Intelligent Terminals PCD7.D7xx

For PCD8.D81W starting from Version 4.10



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1) Introduction

The new generation of intelligent industrial terminals offers the following advantages over the former PCD7.D8xx terminals:

- easy to use programming tool for Windows '95, '98 et NT
- touchscreens available
- Profibus-DP slave connection possible (but not recommended)
- at least 4 project languages available
- random sequences and not only start/stop sequences for terminals with function keys
- individual password protection for each field or key with 10 levels of protection
- alarms can be collected from several PLC's
- drivers for all common PLC manufacturers
- gateway functionality possible with terminals having two serial ports (for example Siemens S7 <> SAIA PCD)
- access as well to inputs, outputs, flags/merker
- key presses can activate macros

The "old" PCD7.D8xx terminals will still be available for a couple of years, but for new applications the new range should be used. Projects created with the DOS tool unfortunately can't be transferred to the windows tool, so the dialogue has to be recreated from scratch.

	ESA-	Function	Text	Graphics	Colors	Language
PCD7.	designation	keys	(Charakter)	(Pixels)		S
D790	VT050W00000	5	2 x 20	-	1	4
D795	VT060W00000	4	4 x 20	-	1	4
D700	VT150W00000	5 (+20, ***)	4 x 20	-	1	6
D706	VT150W000DP					
D709	VT100MT1000					
D710	VT170WA0000	12	4 x 20	-	1	8
D720	VT190WA0000	24	4 x 40	-	1	8
D725	VT190WAP000					
D730	VT300WA0000	24	8 x 40,	240 x 64	1	8
D735	VT300WAP000		4 x 20,			
			2 x 10			
D740	VT310WA0000	21	16 x 40,	240 x 128	1	8
D745	VT310WAP000		8 x 20,			
			4 x 10			
D750	VT320WA0000	28	16 x 40,	320 x 240	16	8
D755	VT320WAP000		8 x 20,			
			4 x 10			
D760	VT555WA000	Touchscreen	16 x 40,	240 x 128	1	8
D765	VT555WAP00		8 x 20,			
D766	VT555WAP0DP		4 x 10			
D770	VT565WA0000	Touchscreen	16 x 40,	320 x 240	16	8
D775	VT565WAP000		8 x 20,			
			4 x 10			
N705		Touchearaan	20 v 80	640 x 490	16	Q
D700		TOUCHSCIECT		040 x 400		U
D/00	v1505VVAP100		16 x 32,			
			32 x 64			

*** PCD7.D70X extendable with a PCD7.D709 for 20 extra function keys.

3) Network topology

Mode D (RS 232, RS 485, RS 422, TTY 20 mA) point to point connection



S-Bus (RS 232, RS 485, RS 422, TTY 20 mA)



ţ



MPI (xx7, RS 485)



ESA-NET with Mode D, S-Bus or MPI



Remark: The ESA-NET server terminal (connected to the PLC) must have two ports. A good choice are the PCD7.D760 touchscreen terminals for ESA-NET networks as they can be client and server and are not very expensive.

Profibus-DP



The PCD contains a driver per slave terminal which leads to long cycle times which means long reaction times on the whole DP network (up to 16 ms per terminal). Therefore the use of terminals as DP slaves is not recommended.

4) Programming and connection cables

The programming cable contained in the PCD8.D81W programming package can be used to program the whole range of PCD7.D7xx terminals.

Choose an S-Bus connection for all new applications since this is more reliable.



RS 232 on PGU Port (Mode D), not recommended

PCD1	PCD2	PCD4	PCD6	xx7
-	√ (1)	\checkmark	\checkmark	-

(1): not suitable for PCD2.M150 and PCDx.M170

(without assignation of the PGU port, configuration of port 0 as S-Bus PGU port)

Selected PLC type: PCD



RS 232 auf PGU Port (SBus)

PCD1	PCD2	PCD4	PCD6	xx7
~	✓	✓	✓	-

(without assignation of the PGU port, configuration of port 0 as S-Bus PGU port)

Selected PLC type: S-Bus

RS 485 (S-Bus)



PCD1	PCD2	PCD4	PCD6	xx7
✓	\checkmark	\checkmark	\checkmark	-

Assignation of the serial port: SASI S-Bus with the relevant p port number, parity mode as slave, other parameters default values.

Selected PLC type: S-Bus

Termination resistances only if terminal station in the S-Bus network. It is better to use 330 / 150 / 330 Ohm as in the PCD.



