

Training : the Minitel

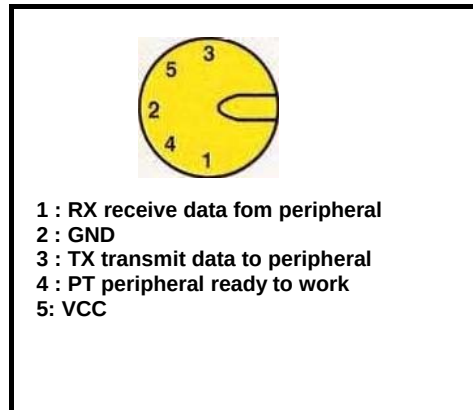


Figure 1 – Pinout of the DIN 5-pin connector

This article has more the intention to give technical information about the Minitel rather than giving an historical description of the Minitel, this is why you will see some lists of control sequences codes of the different elements inside the Minitel.

General description

The Minitels integrate the following elements : main plug, crt, modem, keyboard. Different types of terminals exist from the M1b (no longer manufaturated replaced by the M2) to the M12, but all are compatibles between

TABLEAU 1
FUNCTION KEYS

KEY	HEXA	DECIMAL
Envoi	1341	1965
Suite	1348	1972
Retour	1342	1966
Repetition	1343	1967
Correction	1347	1971
Annulation	1345	1969
Guide	1344	1968
Sommaire	1346	1970
Sonnerie	136C	19108
Connexion/Fin	1349	1973

One another for most of the principal commands.

To connect to the teletel server, phone line is used to an organ called PAVI (Point d'Accès Vidéotex). Then the TRANSPAC network assure the task. Once connexion is established, all happen as if the Minitel was directly connected to the computer of the server center.

A peripheral connector is on the back of the Minitel, allowing a serial connexion with a computer. It is needed that the signals must be adapted because they are between 0-5V and TX requires a pull up resistor.

Nevertheless, the protocol is very standard as it is a asynchronous line at 1200 bauds, 7 bits, 1 bit mark parity, 1 stop bit. Pinout of the connector is given on Figure 1. We can also note that the VCC output of 8.5V can source 1A current.

TABLEAU 2
LES CODES SEP

FUNCTION	HEXA	DEC.
Activation PCE	134A	1974
Desactivation PCE	134B	1975
Retournement	134C	1976
modem Opposition	134d	1977
modem Chgt etat	1350	1980
Modem speed	1351	1981
Cnx/Decnx Mod.	1353	1983
Chg state PT line	1354	1984
Status operating	1356	1986
Transparence	1357	1987
Debut retournement	1358	1988
Debut Cnx/Cnx Chgt	1359	1989
Current state chg	1358	1991
St/end screen copy	135C	1992
Reset vidéotex	135E	1994
Reset vidéotex	136C	19 108
Mixte mode	1370	19 112
Videotex mode	1371	19 113
Standby	1372	19 114

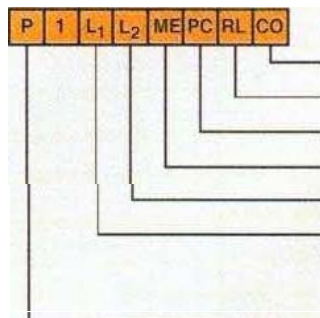
SCREE



1 : LA LIGNE EST PRISE
1 : NUMEROTATION EN
FREQUENCE VOCALE

1/ DETECTION SONNERIE

T



1 :80 COLUMNS
1 : MODE ROULEAU
1 : PCE ACTIVE
1 : LOWER CASES

L1	L2	
0	0	PAS DE LOUPE
0	1	LOUPE HAUTE
1		PARITE PAIRE



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0 : ACQ TO MODEM
0 : ACQ CONNECTOR
1 : MODE PAD x 3
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KEYB.STATUS

