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**AXF**

**AXF programming manual**



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**CHAPTER 1 : GENERAL DESCRIPTION****General**

This programme is developed in order to enable any user to connect their AXIOME OMR reader to (almost) any computer. After power-on, it is possible to send the reader a list of parameters to suit your computer interface. The parameter file is described in this document.

**How to use it ?**

When turning the power on, the reader is ready to work with the parameters used in the last session. The parameters stays in memory until you decide to change them, or until the battery is defect.

**Changing the parameters**

When turning the power on, wait for the "M26B" or "Manager 985" message and push the button on the reader until the message "PARA" or "PARAMETER PLEASE" is displayed. This message is automatically displayed if the parameters are corrupted. If you don't push the button, the reader will use the parameter from the last session as far as they are uncorrupted. ( a memory check will be made at every power on and new parameters will be requested if the data are false).

Loading the parameters will be always done at 9600 Baud No-parity, 8 bits, 1 stop.

**After loading the parameters, the baudrate ,the parity, the length, and the stop bits will be changed according to the value specified in the parameter file downloaded.**

## File Format

The @AXF string is used to indicate the start of the parameter file. Any other comment without any restriction may be written on the file before this string.

---

After @AXF, the order of the parameters, and the number of data is very important and must not be changed. After @AXF, comments are allowed IF they don't use characters between 30H and 47H . That mean that comment written in lowercase characters are allowed.

---

The string @MASK 48 TRACKS is used as separator and to indicates the format for the mask. The format may be either 00 (no mask), 12, 40 or 48 tracks after the last bit of the mask, the string @END must follow without any other character

## Normal start up

### Transferring the " AXF Parameters "

The AXF parameter software loaded with firmware (refer to Transferring "Firmware" from user manual), runs with parameters that were sent as a file to the reader. They stay in memory until the next transfer of a new parameter file.

When first installing an reader using AXF, the parameter file must be transferred. A simple COPY allows you to send this file to the reader.

### Transferring the DEFAULT.AXF parameter file to the reader.

Switch the reader on ( switch ON ) and press the START-button as soon as the reader displays "MAN xVx". Hold the button pressed down until the reader displays "PARAM". The reader is now ready to receive new parameters.

**Communication :**

The transfer will be done at 9600 bauds, 8 data, no parity and 1 stop bit.

---

**Warning !!!** This manipulation will delete the old AXF parameters in the reader's memory.

---

Insert the *axm 930, 990, 995* disk or the *OMR Reader utilities* disk in Drive A or B of your PC.

To copy the parameter file (DEFAULT.AXF e.g.) type :

```
A: Enter ↵ or B: Enter ↵  
MODE COM1: 9600,N,8,1  
COPY DEFAULT.AXF COM1 Enter ↵
```

If the transfer to the reader has been successfully accomplished, the message "CDE Sx" will be displayed.





**CHAPTER 2 : The communication parameters**

The communication parameter part allows you to adapt many communication parameters to your needs.

The @AXF string is used to indicate the start of the parameter part.

After @AXF, the order of the parameters, and the number of data is very important and must not be changed.

In this part, characters between 30H and 45H are not allowed. That means that comments written in lowercase characters are allowed.

**Description of communication parameters****Start of document characters**

Up to 3 characters may be defined to be sent before each document. The fourth character (FF Hex) has not to be modified.

AXF parameter example :

start of document characters	<b>01 FF FF FF</b>	= <i>SOH</i>
------------------------------	--------------------	--------------

**Start of record characters**

Up to 3 characters may be defined to be sent before each record. The fourth character (FF Hex) has not to be modified.

AXF parameter example :

start of record characters	<b>02 FF FF FF</b>	= <i>STX</i>
----------------------------	--------------------	--------------

**End of record characters**

Up to 3 characters may be defined to be sent after each record. The fourth character (FF Hex) has not to be modified.

AXF parameter example :

end of record characters	<b>0D 0A 03 FF</b>	= <i>CR LF ETX</i>
--------------------------	--------------------	--------------------

**End of document characters**

Up to 3 characters may be defined to be sent after each document. The fourth character (FF Hex) have not to be modified.

AXF parameter example :

end of document characters	<b>04 FF FF FF</b>	= <i>EOT</i>
----------------------------	--------------------	--------------

**Start of error message**

Up to 3 characters may be defined to be sent before each error message. The fourth character (FF Hex) have not to be modified.

AXF parameter example :

start of error message	<b>15 FF FF FF</b>	= <i>NAK</i>
------------------------	--------------------	--------------

**End of error message**

Up to 3 characters may be defined to be sent after each error message. The fourth character (FF Hex) have not to be modified.

AXF parameter example :

end of error message	<b>0D 0A 03 FF</b>	= <i>CR LF ETX</i>
----------------------	--------------------	--------------------

**Fill character**

If the record has a defined length, the end of the record may have to be filled with the character defined here.