RS 232 on PGU Port (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
(√)	\checkmark	\checkmark	\checkmark	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 0, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended, not for PCD1 and PCD2.M150 and PCDx.M170) SASI S-Bus with port 0, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 232 (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
-	-	\checkmark	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with the relevant port number, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with the relevant port number, Mode D slave, other parameters default values. Selected PLC type: PCD



Max. 15 m

Current Loop (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
-	-	~	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with the relevant port number, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with the relevant port number, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 232 on PCD7.F120 (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
~	\checkmark	-	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 1, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with port 1, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 422 (S-Bus or Mode D)

PC	D1	PCD2	PCD4	PCD6	xx7
	-	-	\checkmark	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with the relevant port number, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with the relevant port number, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 232 on PCD2.F520 (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
-	~	I	I	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 2, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with port 2, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 422 on PCD7.F110 (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
\checkmark	\checkmark	I	I	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 1, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with port 1, Mode D slave, other parameters default values. Selected PLC type: PCD

VT-Seite D-Sub 25-poliger Stecker



SPS-Seite

Klemmen

RS 422 on PCD2.F520 (S-Bus or Mode D)

PCI	D1	PCD2	PCD4	PCD6	xx7
-		✓	-	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 3, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with port 3, Mode D slave, other parameters default values. Selected PLC type: PCD



Current loop auf PCD7.F130 (S-Bus or Mode D)

PCD1	PCD2	PCD4	PCD6	xx7
~	✓	-	-	-

Assignation of the serial port:

S-Bus (point to point connection): SASI S-Bus with port number 1, parity mode as slave, other parameters default values. Selected PLC type: S-Bus

ModeD: (not recommended) SASI S-Bus with port 1, Mode D slave, other parameters default values. Selected PLC type: PCD



RS 485 on MPI-Interface

PCD1	PCD2 PCD4		PCD6	xx7	
-	-	-	-	✓	

Type of PLC selected: PCD1/2 xx7

Termination resistances only if terminal station of the MPI network. Make sure the bus is terminated the same way on both ends of the network. Adapt the resistors accordingly if necessary.



Useful accessory for MPI:

Bus connector with PG plug for the simultaneous connection of an MPI network and a programming unit on an MPI interface of an S7 or xx7 PLC.

The connector can be used for intermediate stations (set the switch to off, without termination resistances) and terminal stations (set the switch to on, with termination resistances).

Can be ordered at Siemens, order number 6ES7 972-0BB40-0XA0



Adapter 15 to 25 poles RS 232 (ASP to existing cables for MSP)



Adapter 15 to 25 poles RS 485 (ASP to existing cables for MSP)



Adapter 9 to 25 poles RS 232 (ASP to existing cables for MSP)

Alternative to soldered connection cables

Who doesn't want to create soldered cables can use a shielded 25-poled D-Sub 1:1 cable (maximum length 1 m for RS 485) to connect the terminal to a screw terminal adapter. On the adapter you can add bridges and termination resistors as desired. One possible supplier is Phoenix (price per module about CHF 45.- in Switzerland).

Image below: UM45-D25SUB/S Order number 2962793 (2 levels of screw terminals) Alternative: FLKMS-D 25 SUB/S Order number 2281720(3 levels of screw terminals)



5) Create the first application

Create a new project: Run the PCD8.D81W software, the first screen is for the equivalence of SAIA and ESA designations, klick OK:

SAIA		ESA		
PCD7.D700	UT150W (150W	00000)	
PCD7.D706	UT150W (150₩	000DP)	
PCD7.D710	VT170W (1700	A0000)	
PCD7.D720	VT190W (190W	A0000)	
PCD7.D725	VT190W (190W	AP000)	
PCD7.D730	VT300W (3000	A0000)	
PCD7.D735	VT300W (300M	AP000)	
PCD7.D740	VT310W (310W	A0000)	
PCD7.D745	UT310W (310W	AP000)	
PCD7.D750	VT320W (3200	A00001	
PCD7.D755	VT320W (320W	AP000)	

Select the terminal to program (or select the project under recent if you continue an existing project) A PCD7.D760 which is equivalent to a VT555W AXXXX is selected for this example, confirm with OK.

🛋 New Project		<u>?</u> ×
New Becent		
Order By Name	_	
Name	Description	Hit
VT555W AXXXX	VT	000000
VT565W COLOR	VT	000000
VT565W COLOR (Rev. 4)	VT	000001
<u>ا</u>		
L	<u>DK</u> <u>Cancel</u> ?	

The terminal you selected is shown as follows and you are able to select the PLC the terminal is connected to within the list at the left hand side.

👀 New Project - VTWIN	
<u>File Edit Tools ⊻iew Options ?</u>	
Palette	Project
	VT555W AXXXX_a
CANOPEN	- A MSP
	ASP
MOTION CONTROL	
	FIELD NETWORK
OTHERS	
₽LC	
₽C	
ф• VT	



🕸 New Project - VTWIN	
<u>File Edit T</u> ools <u>View Options</u> ?	
Palette	Project
GE-FANUC	T1555W AXXXX_a
GEFBAN	
HITACHI	- ASP
IDEC IZUMI	
KEYENCE	FIELD NETWORK
KUHNKE	
MODBUS	
OMRON	
PCD	
PCD1/2 xx7	
S-BUS	
SIEMENS	
SPRECHER+SCHUH	
DEVICE	

Select the S-Bus Driver with the left mouse button, keep the button pressed and drag the driver to the MSP port of the terminal:



The program is checking if a driver/unit can be connected to a port of the terminal. If this is not allowed, the connector doesn't get blue.

Always use the S-Bus driver and not the so called PCD driver since the PCD driver can lead to communication interruptions. (??? on the display instead of values).

