Professional Video by i2e

ViA9.5

Introduction

With the **ViA9.5** one can insert text into an attached video signal.
The text to be inserted and several attributes or parameters are controlled via a serial interface (RS232). Any simple terminal program can be used. As an option, a standard PS2 keyboard can be directly connected, then not even a computer is needed.
Additionally the **ViA9.5** contains a realtime clock (battery buffered), therefore it can display the actual time and date.

Overview

How much characters can be displayed ?
A maximum of 1000 characters can be displayed, arranged in 25 rows with 40 columns each.

How can the appearance of the characters be influenced ?
There are several attributes that defines the appearance of the characters
characters can be displayed with or without background
characters can be displayed in 2 different heights
the contrast of displayed characters and backgrounds can be reduced
characters can be displayed flashing

Are the settings non-volatile ?
A non-volatile parameter memory (EEPROM) keeps several settings when the **ViA9.5** is switched off. So they don't have to be set again after power-up.

How does the ViA9.5 behave when the video source is instable (VTR) ?
The time constant of the character clock can be adapted to instable video sources (VTRs), so the inserted characters stay smooth.

Can the entire display be switched on and off fast?
With a single command one can switch the entire display off. The written characters stay in memory and can be made visible again with a another command.

What else to say ?
The **ViA9.5** contains a battery buffered real time clock and can display the actual time and date. As an option, a PS2 keyboard can be attached directly, so one does not even need a computer to set text and parameters.
The firmware is contained in a FLASH memory and can get easily updated via the serial interface. So customer specific changes of the firmware, new features and options, can be realized very quick and easy.

Mode key

The "Mode" key on the back of the unit can be adapted to many different functions, depending on the customer needs.
In the standard design of the **ViA9.5** it has just one function, but a very important one: If the "Mode" key is kept pressed during power-up of the **ViA9.5**, it will start with the following configuration:

- ASCII mode/ 9600Bd

Any different configuration that may have been set up before is ignored, until the next power-up without a pressed "Mode" key.
So one can communicate with the **ViA9.5**, even if its current configuration is unknown. If the **ViA9.5** operates in terminal mode, a change to ASCII mode can just be made with the help of the "Mode" key.
In principle a change of the parameters for mode and baudrate will be adopted only after the next power-up of the unit.

Screen format

A maximum of 1000 characters can be displayed. They will get arranged in a fixed graticule of 25 rows with 40 columns each.
The rows are numbered from top to bottom, starting with 1. The columns are numbered from left to right, starting with 1. Therefore the character in the upper left corner is at display position 1 / 1, the character in the lower right corner at 25 / 40.

Character attributes

The appearance of the characters is determined by some attributes as there are:

Character height	single / double
Flash mode	on / off
Character background	none / solid / transparent / fringe

These attributes are valid for all characters in the row in which the corresponding attribute was defined (row attributes). Decisive which row will be influenced by a change of a certain attribute is the actual display position. If you want to change a character attribute (row attribute) you have to set the display position to the row where you want the change to become valid.
The default values for the row attributes are:

Character height	single
Flash mode	off
Character background	solid

Practical use

There are several commands to display a text with a certain format at a certain position.

Positioning of text

Prior to the text itself, the position where the text should be displayed, is to be set (display position). It defines the coordinate in the screen graticule (25 x 40) where following text will be displayed.

ASCII mode

The position where text will be displayed is defined by the actual display position. With a definite command this display position can be set to any position inside the screen graticule (25 x 40). Any text that is send afterwards will be displayed starting from this location on. The display position is not changed by sending text. So the next written text is displayed at the same location and will overwrite the prior written text.
If the text does not fit in the actual row, it will be truncated.

After power-up and any "Clear display" command the display position is at row 1 / column 1 (1/1, "home").

Terminal mode
not yet available

Writing of text and attributes

After setting the actual display position, the text to be displayed and the attributes that control the appearance of the text can be written.

ASCII mode
The text to be displayed at the actual display position is set with a definite command that contains the text string with a maximum length of 40 characters (1 row). The appearance of the text is controlled by attributes that are valid for just one row. With several definite commands the attributes can be set for the row of the actual display position. It does not matter if the text is written prior to the attributes or afterwards. Normally one first sets all attributes for the row of the display position and finally set the text to be displayed.

Terminal mode
not yet available

Characterset

The single characters are displayed with a resolution of 10x12 pixels. If the character height is selected as "double", the width of the characters stay the same, just the vertical pixels will be displayed twice (12 rows with 40 columns each).
The characterset corresponds to the ASCII standard.