AXF parameter example :

fill character	<b>2E</b>	= <i>"." character</i>
----------------	-----------	------------------------

### Quantity of synch characters

This function allow to define a quantity X of characters Y (see 2.1.9) at the beginning of the record. These characters are counted by the record length counter.

AXF parameter example :

qty of synch characters	<b>0E</b>	= 14 characters
-------------------------	-----------	-----------------

### Synch characters

The ASCII value of the chosen character.

AXF parameter example :

synch character	<b>2D</b>	= "." character
-----------------	-----------	-----------------

### Record length

The length of the record may be variable (in this case lsb Hex 00 and msb Hex 00) or fixed. The record length has to be coded in binary.

If the value is different to 0, each record will be truncated at this value and the last record will be filled if necessary. This record value could be variable between lsb 00, msb 00 and lsb E0, msb 2E ( 0 to 12000 decimal)

AXF parameter example :

record length lsb hex	<b>28</b>	= 40 decimal
record length msb hex	<b>00</b>	= 00 decimal

### Baud rate

The baud rate may be chosen as follow :

1 = 1200 , 2 = 2400 , 3 = 4800 , 4 = 9600 , 5 = 19200 , 6 = 38400 bds

AXF parameter example :

baud rate	<b>04</b>	= 9600 bauds
-----------	-----------	--------------

## Uart

The UART mode may be selected with the next 4 bytes as follow :

word length (data bits)	02= 7 bits,	03 = 8 bits
parity enable	00 = no parity,	01 = parity on
parity	00 = odd,	01 = even
stops bits	01 = 1 stop	03 = 2 stops

AXF parameter example :

word length	<b>03</b>
parity enable	<b>00</b>
parity even	<b>01</b>
stops bits	<b>01</b>

In this example, the UART mode is : 8 bits, no parity, even parity, 1 stop bit

## Send number of marks read

The reader can compute the quantity of reading marks it finds on the document. The read send this value as a 4 characters decimal.

00 = not sent      01 = sent

AXF parameter example :

send number of marks read	<b>00</b>	= <i>not sent</i>
---------------------------	-----------	-------------------

## Send number of clocks read

The reader can also send the quantity of clock marks (or timing marks or lines) it read. The reader send this value as 3 characters decimal.

00 = not sent clock      01 = sent clock

AXF parameter example :

send number of clocks read	<b>00</b>	= <i>not sent clock</i>
----------------------------	-----------	-------------------------

### Good sound number

This option gives you the mean to produce a sound each time a document has been selected into the "good" hopper.

- 00 = no sound
- 01 = very short medium
- 02 = short medium
- 03 = normal medium
- 04 = (not active)
- 05 = alarm
- 06 = modulated sound

AXF parameter example :

bip number as ok	<b>00</b>	= <i>no sound</i>
------------------	-----------	-------------------

### Error sound number

This option produces a sound after a document has been "rejected", same values as above (see good sound number)

AXF parameter example :

bip number as ko	<b>05</b>	= <i>alarm</i>
------------------	-----------	----------------

### Send errors

This option will switch on or off, the sending of error messages on the serial output, when errors occurs.

- 00 does not send    01 = send errors

AXF parameter example :

send error messages	<b>01</b>	= <i>send errors</i>
---------------------	-----------	----------------------

### Wait for echo

If 01 is selected for this option, after each character sent to the host, the reader will wait until it becomes the same character back.

00 = no wait      01 = wait for echo

AXF parameter example :

wait for echo	<b>00</b>	= no wait
---------------	-----------	-----------

### Delay before sending data

You may define how many 50 milliseconds (0 to FF) the reader must wait before sending the first data of a document.

AXF parameter example :

delay before sending data	<b>0A</b>	= 10 step of 50 milliseconds
---------------------------	-----------	------------------------------

### Delay after each character

You define here how many milliseconds (0 to FF) the reader must wait after sending each character

AXF parameter example :

delay after each character	<b>0C</b>	= 12 milliseconds
----------------------------	-----------	-------------------

### Delay after each record

You define here how many milliseconds (0 to FF) the reader must wait after each record.

AXF parameter example :

delay after each record	<b>1F</b>	= 31 milliseconds
-------------------------	-----------	-------------------

### Repeat character

The character defined here (ASCII) is need to transmit again, the contents of the last document.

AXF parameter example :

character to repeat the document	<b>52</b>	= R character
----------------------------------	-----------	---------------

### Program number

This parameter let choose the output format you wish to use.

- 01 = every marked mark will generate its co-ordinates as 4 characters.
- 02 = each marked line will be transmitted in Hex format.
- 03 = each line will be transmitted in hex format
- 04 = all the documents is transmitted in image format
- 05 = only the marked lines will be transmitted in image mode.