As the terminal is S-Bus master you could add more drivers/units to the MSP. The S-Bus addresses of the relevant stations can be selected by double clicking on the PLC symbol:

🔟 Device's	parameters	? ×
- Device		
Name	SAIA:S-BUS_a	
Туре	SAIA:S-BUS	
Comment		
Device's pro	perties	
Device addr	ess 0	
Device add	ress (DEC): 0-254	
	<u>DK</u> <u>Cancel</u> ?	

This choice is very important since the addresses have to match with the confuguration of the PCD or no communication will be possible.

Save the application at this state to define it's name:

	Ľ
File Edit Tools View Options 2	
Diet Project	
Save A	
Exit SALAS-BUS_a	
S-BUS	
SIEMENS	
SAIA-S-BUS	

Introduce a file name and select the folder where to store the project, then press Save:



It is important to know that the program consists of two major parts:

- the network configuration part where we have been until now
- the terminal dialogue creation part where we will change to just after this

Regarding the saving of applications there is a property of the current versions you must know:

- **the project is only really saved on disk when you save in the network configuration part**. If you store in the dialogue creation part it seems that it stores as well, but this is not really the case. You must come back to the network configuration part regularly to store there to avoid losses.

Crashes are rare with this software, but according to our experience it is better to **work locally** on the harddisk and to make backups on the network. Most of the crashes we have seen happened to users who worked on projects that were stored on a network server.

Open the terminal dialogue creation part of the software by double clicking the terminal symbol:



₩ VT555₩ AXXXX_a		
Project Iools Configure Window ?		
Project components		
	- Component list	
Mariables Screens Memory areas Exchange areas Information messages Alarms Touch buttons Direct commands Text lists		Add Defete Edit
Image lists Images Macros Pipelines Pirrt pages Reports Headers and footers Trend buffers	Overview	
		2
		+

You can see a screen with the project components. The next step will be to define new components, which means variables, screens and so on.

The terminals support several user languages. Define what languages you want to use by choosing the menu configure, project languages and fonts:

🖷, Project languages	? ×
Language	
T:English ▲dd 및	<u>E</u> dit <u>D</u> elete
Language fonts	Preview
ESA6X8 (ESA 6X8)	0123456789 abcdef9hij
	0123456789
	0120400107
	ABCDEFGHIJ
<u> </u>	01274
Add <u>D</u> elete	01234
Project fonts	
ESA6X8 (ESA 6X8)	Height:8
	<u> </u>
Lancel Apply	1

Add new languages as required. Defining the languages at the beginning allows to introduce the texts in all the languages at a time.

In the same window the font to be used for the language can be defined. If you select true type fonts you need to be aware of the following facts:

- using true type fonts can lead to problems with the maintenance since it is not said that the PC of the service engineer who would like to do a modification has the appropriate fonts installed. Use common fonts (Arial...) and store the fonts used together with the project. For copyright reasons the fonts can't be integrated into the projects automatically.

- if you select true type fonts for one language, this has as well to be done for the other languages (no mixing possible)

Add a couple of variables by choosing the variables component and pressing the Add button:



Define the name, the media and address of the variable:

💐 Project varia	bles					? ×
<u>G</u> eneral options	Limits and linea	r scaling				
Name	Water level				Co	mment
Source	SAIA:S-BUS_a				•	
Data area						
Register		-	Туре	Dword		-
Signed					Г BC	D
- Physical addres	15					
R	2000	_				
Valid range:						
R (DEC): 0 - 40	195					
						7
				1		
	<u>0</u> k	<u>C</u> ancel		2		

Define limits and a linear scaling if required, confirm with OK:

🐃 Project varial	oles	?×
<u>G</u> eneral options	Limits and linear scaling	
- Input limits		
C <u>N</u> one	Constant	
Min		Max
Linear scaling		
C <u>N</u> one	Constant	
Terminal	Min	Max
Device	Min	4095
	<u>D</u> k <u>C</u> ancel	Apply 2

The figures given above lead to the following result:

- Entries of the user are limited to the range 0 to 100
- Values in the register between 0 to 4095 lead to a value displayed of 0 to 100 (of course this scaling can as well be done in the PLC if preferred)

Please note that at this state we don't care about a decimal point that will may be be defined when the variable is displayed. We are interested in the integer value for the moment.

You can continue like this for the other variables. Variables can be added to the project at any time, but it is simpler to define them at the beginning.

Unfortunately there is for the moment no way to import ressources from PG5, which means

- quite a lot of work to redefine the variables that are used on the display, a source of errors
- absolute adresses have to be used
- the symbol names are not automatically the same in PG5 and VTWIN

Hopefully this will be improved with future PG5 versions.