Table of charactercodes

Code	*20-2F*	*30-3F*	*40-4F*	*50-5F*	*60-6F*	*70-7F*
0	Space	0	§	P	°	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	#	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	Ä	k	ä
C	,	<	L	Ö	l	ö
D	-	=	M	Ü	m	ü
E	.	>	N	^	n	ß
F	/	?	O	_	o	Space

After power-up

After power-up the **ViA9.5** starts with a cleared screen and the actual display position will be set to 1 / 1 (upper left corner, "Home"). All character attributes (row attributes) are set to their default values.
If enabled, time and/or date is displayed in the prior selected position.
Now the **ViA9.5** waits for commands over the serial interface, corresponding to the prior selected serial mode. Please see the description of the "Mode" key.

Non-volatile parameter memory

The following parameters will be kept in a non-volatile memory area (*EEPROM*) and so the **ViA9.5** starts with the last written values of this parameters at any power-up.

Serial mode
Baudrate
Type of videosource (stable/instable)
Contrast reduction
Time on/off
Time position
Date on/off
Date position

Attention:
The **ViA9.5** does not have an internal video source. So you have to connect an external source at "Video In" to get inserted characters visible at "Video Out". (Optional internal video source possible)

Command descriptions (ASCII / Terminal mode)

General commands (general settings)

Set serial mode

This command selects the mode of the serial interface. A new mode setting will become active not until the next power-up. Have a look at the description of the "Mode" key. The mode setting is non-volatile.

Mode	Command / Parameter
ASCII	SA 1 ASCII mode SA 2 Terminal mode, VT52
Terminal	not available

Set baudrate

This command selects the baudrate for the serial interface. A new baudrate setting will become active not until the next power-up. Have a look at the description of the "Mode" key. The baudrate setting is non-volatile.

Mode	Command / Parameter
ASCII	SF 0 9600Bd, 8,N,1 SF 1 19200Bd, 8,N,1 SF 2 38400Bd, 8,N,1
Terminal	not available

Get device identification

This command requests the device identification string. This string contains the name of the unit (e.g. **ViA9.5**) and the actual firmware version.

Mode	Command / Parameter
ASCII	GD
Terminal	not available

Video / text commands

Clear screen

The entire screen will be cleared. The display position is reset to row 1 / column 1. All row attributes (height, background …) are reset to their defaults.

Mode	Command / Parameter
ASCII	SDX
Terminal	ESC_J

Clear row

The entire row of the actual display position will be cleared. The display position is reset to column 1 of the actual row. Previous set row attributes are not reset.

Mode	Command / Parameter
ASCII	SDY
Terminal	ESC_K

Set display position (cursorposition)

The display position (the cursor) is set to the stated values for row and column. A following display write operation ("Set text") will refer to this position. After power-up the display position will be row 1 / column 1, the display is cleared and all attributes are reset to there default values.

Mode	Command / Parameter
ASCII	SDP *x y* *x=row (1-25) y=column(1-40)*
Terminal	not available

Set text

When in ASCII mode, the stated string will be printed from the actual display position on. There is no line-wrap. If the string does not fit into the actual line, it will be truncated. The display position is not changed after giving this command. So, if there is no new position set, the next string will be printed to the same position.
When in terminal mode, any ASCII character on the serial interface will be printed to the actual display position. Then the display position (the cursor) is shifted one position to the right. If the display position was in the last column of a row, the next display position will be column 1 in the next row.

Mode	Command / Parameter
ASCII	SDC *"Text*
Terminal	any ASCII character (20H - 7FH) will be printed

Set character height

All characters in the row of the actual display position will get the stated height. If one row gets double height, the following row will be shifted down. So rows at the bottom of the screen may disappear. If all rows should get double height, just the rows 1 to 12 are displayed in full, row 13 in half, rows 14 to 25 are no longer visible. So double height just makes sense in rows 1 to 24. If row 25 gets double height, just the upper half of the row will be displayed.

Mode	Command / Parameter
ASCII	SDH 0 single height SDH 1 double height
Terminal	CTRL_R single height CTRL_S double height

Set character background

All characters in the row of the actual display position will get the stated background.

Mode	Command / Parameter
ASCII	SDB 0 no background SDB 1 solid background SDB 2 transparent background SDB 3 fringe background (special characterset)
Terminal	CTRL_N no background CTRL_Y solid background CTRL_xxx transparent background CTRL_xxx fringe background (specil characterset)

Set flash mode

All characters in the row of the actual display position will get the stated flash mode.