Special binary output format only for axm 990 / 995.

- 06 = each marked line will be transmitted in a special binary format.
- 07 = only the marked lines will be transmitted in a special binary format.

The image of the document will be transmitted in binary format with 8 read cells coded in each byte, that means each byte can take a value from 00 to FF and it is no more possible to use special character like CR as terminator. To get round this annoyance we suggest to use the first byte of each block as a flag and the number of expected bytes following this flag can be found by the type of flag.

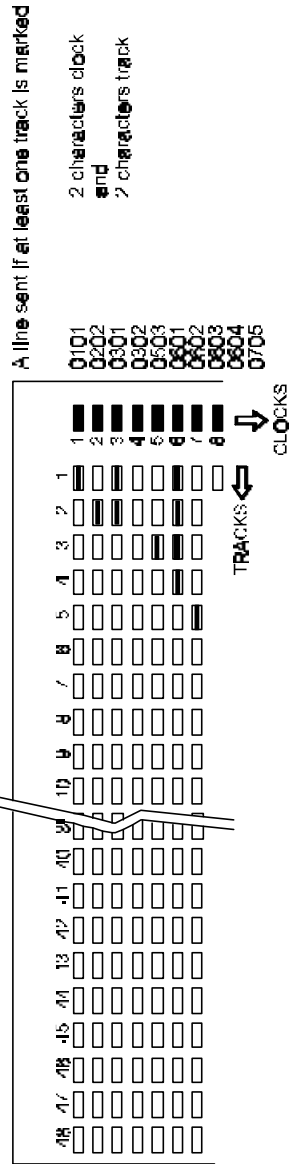
- Flag byte :
- 01...78 = clock number (binary hex value, max 120 clocks)
  - F1 = end of side 1 (binary hex value)
  - F2 = end of side 2 (binary hex value)
  - F3 = external data like bar-code (binary hex value)
  - F4 = error message (binary hex value)
  - F9 = end of document (binary hex value)

AXF parameter example :

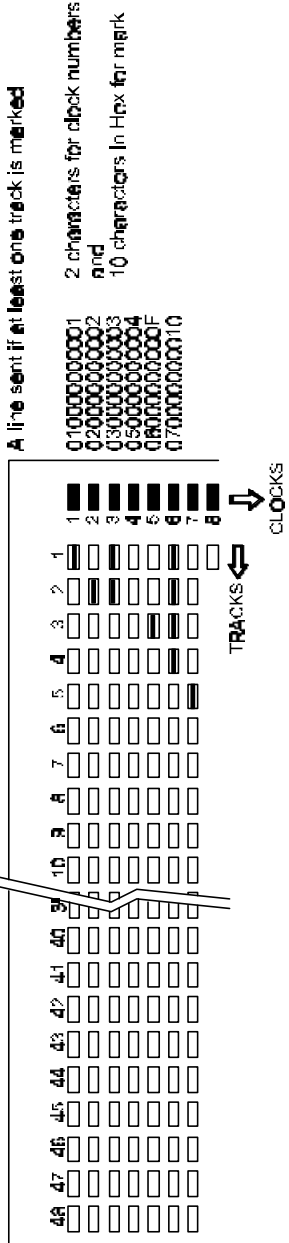
program number	<b>01</b> = co-ordinates as 4 characters
----------------	--



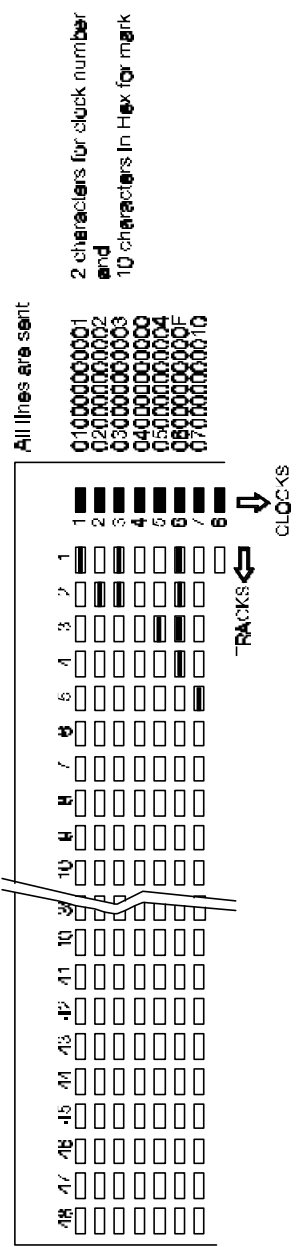
**DATA read example with program number 01:**