Create a new page by selecting the components screens and clicking on Add:

# VT555W AXXXX_a		
Project Iools Configure Window ?		
Project components		
The components		
Variables		
Screens	<u>Add</u>	
Memory areas	Trelete.	
Information messages	Deper	
Alarms	<u>E</u> dit	
Direct commands	Duellerin	
Text lists	Dupreate	
Image lists Images		
Macros		
Pipelines Print pages	Overview	
Reports		
Headers and footers		
I Trend Durrers		
	?	
		_
	E	+

Define the page and a name, confirm with OK:

, Page identifi	cation			? ×
Identification	lelp page			
Identification				
Page number	1			Comment
Name	Main screen			S
Refresh delay		500 msec	H	

Now you can see the page editor with a graphical representation of the terminal and the available tools:

₩ VT555₩ AXXX_a			_ @ ×
Project Lools Object Fields Edit Page Configur 	e ¥/ndow 2 ▶ (?) ♥ ♥ ♥ ♥ ♥ ♥ ● ● ♥ ● ♥ ♥ ♥ ♥ ▶ □ ○ ♪ ■		
St Page 1	n. 0001	<u>_</u>	
	R.		
Insert multilanguage label		[□] X = 9,Y = 10	

Place a multilanguage field by selecting the relevant icon,

₩ VT555₩ AXXX_a		
Project Iools Object Fields Edit Page Configure Window 2 Dimen X Baller X Win Y M Q D H # ? A R A A' A' B B B B S M D S S M S S M R H M B B B S M S M S M		
\$€ Page n. 0001	<u></u>	
Insert multilanguage label	□ ×= 21, Y = 19	+

then position the cursor on the white face of the terminal and click left:

WT555W AXXXX_a			
Project Iools Object Fields Edit Page 1 Brown M. Carller X X 20 Brown Matter Carles Control	Configure Window 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
8	Page n. 0001	-	
	6		
Inset numeric field			-

Placing new objects at locations where there is enough space at the right hand side is always a good idea. If you don't do this you can end up in a situation where you are not able to introduce the full length of the text since there is no more space left. After placing an object it can easily be moved to the desired location.

Introduce the text in the standard (first language) and press enter:

You now see a window which allows to introduce the translations:

🖷, Translations				? ×
1:English	Water level:	▲ ▼	Fonts ESA6X8 (ESA 6X8)	•
- Translations 2: French	Niveau d'eau:	<u>∧</u> 13	ESA6×8 (ESA 6×8)	-
3:				· //
4:				
5:				✓
6:				
7:				
8:				
	<u>Ok</u> <u>C</u> ancel <u>Apply</u>	2		

If you followed the same example you could see that the translations cannot be longer than the standard text (which is not very nice). What you can do is to cancel, add spaces to the original text and come back to this window pressing enter.

Introduce a numeric field, by selecting the appropriate tool and placing an object on the white screen surface:

U 1555W AXXXX,a Poiert Iools Object Fields Edit Page ■ ■ ■ ■ ¥ Page X ¥ 20 A R A A A A D To Fields ► E HH REL 1 To Field S 20	Contigure Window 2 Contigure Q Q D III ? Contigure Q D D III ? Contigure Q D D D D D D D D D D D D D D D D D D		_IBX
	Numeric field General options Mode Inneshold Name PAGE_0001-FIELD_0002 - Source variable Source Device Variable Water level Display	Comment	
I		Apply 2	

You can define how many digits you would like to display and in the format field you can add "cosmetic" characters like decimal points.

Add a multilanguage text field for the physical unit °C. To place special characters you can **press F12** during the introduction of the text. This allows you to select characters from a table:

٩,	Ext	end	ed I	keyl	boa	rd																		? ×
Г																								
H	E		*	+	-	±	•	0	_	_	ð	Ŷ	_	,J	*	•	4	*	!!	ſſ	\$	-	ŧ	<u></u>
t.	+		+	τ.			-		÷.		#	\$	×	8.	,	¢	>	*	+	,	-		/	
0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	a	A	в	С	D	Е	F	G	
н	I	J	К	L	М	Ν	0	Р	Q	R	s	т	U	Ų	М	Х	Y	z	C	\sim	J	^	-	
N.	а	ь	с	d	е	f	9	h	i	j	k	1	m	n	0	р	9	r	s	t	u	v	ω	
×	У	z	<	1	>	~	۵	ç	ji.	Á	A	ä	à	â	ç	ê	ë	è	ï	î	ì	Ä	Å	
É	æ	Æ	ô	ö	ò	û	ù	ÿ		•		£	¥	Pŧ.	f	á	í	ó	ú	ñ	Ñ	₫	₽	
Ś	•	7	4	4	i.	~	~	10				4	4	4	•	•	4		•	•		4	٦	
L	Ŧ	т	ŀ	-	ŧ	÷	F	•				÷.	-	٠	+		т	Ŧ		•	r		÷	
+	з.	r		-	н.	1	-	CC.				Σ	Q	P	ĩ	₽	θ	Ω	δ		ø	€	n	
=	±	2	≤	ſ	1	÷	#		•	•	J	30	2	•										
								<i>b.A</i> .																
						Ū				<u>C</u> an	cel			Δp	ply				2					

With true type fonts the characters should match with what you have on your keyboard, for the standard fonts to character position is not always the same and wrong characters can be displayed. This often seen in german and french with öäü and éàè. If you use the F12 table the right characters are displayed as well with the standard character sets.

