	Zero byte in case of request from the calculator of the printer. 1 byte specifying th jet number in case of a request concerning a jet. n bytes without specifying the jet number in case of a sending concerning the printer in general. n bytes following one byte specifying the jet number in case of a sending concerning a jet.	Checksum. This represent an "OR" exclusive of all preceding bytes (identification, length and data bytes).


Identification (1 byte)
0Ch : specific identification for a sending of a complete message (printer without library)
Length (2 bytes)
in hexadecimal, the length is the number of bytes comprised in the data block
Data (N bytes)
Control byte (1 byte)
Checksum
DEFINITION OF DATA BYTES
Length = number of bytes = 1 + 11 + 26 + 1 + x 1 + . . . + x n + 1 + y 1 + . . . + y m + 1
Parameters
Message content
TO BE REPRODUCED FOR EACH ADDITIONAL LINE IN THE CASE OF A MULTILINE MESSAGE
Line 2
Line 3
Line 4
Jet num. (1 byte)
General parameters (11 bytes)
Variable parameters (26 bytes)
Beginning delimit. line 1 (1 byte) 0Ah
Block 1 of the line 1 (x 1 bytes)
Block n of the line 1 (x n bytes)
End delimiter (1 octet) 0Dh
Print. Head Jet Jet n°
1.1 1 1 01h
1.2 1 1 01h
1.2 1 2 02h
2.1 1 1 01h
2.1 2 3 03h
2.2 1 1 01h
2.2 1 2 02h
2.2 2 3 03h
2.2 2 4 04h
1.4 1 1 01h
1.4 1 2 02h
1.4 1 3 03h
1.4 1 4 04h
See § 10.2
See § 10.3
DEFINITION OF A BLOCK
TEXT
or
LOGO
DEFINITION OF TEXT
Bolderization (1 byte)
Symbol generator (1 byte)
Symbol
From 1 to 9 on 1 byte hexadecimal
The symbols generators accessible in the printer can be visualised on the display of the printer
DEFINITION OF LOGO
Bolderization (1 byte)
Symbol generator (1 byte)
! (21h) (1 byte)
From 1 to 9 on 1 byte hexadecimal
From 255 to 241 hexadecimal (1 gene ≠ by logo)
! On an S4, this character makes it possible to call the logo as many times as required § 10.6
DEFINITION OF SYMBOL
ASCII characters or symbol created on S4 Plus
and or
Counter (1 byte)
1Ch
Autoclock
DEFINITION OF AUTOCLOCK
Delimiter (1 byte)
1 or more elements from the autoclock
Delimiter (1 byte)
1Ah
See § 10.5.3
1Ah
Bar code
DEFINITION OF THE BAR CODE
Delimiter (1 byte)
Parameters (3 bytes)
Bar code characters
Delimiter (1 byte)
1Fh
See § 10.5.3
Text or variable See § 10.5.3
1Fh
Tabulation
DEFINITION OF THE TABULATION
Delimiter (1 byte)
Number of raster
Delimit. (1 byte)
1Eh
See § 10.5.3
1Eh
Variable field
DEFINITION OF VARIABLE FIELDS
Delimiter (1 byte)
Fields size
Delimit. (1 byte)
12h
See § 10.5.3
12h

PARALLEL LINK - PRESENTATION (6 pages)

Contents

1 Introduction

The Parallel interface allows rapid selection and printing of a message stored in the library.

The options "Message selection" and "Message library" are necessary for using this mode of operation.

2 Characteristics of the Parallel link

2-1 Signals transmitted by the Parallel link

8 data input signals (D0 to D7) which enable the selection of the number of the message to be printed.
1 input singal, called "DTOP", which enables the validation of the active message number in the memory and starting-up of printing.
1 output signal, called "BUSY", which indicates that printing has started.