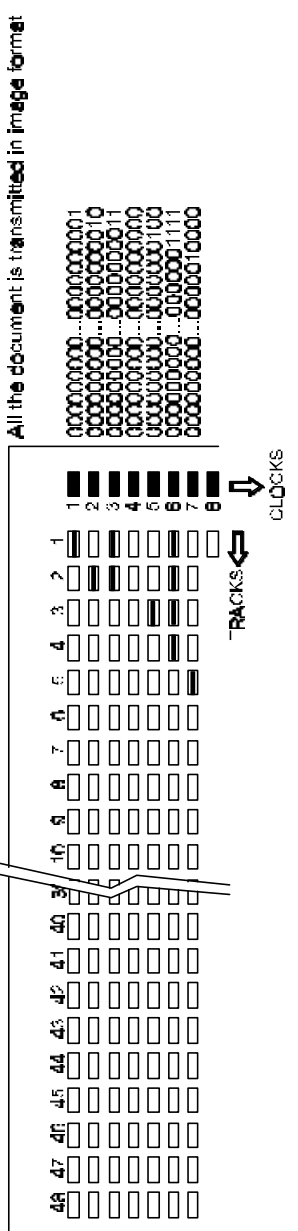
**DATA read example with program number 02:**



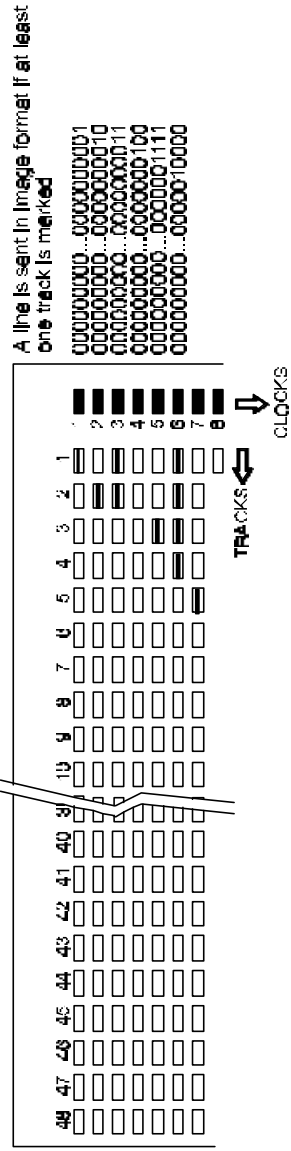
**DATA read example with program number 03:**



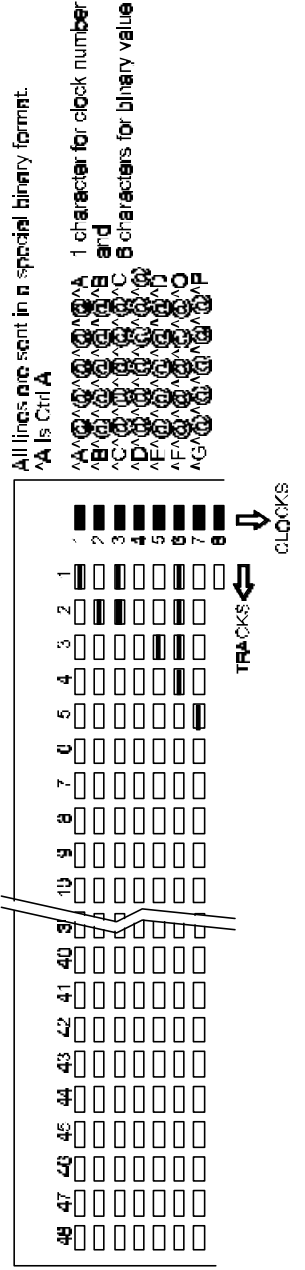
**DATA read example with program number 04:**



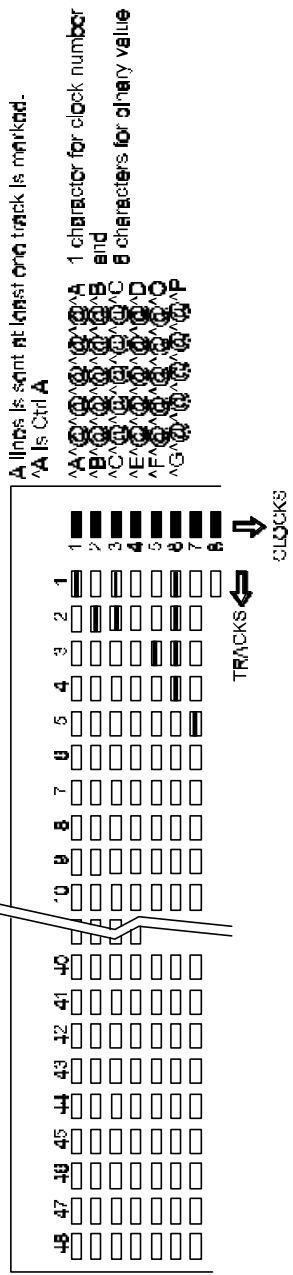
**DATA read example with program number 05:**



**DATA read example with program number 06:** (see Special binary output format, page 23)



**DATA read example with program number 07:**



### Checking clock marks

If this value is = 0, the number of clockmarks will not be checked.