Workshop PCD7.D7xx

If you don't introduce translations for the non-standard project languages, the standard text is copied,

🚔, Translations						?×
1:English	*C			2 ▼	Fonts ESA6X8 (ESA 6X8)	-
Translations						
2: French					ESA6X8 (ESA 6X8)	
3.						
4:						
5:						
6:						▼ 🥢
7:						▼
8:						
	<u>0</u> k	Cancel	Apply	2]	

so if you confirm as shown above °C will be displayed for all project languages.

The result is as follows:

🖩 VT555₩ AXXXX_a			_ 8 ×
Project Tools Object Fields Edit Page Confi	gure <u>W</u> indow <u>?</u>		
	<u> 고 </u>		
	•□ •□ 景 ●● 🖶 🚯		
📧 🛲 ABC 🖫 🖬 📲 🛤 🔢 👟 🌆			
	0001		
Est Pag	e n. 0001	<u> </u>	
	Water level: ###	.#	
	30		
(107,42)-(12,8)	1		+

The objects can now be placed in their final position so the example looks a bit nicer:

W1555₩ AXXX_a Project Tools Object Fields Edit Page Configure Window 2		
A R A C G G G G G G G G G G G G G G G G G G	C R	
ESN VT656W		
(119.29}{12.8}	□ X = 135,Y = 35	•

We are now ready to download our first example into the terminal.

Close the page and select in the menu tools, download project:

₩ VT555₩ AXXXX_a		
Project Tools Configure Window 2 Compile project Convolution project Font editor Backup/Restore Export translations Export translations		
Informations		
	- Component list	
Variables	Page n. 0001	Add
Memory areas Exchange areas	_	Delete
Information message		Edit 1
Touch buttons Direct commands		
Text lists Image lists		
Images Macros		Setup
Pipelines Print pages Reports Headers and footers Trend buffers	- Dverview	
		2
Show online help summary		+

It is only worth choosing the option compile project from the same menu if you want to test whether your project is free of errors. If you choose download and the project needs to be compiled, VTWIN asks for this automatically.

Be careful with the following message: as said before you need to go back to the network configuration area to really save your application to disk.

Project E	ditor			×
٩	Project mo	dified. Do you want to	o update?	
	Ja K	<u>N</u> ein	Abbrechen	

Start the compilation:

FROJECT COMPILER			X
Stop on			
 First step wrong 	C Never	C After	wrong step(s)
Display warnings			
Output			
<u> </u>			
	Stop	<u>S</u> ave outpu	ıt <u>E</u> xit

If everything is fine you shouldn't have errors (but warnings if you didn't define the texts in the other project languages:

PROJECT COMPILE	R			×
Stop on				
First step wrong	C Never	C After	1 wrong step(s)	
✓ Display warnings				
Output				
COMPILING PROJECT F COMPILING PROJECT F COMPILING TOUCH BU COMPILING TOUCH KE COMPILING GRAPHIC 1 COMPILING HEADER P COMPILING FINAL CRC	MAGES FONTS YBOARDS YBOARDS RENDS OINTERS OF GRAPHIC VALUE OF GRAPHIC	IC DATABASE DATABASE		
Total text memory 19660 Total graphic memory 39	8 Byte, Used 1362 Byte 3216 Byte, Used 8170	e (0.692749%), Free 1 Byte (2.077739%), Fr	195246 Byte (99.307251%) ree 385046 Byte (97.922261%)	
ERRORS: 0 WARNINGS: 2				
COMPILATION TERMIN	ATED			•
	<u>C</u> ompile St	og <u>S</u> ave ou	itput Exit	

Click on Exit:

Select the port on your PC and the baudrate used for the download:

📾 DOWNLOADI	ER			×
Communication p	ort			
COM 1	C COM 2	C COM 3	C COM 4	
Baud rate				
O 300	C 2400	C 19200	115200	
C 600	C 4800	C 38400		
C 1200	C 9600	O 57600		
🔽 Update termina	I			
🔲 Update term	inal Fw			
		<u>C</u> ancel		

The baud rate you select has nothing to do with the baudrate used later for the communication with the PLC, so try with 115200.

Before you start the download you need to connect the programming cable and to set the terminal in the appropriate mode to receive a project:

For touchscreens:

Press simultaneously on two diagonal corners of the screen, then select TRAN PAGE to get to the transfer page, select the port to be used for the download.

For terminals with function keys:

Press shift enter, wait for the message "wait for boot forced", then select the port to be used for the download.

After this select OK to start the download:

📾 DOWNLOAD	ER		×
Terminal model	555W FULL	512K Flash	
Boot version	1.1	Boot date	27-10-1999
Sending project			
		90%	
	R		

If the fields of the downloader stay white you don't have a connection to the terminal. Common causes:

- terminal not in the right mode
- programming cable not connected properly
- wrong port on PC used

On certain laptops you can have the problem that the download starts, but stops before it is finished. If this happens close the window, set the terminal in the reception mode again after removing power, start the download again and try step by step with lower baudrates.

Regarding the firmware the terminals are very simple to handle. If VTWIN contains a later firmware version that is available in the terminal, the new version is automatically downloaded. The first download takes longer if this is the case since before the project the new firmware is downloaded.