NOTE: **The input/output signals being photocoupled on the Industrial Interface card each require an electrical reference wire (see Chapter 3 of present Section).**

2-2 Characteristics of transmitted levels

The active level (logic 1) is comprised between 9 and 24 volts D.C.
The inactive level (logic 0) is comprised between 0 and 2 volts D.C. (see Figure 1).
The current admissible on input is comprised between 9mA and 25mA.
The input frequency must not exceed 10 Khz.

Figure 1 : Authorised logic level

1 ––––––––– Active level (logic 1)
2 ––––––––– Anactive level (logic 0)

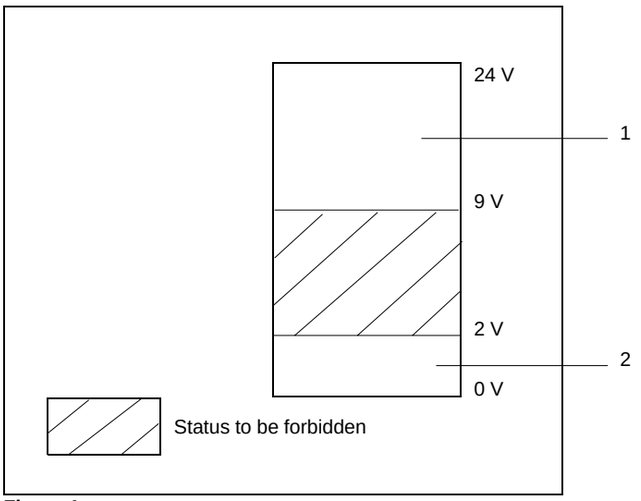


Figure 1

3 Connection diagram

To have access to the Industrial Interface card, unscrew the two fixing screws of its compartment housing at the rear of the printer.

Pass the connecting cable through one of the grommets and fix the wires to the corresponding terminals.

B2/IMP1 and B3/IMP2 terminal block

1	GND	0VA	Analog 0V
2	+ 24 T	+ 24 VE	+ 24 V supply not insulated galvanization.
3	CTP	DTOP –	Terminals for connection of the object detection cell.
4	TP	DTOP +	
5	CVI	VALIMP –	Inhibition of the object detection signal.
6	VI	VALIMP +	
7	CTH	TACHY –	Terminals for connection of the tachometric generator.
8	TH	TACHY +	
9	TH +	TACHY +	Terminals for connection of a differential tacho generator.
10	TH –	TACHY -	
11	C BU	BUSY –	Output for printing start-up signal.
12	BU	BUSY +	
13	C D	DATA (–)	Commun DATA (–)
14	D0	DATA (+) 8 bits	Inputs for Parallel interface printing used in "Message selection".
15	D1		
16	D2		
17	D3		
18	D4		
19	D5		
20	D6		
21	D7		
22	+ 24 T	+ 24 VE	+ 24 V supply not insulated by galvanization.

The input/output of the Parallel interface are photocoupled.

According to the voltages applied to the inputs, it is necessary to adjust the value of the resistance R (Figure 1) to obtain the nominal input current IF.

The emitted signal must be positive in relation with its earth.

Example :

TP	4	+ signal coming from the detection cell
CTP	3	– signal coming from the detection cell