If this value is > 0, then the number of clock marks will be compared with this value.

If a difference exists, the document will be rejected.

00 = no check, >00 = reject if not equal

AXF parameter example :

checking clock marks	<b>28</b>	= test if quantity of clock mark is = 40
----------------------	-----------	--

### Character to call the next document

The reader waits for the character defined here to initiate a read cycle. If this value is 00, the reader reads continuously.

AXF parameter example :

character to call the next document	<b>4C</b>	= R character
-------------------------------------	-----------	---------------

### Character to call the next record

The reader waits for the character defined here to send the next record. If this value is 00, the reader doesn't wait.

AXF parameter example :

character to call the next record	<b>00</b>	= doesn't wait
-----------------------------------	-----------	----------------

### Character to accept a document

The reader waits for the character defined here to eject a document as good.

If this value is 00, the reader eject automatically according to the tests performed by ADELE, and the action defined by the program.

AXF parameter example :

character to accept a document	<b>47</b>	= G character
--------------------------------	-----------	---------------

### Character to reject a document

The reader waits for the character defined here to reject a document to the false tray.

AXF parameter example :

character to reject a document <b>53</b> = <i>S character</i>
---

### Distance before stopping the paper

In order to read a Bar-code label at the end of a document, some readers need to stop the document later. The value means a number of steps of 0.5mm ( valid from 0 to 255 ).

AXF parameter example :

distance before stopping the paper <b>14</b> = <i>14 steps = 7 1mm later</i>
--

### Character to reload parameters

This parameter enables the user to reload a new parameters set anytime, without to press the button. If this character is received while the reader is waiting for feeding the next document, the reader will expect the new parameters set.

The default value for this parameter is ESC ( 1B Hex ).

AXF parameter example :

Character to reload parameters <b>1B</b> = <i>ESC</i>
---

### Send version number

This parameter defines the character to send for asking the version number. The character defined here will be answered only when the reader is expecting the character to call the next document, or is waiting for parameters.

AXF parameter example :

```
character to send version number 56 = V character
```

### Character for printing command

This parameter defines the character you have to send for printing the string.

AXF parameter example :

```
character for printing command 50 = P for printing command
```

### Adjust reading sensibility *(only axm 905 / 915)*

This parameter is need for adjusting the reading sensibility on the AXM 915. The sensibility between 01 and 07 is adjusted form the RS232 line.

AXF parameter example :

```
adjust reading sensibility 05 = set reading sensibility to 5
```

### Read mask

A mask may be loaded to select ON ( 1 ) or OFF ( 0 ) each of the 48 hardware tracks of the reading head.

@ must follows the last character of the table, without any other character the mask will be completed with zeroes until the end of the buffer.

AXF mask example :

```
@mask40 tracks  
1111111111111111111111111111111111111111111111111111100000@end
```

The track 1 to 5 are masked ( no mark read ) and the track 6 to 40 are enabled.

For no mask :

```
@mask00 tracks  
@end
```

## Table of communication parameters

(ASCII : any value between 00 and FE)

## @AXF

start of document characters	01 FF FF FF	ASCII
start of record characters	02 FF FF FF	"
end of record characters	0D 0A 03 FF	"
end of document characters	04 FF FF FF	"
start of error message characters	15 FF FF FF	"
end of error message characters	0D 0A 03 FF	"
character to fill the record	2E	"
qty of synch characters	00	0 to 255 (binary)
heading character	2D	ASCII
record length lsb hex	28	0 for variable length
record length msb hex	00	0 for variable length
baud rate	04	
<i>1=1200,2=2400,3=4800,4=9600,5=19200,6=38400</i>		
uart		
word length seven or eight bits	03	02= 7 bits, 03 = 8 bits
parity enable	00	00 = no parity, 01 = parity on
parity even	01	00 = odd, 01 = even
stops bits	01	01 = 1 stop 03 = 2 stops
send quantity of marks read	00	00 = not sent, 01 = send # marks
send quantity of clocks read	00	00 = not sent, 01 = send # clocks
bip number as ok	00	00,01,02,03,05,06
bip number as ko	05	00,01,02,03,05,06
send error messages	01	00 does not send 01 = send errors
wait for echo	00	00 = no wait 01 = wait for echo
delay before sending data (fifty ms)	00	00 to 255 (binary)
delay after each character (one ms)	00	00 to 255 (binary)
delay after each record (one ms)	00	00 to 255 (binary)
repeat character	52	ASCII, 00 = no wait
program number	04	01 to 07 ( see output format )
checking clock marks	00	00 = no check, >01 = reject if not equal
character to call the next document	4C	ASCII, 00 = no wait
character to call the next record	00	ASCII, 00 = no wait
character to accept a document	47	ASCII, 00 = no wait
character to reject the last doc.	53	ASCII
distance before stopping the paper	00	00 to 255 (binary) (1 unit = 0.5mm)
character to reload parameters	1B	ASCII 01 to FF
character to send version number	56	ASCII
character for printing command	50	00 no printing command
reserved	00	
reserved	00	
adjust reading sensibility	05	01 to 07 (only for axm 915)
comments :		