What you have to do to get the terminal and the PCD talking together:

- make sure the PCD port you indend to use for the link is not configured as S-Bus PGU port (the SASI we will place will be red all the time if this is the case, the full protocol is not required by the terminal)
- configure S-Bus support and select the right S-Bus address
- place a SASI S-Bus Slave FBox with the relevant port number and parity protocol
- the baud rate is 9600 baud as default, which is sufficient. As there is very little traffic on this serial line it is not worth increasing the baud rate
- create or take an appropriate connection cable and connect the PCD to the terminal

If this fails see the FAQ section of this document.

6) FAQ: Frequently asked questions

60% of the support questions can be covered with this document using the hints below. Another large part can be answered with the excellent online help and the manuals.

Compilation error, "sensitive element is overwritten by..." on touchscreens

- two elements with the option edit allowed = on are one above the other or too closed together

Download suddenly stops before it is finished

- normally only happens on certain laptops. The problem was quite common with version 2.xx and 3.xx, but should be seldom with versions 4.xx
- cut the supply of the terminal an put it in reception mode again (see chapter 5 if you are not sure about this)
- close the download window, start the download again and try with the next lower baud rate
- failing this repeat the steps above each time with a lower baud rate

Terminal blocked, cannot be put in the reception mode

- can happen after non-complete firmware downloads
- procedure for touchscreens: find somebody to help you, cut the supply, press the two diagonal corners as usual and stay on it, apply the supply and remove the fingers when the terminal is ready to receive a firmware or project
- procedure for terminals with function keys: cut the supply, press coninuously shift + enter, apply the supply and remove the fingers when the terminal is ready to receive a firmware or project

No communication between the terminal and the PCD (very popular question)

- make sure your customer has this document available
- make sure the right port ASP, MSP has been selected, all the cables in the documentation are for the MSP which is available on all terminals of the series PCD7.D7xx
- make sure the S-Bus driver has been selected in the VTWIN application (if this is not the case assign the port of the PCD with Mode D, slave and the appropriate baudrate)
- if the SASI FBox is red this could be because of an S-Bus PGU configuration of the same port, a baud rate too high together with the baudrate of the other port using the same UART (for instance port 0 and 1 both 38.4k doesn't work, see manuals PCD1+2...), or a hardware problem (port not existing, module missing)
- check the parameters of the SASI FBox. For S-Bus the parameters should be S-Bus parity slave, default 9600 baud or matching with what has been selected in the terminal project
- check the S-Bus address to match with the terminal project
- check the cablework according to the drawings in chapter 4, for S-Bus try to twist the two communication wires
- the problem should be solved at this state since upon now there was never a problem with a terminal regarding this. If you can download your application you have a big chance that the serial port is working

Backlight getting darker and darker with the months and years

 the fluorescent backlights of the graphical terminals are not made to be on all the time. Their life time is limited and you need to program a timeout which turns the backlight off after a while without key presses. Do this in the menu configure, project settings:

, Project setup	<u>? ×</u>
General Alarms Messages	
Edit mode idle time out	30 sec
Start up page	·····
Eeep on screen touch	
Enable screen saver	Delay 30 min
ß	·
When screen saver starts terminal scree	in lamp does off
Which screen saver stats terminal scree	and the goes on
<u>O</u> k <u>C</u> ancel	Apply 2

This should be done for all graphical terminals as default.

7) Open an existing .mdb project

The 2.xx versions of VTWIN did store their projects in the .mdb format. If you want to import such projects into version 4 you can do this in the network configuration area choosing file, open by selecting the file type .mdb.

After this the old project is converted to a .vts file (new standard for single terminal applications). The .mdb file is not deleted but no longer used. You can keep it for backup purposes.



Öffnen			? ×
Suchen in:	🔁 Esa	- 🖻 💆 🖻	
555 Trend 555 W TES 565 S-BUS 565 TEST 565 TEST 565 W MPI	mdb ST.MDB SADR. 2.MDB ALRO.MDB .MDB db	한 AUSSTELLUNG VT150.MDB 한 AUSSTELLUNG VT190.MDB 한 AUSSTELLUNG VT310.MDB 한 AUSSTELLUNG VT555_XX7.MD 한 AUSSTELLUNG VT565.MDB 한 bidon.mdb	ւջ՝լջ՝լջ՝լջ՝լջ՝
•			Þ
Datei <u>n</u> ame:		Ö <u>í</u> fne	n
Dateityp:	*.MDB	Abbrect	nen

8) Define the structure of an application

Before you create an application it is worth drawing a rough structure on paper. A clear structure helps the user significantly to navigate and access the information desired.

8.1) Terminals with function keys

These terminals allow to define sequences of pages, which simplify the work of the programmer and the user. A sequence is a collection of pages which belong together because they are about the same topic, for instance online values, maintenance parameters, clock parameters....).

With version 4 of VTWIN sequences can consist of several pages with page numbers in a line (start / stop sequence, for instance page 1 to 10) or a random sequence (for instance page 1, 3, 5, 2, 10...).