Figure 1 : Diagram of a photocoupled input

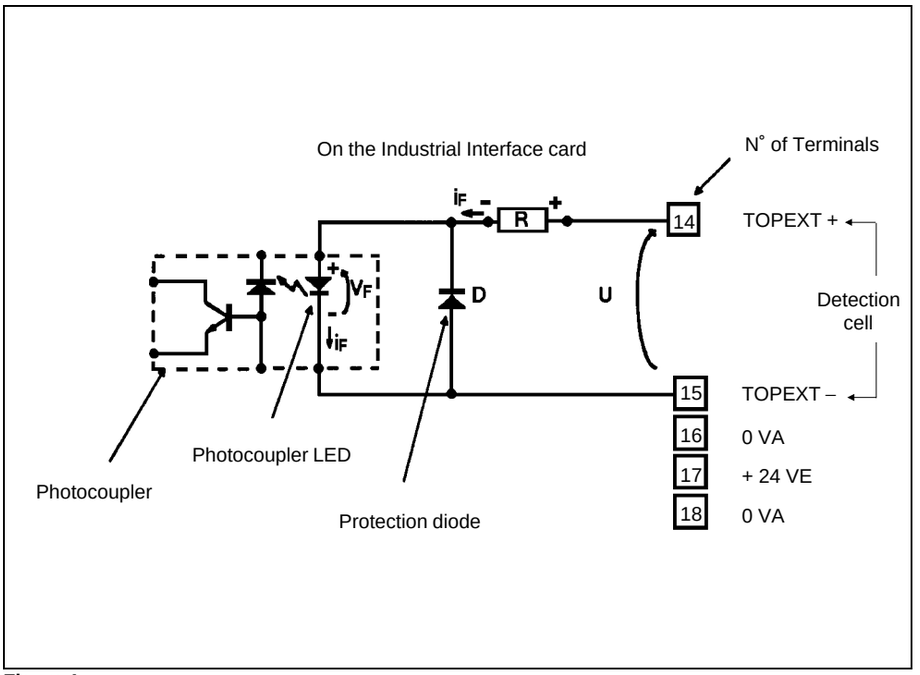


Figure 1

Connection of a Parallel interface to a SIGEA head mouvement

Terminal block for SIGEA head mouvement	Terminal block for Industrial Interface card	
17	3	CTP
6	4	TP
3	11	C BU
25	12	BU
	13	CD
18	14	D0
19	15	D1
20	16	D2
21	17	D3
22	18	D4
23	19	D5
24	20	D6
26	21	D7

PARALLEL LINK - SELECTION OF MESSAGES (11 pages)

Contents

1 Selection of a message from the library

The signals D0 to D7 (which represent one byte of 8 bits) indicate the number of the active message to be printed and its type of coding.

The number of addressable messages in the library is variable (from 1 to 79 in decimal format, from 1 to 4F in hexadecimal format). It depends on the value displayed in the "SHIFT MENU" function in the case of S4 or in the menu Production, Message, Library in the case of S4 plus.

Validation and printing of the new message are performed by sending the DTOP signal.

Possible types of encoding for the message number: there are 3 possibilities.

1.1 Encoding of message number in BCD format

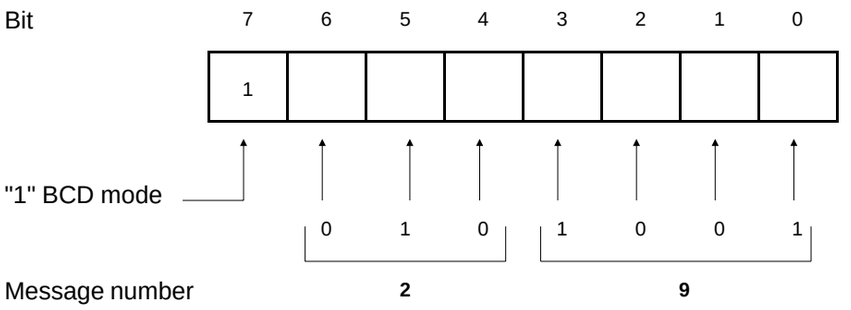
The BCD mode (Binary Coded Decimal, base 10) uses 4 bits, whose value is comprised between 0 and 9 (from 0000 to 1001 in binary code).

The units in the message number are represented by the bits 0, 1, 2 and 3.

The tens in the message number (from 0 to 7) are represented by the bits 4, 5 and 6.

Bit 7 must **obligatorily** be positioned at 1.

Example: request of message number 29.