@MASK 40 TRACKS

either 00, 12, 40, or 48 tracks only



```
0000000000000000000000000000000000000000000000000  
0000000000000000000000000000000000000000000000000  
1111111111111111111111111111111111111111111111111  
1111111111111111111111111111111111111111111111111  
1111111111111111111111111111111111111111111111111  
1111111111111111111111111111111111111111111111111  
1111111111111111111111111111111111111111111111111  
1111111111111111111111111111111111111111111111111@END
```

*The two first lines are masked.*

*one CR character MUST  
end each line*



**CHAPTER 3 : Bar-code**

The bar-code buffer contents the data read from the bar-code in the following format.

The bar-code data follows the OMR data.

"[Cxxxx]yyyyyyy"

C = Bar-code type :

- I = interleaved 2/5 forward
- J = interleaved 2/5 backward
- A= codabar forward
- B= codabar backward
- C= code 128 for and backward
- E= code 39 forward
- F= code 39 backward
- T= EAN 8 or 13 forward
- S= EAN 8 or 13 backward

xxxx = # Distance until the end of the document  
 yyyy = Bar-code value

# Presently this value can't be converted in mm because the reliability is not guaranteed.



**CHAPTER 4 : Special binary output format**

This chapter is a technical description of the program number 06 and 07 (see Program number, page 11).

That means that the dialogue to control the axm reader remains the same as the program number 01 to 05. Only the read data output by the machine are specific.

The image of the document will be transmitted in a binary format with 8 read cells coded in each byte, that means each byte can take a value from 00 to FF and it is no more possible to use special character like CR as terminator. To get round this inconvenience we suggest to use the first byte of each block as a flag and the number of expected bytes following this flag can be found by the type of flag.

**Transmit protocol**

Data bits                      8 bits

**Data for a clock**

Flag byte                      01 .. 78 = clock number (binary hex value, max. 120 clocks)  
 Number of following bytes    6  
 Organisation of block        first byte = channels 48 to 41, last byte 8 to 1  
 Organisation of byte        LSB = lower channel (i.e. channel 1) MSB = higher channel (i.e. channel 8)

Note :

In the program number 06, the reader send all the read clocks disregarding if some channels are marked or not.

In the program number 07, only the marked lines are sent.

**End of side 1**

Flag byte                      F1 (binary hex value) (no displayable on a terminal)  
 Number of following bytes    0

**End of side 2**

Flag byte                      F2 (binary hex value) (no displayable on a terminal)  
 Number of following bytes    0

**External data (bar-code)**

Flag byte	F3 (binary hex value) (no displayable on a terminal)
Number of following bytes	variable
Organisation of block	first byte of block = delimiter, followed by ASCII string, followed by the same delimiter as in the first byte of block (example : "123456ABCD...")

**Error message**

Flag byte	F4 (binary hex value) (no displayable on a terminal)
Number of following bytes	variable
Organisation of block	same as external data (the content of the message itself is the same as in the other modes of AXF).

**End of document**

Flag byte	F9 (binary hex value) (no displayable on a terminal)
Number of following bytes	0

**Stream of data for 1 document**

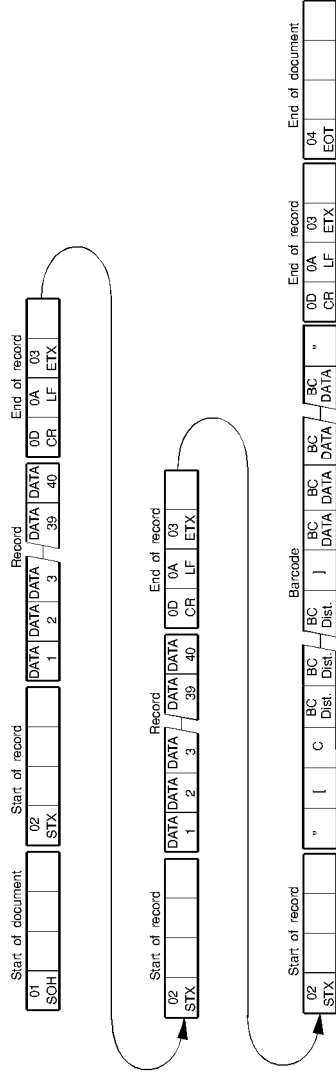
1. Data of side 1 (if any)    01 xx xx xx xx xx xx  
                                  . . .  
                                  nn xx xx xx xx xx xx
2. End of side 1 flag        F1
3. Data of side 2 (if any)    01 xx xx xx xx xx xx  
                                  . . .  
                                  nn xx xx xx xx xx xx
4. End of side 2 flag        F2
5. F3 + external data (if any) F3 22 . . . . . 22 (bar-code)
6. End of document flag     F9

That means even for an empty document F1, F2, F9 will be sent.