The advantages of the use of sequences are:

- for the programmer: nothing has to be programmed to navigate between the pages of the sequence, the page can be changed using the arrow keys. No space is needed on the screen for the navigation within the sequences
- for the user: simpler to use

To change from one sequence to another a function key has to be assigned with this function. This requires that the meaning of the F-Key has to be put on a label or mentioned on the screen.

Typical structure:



8.2 Touchscreen Terminals

The touchscreen terminals don't allow to define sequences. The programmer decides by placing buttons on the pages what jumps are possible. It is all the same worth the pain to draw a structure on paper before starting.

Typical structure:



9) Exchange areas

For the data exchange between the PLC and the terminal there are several exchange areas available. Remember that for the access to the PLC's ressources no exchange area is necessary.

- Input areas (the terminal is reading): for instance for alarms, info messages
- Status areas (the terminal is writing): for instance for the status of keys or the printer
- Command area (the terminal gets a command from the PLC): for instance set the clock, jump to a certain page

Definition of exchange areas: first step: define a memory area: select the exchange area component and click on Add:

₩ VT555W AXXXX_a Project Iools Configure Window ? ■ 蕭= 『	<u>_[#]</u> ×
Project components Components Variables Screens Memogrades Exchapped seas Finomation messages Alarms Touch buttons Direct commands Text fists Image lists Image lists Images Macros Pipelines Pinipages Reports	Add Delete Edit Dypicate
Headers and footers Trend buffers	2

The exchange areas in a standard PCD are one or more registers, for xx7 a DB. The length of the buffer is always indicated in words (1 word = 16 bit), so two words occupy a register. Consult the table below to know what exchange area size has to be defined:

Exchange area lengths required:

	Туре	Length in words	Number of PCD registers occupied
Input areas	Alarm area	Number of alarms divided by 16	Number of words divided by 2, round up
	Information message area	Number of alarms divided by 16	Number of words divided by 2, round up
Status areas	Command answer area	4	2
	Key status area	4	2
	Print status area	2	1
	Recipe status area	1	1
	Terminal status area	4	2
	Trend status area	1	1
Command area	Command area	4	2

Example for a memory area designed for a command area:

🐃 Project me	mory areas	?	×
Name	Command area	Comment	1
Source	SAIA:S-BUS_a		-
Data area			
Register	▼ Len	gth (WORD) 4	
Physical addre	955		
R	1870		
Valid range: B (DEC): 0 - 4	4095	<u> </u>	
11 (0 2 0), 0			
		•	
	Qk Cancel Apply	2	

 2^{nd} step: define an exchange area that uses the memory area defined before:

🐺 VT555W AXXXX_a	_ @ ×
Project Iools Configure Window 2	
Project components	
Variables Add	
Screens Memory areas	
Exchange areas	
Alams Edit	
Text lists Dyplicate	
Image lists	
Pipelines Overview	
Print pages Reports	
Trend buffers	
2	

Select the desired exchange and memory area, confirm with enter:

💐 Exchange areas					?×
🔽 Enabled	Name	Command	area		Comment
Data area type		,			
C Input area	Function of	command a	ea (4 WORD)	
C Status area					
Command area					
se command died					
Refresh delay	500 msec				
Source memory area					
Source					
Device			•		
Memory area					
Command area (4 WORD)			•	Add	<u>E</u> dit
· · · · · · · · · · · · · · · · · · ·		- 1			
	<u>C</u> anc	el	Apply	2	

Hint for alarm and information message areas: make sure all alarms are in the same area and can be read in one block.

9.1) Alarms and information messages

Alarms and information messages are very similar: on events there are messages made available to the user. All alarms have to be acknowledged and stay visible until the bit assigned to it goes low and the alarm is acknowledged. Information messages disappear automatically when the bit assigned to it goes back to low, whether the user has seen the message or not.

If messages are present this is shown to the user as follows:

- touchscreens: a symbol is automatically displayed at a defineable position
- terminals with function keys: a LED is activated

Both typs of terminals can be configured in a way that the alarm page is automatically shown on each new alarm. This automatism is not possible for information messages.

To each message a bit in the alarm exchange area is assigned. More than one bit can be activated at a time. The user can scroll through the different messages.

Define alarms: First of all an alarm exchange area has to be defined as described in the precedent chapter.

The second step is to define the messages, select the component alarms, click on Add:



Define the text and relevant bit

🐂 Alarm		? X
- Alarm Identifik	ikation	
Name	HochwasserSt1 Kommentar	
Meldungsbere	eich Alambereich Zufügen Editieren	
Bit-Nummer	0 R 1000	
	mfeld Alarm Hilfe Alarmhilfe-Taste Druck ontionen	
- Alarm		
Alarm	Hochwasser Unterstation 1!	
	Dimension X1-Dimension	
Vorschau	Hochwasser Unterstation 1!	
		19
		1922
	X F	
	Qk Abbrechen Angwenden 2	

Alarms and messages already defined can be duplicated. Doing this VTWIN automatically assings the first free bit to the copy, so it is recommended to define the alarms starting from the least significant bit of the exchange area.

9.2) Status area

Status areas inform about the status of the terminal. Using these areas the PLC can for insance see whether a key is pressed on the terminal and what LED's are on.