Mode	Command / Parameter
ASCII	SDF 0 no flash SDF 1 flashing
Terminal	ESC_G no flash ESC_F flashing

Character clock regulation

If the videosource is unstable (VTR), the time constant of the character PLL can be reduced. So the insertion gets less sensible against short disturbances (jitter). This adjustment is non-volatile when set in ASCII mode, but not when set in terminal mode.

Mode	Command / Parameter
ASCII	MP 0 stable videosource (e.g. camera) MP 1 unstable videosource (e.g. VTR)
Terminal	CTRL_P stable videosource (e.g. camera) CTRL_Q unstable videosource (e.g. VTR)

Display on / off

This command controls the visibility of the entire display. The display data (printed characters and attributes) itself stay unchanged. After power-up the display is always on (characters visible).

Mode	Command / Parameter
ASCII	MH 0 insertion off MH 1 insertion on
Terminal	CTRL_C insertion off CTRL_B insertion on

Contrast reduction

The contrast of all the printed characters and backgrounds can be reduced, so that they get transparent. This adjustment is non-volatile when set in ASCII mode, but not when set in terminal mode.

Mode	Command / Parameter
ASCII	MC 0 high contrast MC 1 reduced contrast
Terminal	CTRL_D high contrast CTRL_E reduced contrast

Cursor on / off

In terminal mode the actual display position can be made visible with a cursor. After power-up the cursor is invisible.

Mode	Command / Parameter
ASCII	not available
Terminal	CTRL_A cursor visible CTRL_U cursor invisible

Realtime clock commands

Time on / off

This commands controls the visibility of the time value of the internal realtime clock.

Mode	Command / Parameter
ASCII	SCA 0 time off SCA 1 time on
Terminal	not available

Adjust time

This commands adjusts the time value of the internal realtime clock.

Mode	Command / Parameter
ASCII	SCB x y z adjust time x = hours, y = minutes, z=seconds
Terminal	not available

Time display position

This command controls the display position of the time.

Mode	Command / Parameter
ASCII	SCC *x y* *x=row (1-25) y=column(1-40)*
Terminal	not available

Date on / off

This commands controls the visibility of the date value of the internal realtime clock.

Mode	Command / Parameter
ASCII	SCD 0 date off SCD 1 date on
Terminal	not available

Adjust date

This command adjusts the date value of the internal realtime clock.

Mode	Command / Parameter
ASCII	SCE x y z adjust date x = day, y = month, z=year
Terminal	not available

Date display position

This command controls the display position of the date.

Mode	Command / Parameter
ASCII	SCF *x y* *x=row (1-25) y=column(1-40)*
Terminal	not available

Example 1

The text "Camera1" should be displayed with solid background at the beginning of row 24.

ASCII mode:

SDP 24 1<CR>	display position to row 24 / column 1
SDB 1<CR>	set solid background for row 24 (default)
SDC "Camera1<CR>	set text

Example 2

The text "Record" should be displayed flashing with transparent background at the beginning of row 1.

ASCII mode:

SDP 1 1<CR>	display position to row 1 / column 1
SDF 1<CR>	set flash for row 1
SDB 2<CR>	set transparent background for row 1
SDC "Record<CR>	set text

ASCII mode

Video / text commands

Computer > ViA9.5		ViA9.5 > Computer	
Command	**Input**	**Answer**	**Output**
Contrast reduction high contrast reduced contrast	 MC 0 MC 1	Accepted, Error	OK ER
Set text	 SDC *1	Accepted Error	OK ER
Clear screen	 SDX	Accepted Error	OK ER
Clear row	 SDY	Accepted Error	OK ER
Display position (Cursorposition)	 SDP *2	Accepted Error	OK ER
Character height single double	 SDH 0 SDH 1	Accepted Error	OK ER
Character background none solid transparent fringe	 SDB 0 SDB 1 SDB 2 SDB 3	Accepted Error	OK ER
Flash mode on off	 SDF 1 SDF 0	Accepted Error	OK ER
Videosource stable (norm) unstable (VTR)	 MP 0 MP 1	Accepted Error	OK ER
Display on/off on off	 MH 1 MH 0	Accepted Error	OK ER