**CHAPTER 5 : Record example**

Record example with the Table of communication parameters from the page 20.

**RECORD EXAMPLE**







**CHAPTER 6 : Errors messages**

Nr	Messages on 16 digit display	Messages on 4 digit display	REMARKS
1	BAD FEEDING	FEED	(AFTER 3 ATTEMPTS)
2	JAM BEFORE HEAD	JAMB	
3	JAM UNDER HEAD	JAMH	
4	JAM AFTER HEAD	JAMA	
5	JAM IN SORTING	SORT	
6	NO SHEET ON LIFT	PAPR	
7	BAD TRAY FULL		
8	GOOD TRAY FULL		
9	SHEET TOO SHORT		
10	SHEET TOO THIN		
11	SHEET TOO THICK		
12	SHEET TOO LONG		
13	INCORRECT SHEET		
14	INCORRECT PARITY		
15	BAUDRATE ?		
16	IENSITIVITY ?		
17	LOW BATTERY		
18	BAD RETENTION		
19	NO SHEET TO SORT		(WHEN REJECTING)
20	PATH NOT FREE		(SHEET INTO THE READER)
21	NO BLACK GAUGING	BLAC	
22	NO DECODER		
23	LIFT ERROR		
24	CALIBRATE		
25	GOOD TRAY ERROR		(axm995 only)
26	SECURITY STOP		(axm990/995)
27	NO SHEET IN GOOD		(axm990/995)
28	NO SHEET IN BAD		(axm990/995)
64	PAUSE		



## CHAPTER 7 : ASCII characters

OCTAL	DEC	HEX	CHRS	CTRL KEY	DESCRIPTION
000	0	0	<NUL>	@	Null, tape feed.
001	1	1	<SOH>	A	Start of heading.
002	2	2	<STX>	B	Start of text.
003	3	3	<ETX>	C	End of text.
004	4	4	<EOT>	D	End of transmission.
005	5	5	<ENQ>	E	Enquiry, also WRU.
006	6	6	<ACK>	F	Acknowledge, also RU.
007	7	7	<BEL>	G	Rings the bell.
010	8	8	<BS>	H	Backspace, also FEB.
011	9	9	<HT>	I	Horizontal tab.
012	10	A	<LF>	J	Line feed, adv. cursor to next line.
013	11	B	<VT>	K	Vertical tab (VTAB).
014	12	C	<FF>	L	Form feed to top of next page.
015	13	D	<CR>	M	Carriage return to beginning of line.
016	14	E	<SO>	N	Shift out.
017	15	F	<SI>	O	Shift in.
020	16	10	<DLE>	P	Data line escape.
021	17	11	<DC1>	Q	Device ctrl 1,turns transm. on ,XON.
022	18	12	<DC2>	R	Device ctrl 2.
023	19	13	<DC3>	S	Device ctrl 3,turns transm. off ,XOFF
024	20	14	<DC4>	T	Device ctrl 4.
025	21	15	<NAK>	U	Negative acknowledge, also ERR .
026	22	16	<SYN>	V	Synchronous idle (SYNC).
027	23	17	<ETB>	W	End of transmission block.
030	24	18	<CAN>	X	Cancel (CANCL), escape sequence.
031	25	19	<EM>	Y	End of medium.
032	26	1A	<SUB>	Z	Substitute.
033	27	1B	<ESC>	[	Escape.
034	28	1C	<FS>	\	File separator.
035	29	1D	<GS>	]	Group separator.
036	30	1E	<RS>	^	Record separator.
037	31	1F	<US>	_	Unit separator.
040	32	20	<SP>		Space.
041	33	21	<!>		Exclamation point.
042	34	22	<">		Quotation mark
043	35	23	<#>		Number sign.
044	36	24	<\$>		Dollar sign.
045	37	25	<%>		Percent sign.
046	38	26	<&>		Ampersand.
047	39	27	<'>		Acute accent or apostrophe.
050	40	28	<( >		Open parenthesis.
051	41	29	<)>		Close parenthesis.
052	42	2A	<*>		Asterisk.
053	43	2B	<+>		Plus sign.
054	44	2C	<, >		Comma.