The online help and the hardware manual explain in detail the status areas of the different terminals. As an example here the first word of the key status area:

		WORD 0									
ВІТ	Shift	VT50	VT60	VT150W	VT160W	VT170W	VT190W	VT300W	VT310W	VT320W	VT330W
0		HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE	HAND SHAKE
1		F1	Help	CirEsc	CirEsc	CirEsc	CirEsc	CirEsc	CirEsc	Cir	Esc
2		F2	-								
3		F3	F3								
4		F4	F4	Enter	Enter		\blacktriangleright				
5		F5	F4	-	-	Enter	Enter	Enter	Enter	Enter	Enter
6		Into	F2	Padn	Pada	PyDn	PgDn	PgDn	PyDn	PgDn	PgDn
7		Help	F1	Patte	Pythe	Pyth	PyUp	Patte	PgUp	PgUp	PgUp
8		F1 _{Esc}	F1	Padn	På	Info	Info	Info	Info	Info	Info
9		F2	F2	Patte	Palla	Help	Help	Help	Help	Help	Help
10		F3	F3	CirEsc	CirEsc	Alarm	Alarm	Alarm	Alarm	Hist	Hist
11		F4	F4	± Space	÷ ± Space	Ack All Ack	Ack All Ack	Ack All Ack	Ack All Ack	Ack All Ack	Ack All Ack
12		F5	:	± Space	± Space	± Spece	t Space	± Space	± Space	t Space	Cir
13		Help	Help	Help	Help			ø	ø		ø
14		Info	Help	Info	Info		-	Spare	Spare	-	Spare
15			-	-	-	shift	shift	shift	shift	shift	Shift

Please note that two different key status areas can be defined

• Key status area:

If a key is pressed, the relevant bit is set and stays high until another key is pressed or it is deleted by the PLC. There is a handshake bit that is always set when one of the keys is pressed. The PLC can reset this bit after having treated the key press and can so detect new key presses.

• Key status area (real time):

If a key is pressed, the relevant bit is high as long as the key is pressed and returns to low when the key is released. As long as any key is pressed the handshake bit is high. As the exchange area is updated in fixed intervals there is a risk of not seeing short keypesses using this status area.

9.3) Command area

The command area can be used by the PLC to give orders to the terminal. The following procedure is recommended:

- check whether the last command was executed (command word 0 equals to 0 if command executed, the terminal resets it after executing a command)
- write the parameters in word 1 to 3
- write the command in word 0
- optionally check whether the command has been executed
- optionally check the command answer area if relevant, not all commands create an answer

The online help and the hardware manual explain in detail what commands are available for what terminal.

The exectution of a command can take up to 1 second even when the communication line is fine, as the command area is interpreted in fixed intervals of 500 ms as default. It can as well happen that the terminal is busy with a higher priority task. The terminal can only handle one order at a time, there is no buffer. An ideal tool to ensure a proper treatment of several commands is the graphtec editor of PG4 or PG5. If the procedure given above is respected, no commands are lost.

Example: Command 16, Set the clock of the terminal with the parameters given

What the command area looks like:

Word	Content
0	16 (command to set the clock)
1	HHMM (Hours and minutes, BCD coded)
2	SS (seconds, BCD coded)
3	Not used for this command

10) Data storage and backup

To be able to modify a terminal project the source code is always required (same as for PCD). The upload and download features only enable to copy projects from one terminal to another without being able to modify them.

Creating backups on a regular basis is of utmost importance!

If you loose days of work because of a crash this is your fault, even though crashes are very rare with VTWIN.

Some hints:

- zip the projects, as they are database files the difference is impressive
- seperate the data from the programs, choose different folders

11) FBoxes for PG4 and PG5

In most of the cases the PLC program does only contain an assignation of the serial port for the dialogue with the terminal.

For advanced features the following FBoxes can avoid programming in instruction list and speed up the programming since they are handy and well tested.

On the other hand you must note that this is not an official FBox library from SAIA, but freeware. You can copy and use it without problems, but we don't gurantee the maintenance of them. It could for instance happen that they are no longer updated with future PG versions.

This is only a short presentation, consult the online help of the FBoxes to know more about them:

D7CheckTim Survey a range of registers for valid time information (useful together with heavac clocks)

D7CheckTim	
En	

D7Command Write a command in the command area



D7CommArea Show the number of the current command in the command area



D7ForceB Force a binary signal



D7ForceF Force a floating value



D7Forcel Force an integer value



D7HeaClkw8 Make the parameters of a HeaClkw8 FBox available to the terminal

D7HeaClkw8

D7Key Show the state of a key

D7Key		
	KPr+	-

D7RdStatus Read the status area

D7RdStatus		
	WD-	_
	EDM-	-
	B2-	-
	B3-	-
	CNV-	-
	B80-	-
	BFU-	-
	SEQ-	-
	PAG-	-
	FID-	-

D7ResKeyHS Reset the handshake bit in the key status area

D7ResKeyHS	
En	

D7SetDate Write the date from the PCD to the terminal



D7SetTime Write the time from the PCD to the terminal



The FBoxes are installed using setup extra files in the PG4 or PG5 group of your start menu.