7 6 5 4 3 2 1 0

0 : SLEEP Mode
1 : EXTENDED MODE
0 : MODE CSI

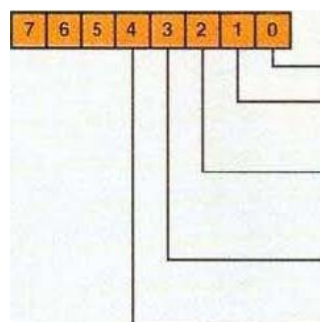
SCREEN STATUS

7 6 5 4 3 2 1 0 0: SCREEN IN SLEEP
MODE

STATUS MODEM

7 6 5 4 3 2 1 0

1 : APPEL AUTOMATIQUE DEMANDE



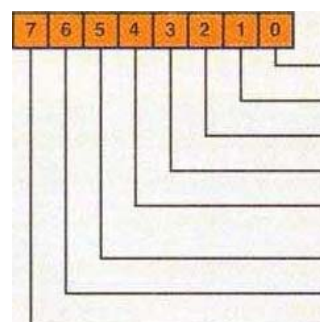
1 : OPPOSITION
1 : 1200 BAUDS

1 : MODULE
TELEPHONIQUE
PRESENT

1 : DETECTION PORTEUSE

STATE OF PT

AIGUILLAGES



1 : LIAISON ECRAN ETABLIE

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1 : LIAISON CLAVIER ETABLIE
1 : LIAISON MODEM ETABLIE
1 : LIAISON PRISE ETABLIE
TELEPHONIQUE ETABLIE

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0
1
1: MARK PARITY

Figure 2 – The different bytes of status that can be taken with PRO3 sequences

The MINITEL commands

Using the codes is very simple: once the minitel is connected to the computer with a cable with serial line connexion established, you only have to send the sequence to the minitel so that it can recognize it.

- SEP codes (tableau 2) just for information not useful in simple operation of the Minitel
- PRO1 protocol (tableau 3) main commands from modem and line are in this protocol
- PRO2 protocol (tableau 4): R is for receiver, E is for transmitter and S for Status
- PRO3 protocol (tableau 5) allow echo of key pressed, or suppress on-screen display (during a download for example) the code for tx and rx modules are given tableau 6. Figure 2 contain the different bytes of status that can be obtained from PRO3 sequences.

Videoext commands

These commands are useful to create videotex pages. They allow to control the display parameter of the size and color of characters. Minitel screen is composed of 40 columns and 24 lines , plus line 0 (this line has a particular state and is generally never used in graphic pages).

Presentation of the different codes

- the function keys (tableau 1) ; different special keys for example, to send ENVOI to the Minitel you have to send code 13 then the code 41 (in hexadecimal)

**TABLEAU 3
LES CODES PRO1**

FUNCTION	HEXA	DÉCIMAL
Reinitialisation videotex	1B397F	27 57 127
Identification ROM	1B397B	27 57 123
Deconnexion	1 B 39 67	27 57 103
Connexion	1 B 39 68	27 57 104
Retournement modem	1 B 39 6C	27 57 108
Retournement inverse	1B396D	27 57 109
Acquittement retournement	1 B 39 6E	27 57 110
Opposabilite	1 B 39 6F	27 57 111
Prise de ligne	1 B 39 53	27 57 83
Liberation de ligne	183957	27 5787

STATUS REQUEST

Status telephone	1 B 39 5A	275790
Status terminal	1B3970	2757 112
Status fonctionnement	1B3972	2757 114
Status vitesse	1B3974	2757116

**TABLEAU 5
LES CODES PRO2**

FUNCTION	HEXA	DECIMAL
Arret aiguillage	1B 3B 60 R E	27 59 96 R E
Retablissement aiguillage	1B 3B 61 R E	27 59 97 R E
Signalisation d'appel ON	1B 3B 69 5A	27 59 1059066
Signalisation d'appel OFF	1B 3B 6A 4A 42	27 59 1069066
Clavier etendu	1 B 3B 69 59	2759 1058965
Clavier standard	1 B 3B 6A 59	2759 1068965
Clavier CSI	1B 3B 69 59 43	2759 1058967
Codage CO	1 B 3B 6A 59	27 59 1068967
Numeroter fiche repertoire	1B 3B 51 3X 3Y	275981 -
Numeroter dernier num 11	1 B 3B 52 3X 3Y	27 59 82 -

STATUS REQUEST

Clavier	1B 3B 73 59 S	2759 11589S
Modem	1B 3B 73 5A	2759 11590S
Aiguillage	1B 3B 63 C/S	27 59 99 C/S
Ecran	1B 3B 73 58 S	2759 11588S

SLEEP MODE

Go to Sleep mode	1B 3B 69 58 41	27 59 105 88 65
Escape sleep mode	1B 3B 6A 58 41	27 59 106 88 65