OCTAL	DEC	HEX	CHRS	CTRL KEY	DESCRIPTION
055	45	2D	<->		Hyphen or minus sign.
056	46	2E	<.>		Period.
057	47	2F	</>		Slash.
060	48	30	<0>		Number 0.
061	49	31	<1>		Number 1.
062	50	32	<2>		Number 2.
063	51	33	<3>		Number 3.
064	52	34	<4>		Number 4.
065	53	35	<5>		Number 5.
066	54	36	<6>		Number 6.
067	55	37	<7>		Number 7.
070	56	38	<8>		Number 8.
071	57	39	<9>		Number 9.
072	58	3A	<:>		Colon.
073	59	3B	<:>		Semicolon.
074	60	3C	<<>		Less than.
075	61	3D	<=>		Equal sign.
076	62	3E	<>>		Greater than.
077	63	3F	<?>		Question mark.
100	64	40	<@>		At sign.
101	65	41	<A>		Letter A.
102	66	42	<B>		Letter B.
103	67	43	<C>		Letter C.
104	68	44	<D>		Letter D.
105	69	45	<E>		Letter E.
106	70	46	<F>		Letter F.
107	71	47	<G>		Letter G.
110	72	48	<H>		Letter H.
111	73	49	<I>		Letter I.
112	74	4A	<J>		Letter J.
113	75	4B	<K>		Letter K.
114	76	4C	<L>		Letter L.
115	77	4D	<M>		Letter M.
116	78	4E	<N>		Letter N.
117	79	4F	<O>		Letter O.
120	80	50	<P>		Letter P.
121	81	51	<Q>		Letter Q.
122	82	52	<R>		Letter R.
123	83	53	<S>		Letter S.
124	84	54	<T>		Letter T.
125	85	55	<U>		Letter U.
126	86	56	<V>		Letter V.
127	87	57	<W>		Letter W.
130	88	58	<X>		Letter X.
131	89	59	<Y>		Letter Y.

132	90	5A	<Z>	Letter Z.
-----	----	----	-----	-----------

OCTAL	DEC	HEX	CHRS	CTRL KEY	DESCRIPTION
133	91	5B	<[>		Open brackets.
134	92	5C	<[>		Reverse slash.
135	93	5D	<]>		Close Brackets.
136	94	5E	<^>		Up arrow / caret.
137	95	5F	<_>		Underscore.
140	96	60	<'>		Grave accent.
141	97	61	<a>		Letter a.
142	98	62	<b>		Letter b.
143	99	63	<c>		Letter c.
144	100	64	<d>		Letter d.
145	101	65	<e>		Letter e.
146	102	66	<f>		Letter f.
147	103	67	<g>		Letter g.
150	104	68	<h>		Letter h.
151	105	69	<i>		Letter i.
152	106	6A	<j>		Letter j.
153	107	6B	<k>		Letter k.
154	108	6C	<l>		Letter l
155	109	6D	<m>		Letter m.
156	110	6E	<n>		Letter n.
157	111	6F	<o>		Letter o.
160	112	70	<p>		Letter p.
161	113	71	<q>		Letter q.
162	114	72	<r>		Letter r.
163	115	73	<s>		Letter s.
164	116	74	<t>		Letter t.
165	117	75	<u>		Letter u.
166	118	76	<v>		Letter v.
167	119	77	<w>		Letter w.
170	120	78	<x>		Letter x.
171	121	79	<y>		Letter y.
172	122	7A	<z>		Letter z.
173	123	7B	<{>		Left brace.
174	124	7C	< >		Vertical bar (broken).
175	125	7D	<}>		Right brace.
176	126	7E	<~>		Tilde.
177	127	7F	<DEL>		Delete ( reboot )



CHAPTER 8 : Hex code description

Hex	Binary		8	7	6	5	4	3	2	1	
01	0000	0001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
02	0000	0010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
03	0000	0011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
04	0000	0100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
05	0000	0101	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
06	0000	0110	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6
07	0000	0111	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7
08	0000	1000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
09	0000	1001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9
0A	0000	1010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
0B	0000	1011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11
0C	0000	1100	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12
0D	0000	1101	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13
0E	0000	1110	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14
0F	0000	1111	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15
10	0001	0000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16
11	0001	0001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17
12	0001	0010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	18
13	0001	0011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	19
14	0001	0100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20
15	0001	0101	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21
16	0001	0110	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22
17	0001	0111	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	23
18	0001	1000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24
19	0001	1001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	25
1A	0001	1010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	26
1B	0001	1011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	27
1C	0001	1100	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	28
1D	0001	1101	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	29
1E	0001	1110	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	30
1F	0001	1111	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	31
20	0010	0000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32
21	0010	0001	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	33
...											34



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