"1" = active level
"0" = inactive level

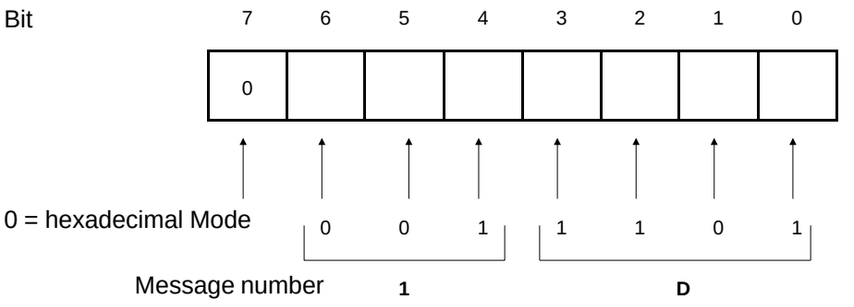
1.2 Encoding of message number in hexadecimal mode

The hexadecimal mode (base 16) is coded on 4 bits, whose value is comprises between 0 and F (0000 to 1111 in binary code).

Bits 0 to 6 used for the message number.

Bit 7 must **obligatorily** be positionned at 0.

Example: request for message number 29 (1D in hexadecimal).



"1" = active level
"0" = inactive level

1.3 Option: reversed message direction

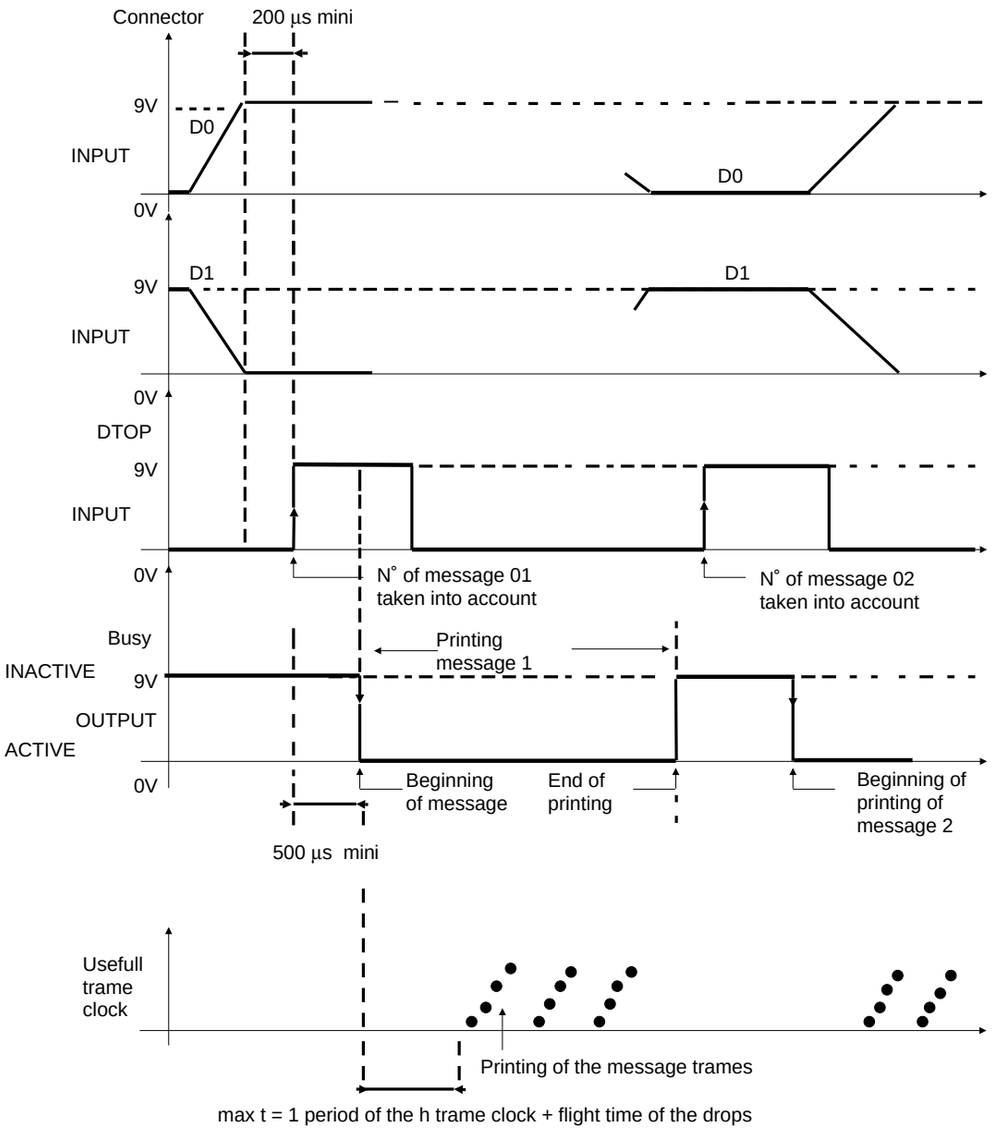
If the printer is equipped with the "reverse message direction" option, the message number must be encoded in hexadecimal format.