**TABLEAU 4
LES CODES PRO2**

FUNCTION	HEXA	DECIMAL
Non diffusion	1B 3A 64 R	27 58 100 R
Diffusion acquittement	1B 3A 65 R	27 58 101 R
Non retour acquittement	1B 3A 64 E	27 58 100 E
Retour acquittement	1B 3A 65 E	27 58 101 E
Transparence	1B 3A 66 N	27 58 102 N

CHANGEMENTS DE MODE

Teleinformatique	1B 3A 3171)	27 58 49 125
Mixte	1B 3A 32 71)	27 5850 125
Copie ecran fran-ais	1 B 3A 7C	2758 124 106
Copie ecran americain	1B 3A 7C 6B	27 58 124 107
Mode rouleau	1B 3A 69 43	27 58 10567
Mode page	1B 3A 6A 43	275810667
Modem esclave	1B 3A 6F 31	2758 111 49
Debut PCE	1 B 3A 69 44	27 58 10568
Fin PCE	1 B 3A 6A 44	27 58 10668

VITESSE DE LA PRISE, CLAVIER

300/300	1 B 3A 6B	27 58 10782
1200/1200	1 B 3A 6B	2758 107 100
4800/4800	1 B 3A 6B	2758 107 118
9600/9600	1 B 3A 6B	2758 107 127
Clavier minuscule	1B 39 69 45	27 57 10569
Clavier majuscule	1 B 39 6A 45	27 57 10669

DEMANDES DE STATUS

Telephone	1 B 39 58 S	27 57 91 S
Terminal	1 B 39 71 S	2757 113S
Fonctionnement	1B 39 73 S	2757 115S
Vitesse	1 B 39 75 S	2757 117S
Protocole	1 B 39 77 S	2757 119S
Clavier	1B 39 72 59	27 57 11489
Modem	1 B 39 72 5A	27 57 11490
Aiguillage	1B 39 62 R/E	27 57 98 R/E

TX/RX codes

i

Module transmit	Hexa	Decimal
Screen	50	80
Keyb.	51	81
Modem	52	82
DIN Connector	53	83
Phone line	54	84
MODULE RECEPTEUR	HEXA	DECIMAL
Ecran	58	88
Clavier	59	89
Modem	5A	90
DIN connector	5B	91
Phone line	5C	92

TABLEAU 7

VIDEOTEX COMMANDS

HEXA	KEYB. SEQUENC ES	ACTION
08	Ctrl/H	recule le curseur d'un pas
09	Ctrl/I	avarice le curseur d'un
0A	Ctrl/J	descend le curseur d'un
0B	Ctrl/K	remonte le curseur d'un
0C	Ctrl/L	efface la page
0D	Ctrl/M	retour chariot (sans saut de
1E	Ctrl/.	home (curseur en debut de
1F	Ctrl R	positionne le curseur en
11	Ctrl Q	apparition du curseur
14	Ctrl/T	disparition du
12 N	Ctrl/R N	repete le dernier caractere N
18	Ctrl X	propage les attributs sur la
OE	Ctrl N	mode graphique
OF	Ctrl 0	mode texte
07	Ctrl G	bip sonore
1B 40	ESC @	Black ink
1 B 44	ESC D	Blue ink
1 B 41	ESC A	Red ink
18 45	ESC E	Magenta ink
1B 42	ESC B	Green ink
113 46	ESC F	Cyan ink
1 B 43	ESC C	Yellow ink
113 47	ESC G	White ink
113 50 20	ESC P [1	Black rear
113 54 20	ESC T (1	Blue rear
1B 5120	ESC Q I 1	Red rear
1B 55 20	ESC U I 1	Magenta rear
1 B 52 20	ESC R I 1	Green rear
113 56 20	ESC V I 1	Cyan rear
185320	ESC S I 1	Yellow rear
185720	ESC W I 1	White rear
1B 5D	ESC I	Video invert start
1B 5C	ESC \	Video invert end
1B 48	ESC H	Blinking display start
113 49	ESC I	Blinking display end
1B 5A 20	ESC Z I 1	Underlined start Of mode
1B 59 20	ESC Y I 1	Underlined end Of mode jointif
1B 4C	ESC L	Normal size display
18 4D	ESC M	double height
1B 4E	ESC N	Double width
113 4F	ESC 0	double size
1B 58	ESC X	Line hide
1B 5F	ESC-	Line display
1B 23 20 58	ESC # X	Global screen hide
1B 23 20 5F	ESC #	Global screen display
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