General commands

Computer > ViA9.5		ViA9.5 > Computer	
Command	**Input**	**Answer**	**Output**
Serial mode		Accepted,	OK
ASCII mode	SA 1	Error	ER
Terminal mode	SA 2		
Baudrate		Accepted,	OK
9600 Bd, 8,N,1	SF 0	Error	ER
19200Bd, 8,N,1	SF 1		
38400Bd, 8,N,1	SF 2		
Get device identification	GD	Accepted,	
		device identification	D *3
		Error	ER

Realtime clock commands

Computer > ViA9.5		ViA9.5 > Computer	
Command	**Input**	**Answer**	**Output**
Time on/off		Accepted,	OK
on	SCA 1	Error	ER
off	SCA 0		
Adjust time		Accepted,	OK
	SCB *4	Error	ER
Time display position		Accepted,	OK
	SCC *2	Error	ER
Date on/off		Accepted,	OK
on	SCD 1	Error	ER
off	SCD 0		
Adjust date		Accepted,	OK
	SCE *5	Error	ER
Date display position		Accepted,	OK
	SCF *2	Error	ER

Explanations for ASCII mode

Parameter formats:

***1 Text to be displayed, prefaced by "**
<DOUBLEQUOTES> TEXT, max. 40 characters

***2 Display position, 2 decimal numbers**
Row 1 decimal number (1/2 ASCII characters) <1...25>
Column 1 decimal number (1/2 ASCII characters) <1...40>

***3 Device identification, 10 ASCII characters**
Format: Name of device, firmware version
(e.g **ViA9.5**2.0a)

***4 Time value for realtime clock, 3 decimal numbers**
Hours 1 decimal number (1/2 ASCII characters) <0...23>
Minutes 1 decimal number (1/2 ASCII characters) <0...59>
Seconds 1 decimal number (1/2 ASCII characters) <0...59>

***5 Date value for realtime clock, 3 decimal numbers**
Day 1 decimal number (1/2 ASCII characters) <1...31>
Month 1 decimal number (1/2 ASCII characters) <1...12>
Year 1 decimal number (1/2 ASCII characters) <0...99>

Command syntax:

Any command consists of an
abbreviation, consisting of 2 or 3 letters,
and possibly appended
data or parameters
Any command has to be completed by
<CR>

Any character will be echoed, ***BACKSPACE*** is supported.

The parameters can be appended with or without a separating character (SPACE). Several parameters can be appended without a separating character (SPACE) if their length in each case makes them unmistakable. Otherwise they have to be separated (SPACE).

Example:

Display position to row 1 / column 1
Allowed:
SDP0101<C*R*>
or:

SDP<*SPACE*>**01**<*SPACE*>**01**<C*R*>

or:

SDP<*SPACE*>**1**<*SPACE*>**1**<C*R*>

but not allowed:

SDP11<C*R*> **!!**

Answers :

Any command will be answered with a
confirmation or error message, consisting of 2 letters
or if data has to be returned an
abbreviation, consisting of 1 letter
and following
data or parameters.
Any answer is completed by
<C*R*>

Example:

The device identification should be requested:
Command:
GD<*CR*>
Answer:
DViA9.52.0a<*CR*>

The entire screen should be cleared:
Command:
SX<C*R*>
Answer:
OK<C*R*>

An unknown command is entered:
Command:
KK<C*R*>
Answer:
ER<C*R*>

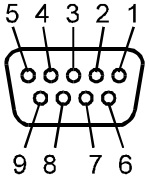
Setting of a terminal program used for entering commands:

Local echo	**off**
CR > CR+LF	receive **on**, transmit **off**
Baudrate	corresponding to **ViA9.5** (**9600/19200/38400**)
Parity	**none**
Parameter	**1 startbit, 8 databits, 1 stopbit**
Protocol	**none**

Socket connectors

Serial interface (*RS232*)

Sub-D 9pin socket



Pin1	NC
Pin2	*TxD*
Pin3	*RxD*
Pin4	NC
Pin5	*GND*
Pin6	*NC*
Pin7	*NC*
Pin8	*NC*
Pin9	NC

Powersupply

Coax, 5mm/2.1mm

Outside	*GND*, 0V
Inside	+ 8-12V DC / max. 300mA

Defaults

Default values of non-volatile parameters:

Interface mode	**ASCII mode**
Baudrate	**9600Bd**
Contrast reduction	**no contrast reduction**
Type of videosource	**unstable videosource (VTR)**
Time on/off	**time on**
Time position	**row 1 / column 1**
Date on/off	**date on**
Date position	**row 2 / column 1**

Default values of row attributes:

Character height	**single height**
Character background	**solid background**
Flash mode	**no flash**