Bit 7 is used to reverse the direction of message printing.
0 = normal direction / 1= reverse message direction

2 Input signals diagram

- Selection of message 1: number 1
- Selection of message 2: number 2

The data bits 2 to 7 are at 0.



The minimum time between the stable signals D0 to D7 and the DTOP is 200 µs.

The DTOP signal may drop out as soon as the BUSY signal is active.

The minimum activation time of the BUSY signal after a DTOP is 500 µs.

The BUSY signal remains active during the full printing time of the message. It becomes inactive again as soon as the printer is available for a new message.

3 Master jet, master message

As a general rule, the "master jet" is jet number 1 of a print head.

Master messages are associated with master jets and their numbers advance by 1 in 1, 2 in 2 or 4 in 4, according to the printer configurations.

In practice, when the message is composed on the printer keyboard the master messages are those for which one can access to "message parameters".

4 General operation of the parallel interface

To print a message from the library, it is necessary:

- To present the message number to printer on the Parallel Interface (D0-D7) of the head concerned.
- To activate the DTOP signal, which:
  - memorizes the message number,
  - activates the print start-up.

The BUSY signal is activated at the start of printing. It becomes inactive at the end of the printing cycle.

A printing cycle consists of:

- a print of the message,
- phase recognition.

When the Parallel Interface is used in AUTO mode, the BUSY operates as described above for each message printed.
It can therefore be used to alter the message itself in this start mode.

If the printer receives a DTOP without the external inputs being activated, the last selected message is to be printed.

If the printer receives an invalid message number the last selected message is to be printed.
A message number should be from 1 to the end of the library.
Any message beyond the size of the library is invalid.

5 Restriction of the parallel interface operation

The option "Non double printing" is not available with the option "Message selection".

The use of postdate 2 is incompatible with the use of a parallel interface option.

6 Usage according to printer configurations

6.1 Printer 1.1 (1 single-jet print head)

- **Branching:**

  Head 1 ------> D0-1 to D7-1, Dtop 1, BUSY 1

- **Usage:**

  All the messages are"masters" and can be allocated to the single jet.

CAUTION **The message number must not exceed the size of the library.**

6.2 Printer 1.2 (1 twin-jet print head)

- **Branching:**

  Head 1 ------> D0-1 to D7-1, Dtop 1, BUSY 1

- **Usage:**

  Only odd numbered messages are "masters".
  The message number to be presented to the parallel Interface must be that of Jet 1.
  Jet 2 automatically and necessarily assumes the following message number.

  Example:
  Jet 1, "master" message Nr n (odd)
  Jet 2, message (n+1)

CAUTION **(n+1) must not exceed the size of the library.**

- **Library storage:**

  Message 1 Jet 1
  Message 2 Jet 2
  Message 3 Jet 1
  Message 4 Jet 2
  Message 5 Jet 1
  .
  .
  .
  Message 77 Jet 1
  Message 78 Jet 2

6.3 Printer 2.1 (2 single-jet heads)

- **Branching:**

  Head 1 ------> D0-1 to D7-1, Dtop 1, BUSY 1
  Head 2 ------> D0-2 to D7-2, Dtop 2, BUSY 2

- **Usage:**

  All the messages are "masters" and can be used indifferently on both heads provided they have the same character generators.

  Otherwise:

  Message 1 head 1
  Message 2 head 2
  Message 3 head 1
  Message 4 head 2
  Message 5 head 1
  .
  .
  .
  Message 79 head 1

6.4 Printer 2.2 (2 twin-jet heads)

- **Branching:**

  Head 1 ------> D0-1 to D7-1, Dtop 1, BUSY 1
  Head 2 ------> D0-2 to D7-2, Dtop 2, BUSY 2

- **Usage:**

  Only the odd numbered messages are masters. The message number to be presented on the parallel Interface must be that of Jet 1 of the corresponding print head.
  Jet 2 of the same head then automatically and necessarily assumes the following message number.

  Example:
  Jet 1, "master" message Nr n (odd)
  Jet 2, message (n+1)

CAUTION **(n+1) must not exceed the size of the library.**

- **Library storage:**

  Message 1 head 1 jet 1 (master message)
  Message 2 head 1 jet 2
  Message 3 head 2 jet 1 (master message)
  Message 4 head 2 jet 2
  Message 5 head 1 jet 1 (master message)

6.5 Printer 1.4 (1 head with 4 jets)

- **Branching:**

  D0-1 to D7-1, Dtop 1 and BUSY 1
  D0-2 to D7-2, Dtop 2 should be branched parallel with D0-1 to D0-7 and Dtop 1.

- **Usage:**

  The message number to be presented on the parallel Interface for the head is that of Jet 1 of the corresponding head.
  Jet 2 automatically assumes the message number on the basis of that of jet 1.
  Jet 3 automatically assumes the message number on the basis of that of jet 2.
  Jet 4 automatically assumes the message number on the basis of that of jet 3.

  Example:
  Jet 1 message n (master message)
  Jet 2 message n + 1
  Jet 3 message n + 2
  Jet 4 message n + 3

CAUTION **(n + 3) must not exceed the size of the library.**

BUSY 1 is activated if the 4 jets are printing.

- **Library storage:**

Message 1	jet 1 (master message)
Message 2	jet 2
Message 3	jet 3
Message 4	jet 4
Message 5	jet 1 (master message)
.	
.	
.	
Message 73	jet 1 (master message)
Message 74	jet 2
Message 75	jet 3
Message 76	jet 4

7 Summary charts

7.1 General

Messages are:

- created by the operator Interface (machine keyboard),
- selected by the parallel Interface.

	Printer	1.1	1.2	2.1		2.2		1.4
	Head	1	1	1	2	1	2	1
	Master jet	1	1	1	3	1	3	1
Master message	n	01 02 03...79	01 03 05...77	01 03 05...79	02 04 06...78	01 05 09...73	03 07 11...75	01 05 09...73
Automa-tically associated messages	n + 1		02 04 06...78			02 06 10...74	04 08 12...76	02 06 10...74
	n + 2							03 07 11...75
	n + 3							04 08 12...76

7.2 Special case

Message are:

- created by the series Interface (V 24 connection)
- selected by the parallel Interface

Printer	**1.1**	**1.2**	**2.1**		**2.2**		**1.4**
Master message	x	x	x	x	x	x	x
Value of x	$1 \le x \le 79$	$1 \le x \le 78$	$1 \le x \le 79$		$1 \le x \le 78$		$1 \le x \le 76$
Message Nr on jet 2		x + 1			x + 1	x + 1	x + 1
Message Nr on jet 3							x + 2
Message Nr on jet 4							x + 3