

**SSD Parvex SAS**

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PARVEX

**How to use the VT150 Operator  
Terminal with DIGIVEX Motion  
User and commissioning manual**

**PVD 3551 GB – 01/2003**



# PRODUCT RANGE

## 1 - « BRUSHLESS » SERVODRIVES

### TORQUE OR POWER RANGES

- **BRUSHLESS SERVOMOTORS, LOW INERTIA, WITH RESOLVER**  
 Very high torque/inertia ratio (high dynamic performance machinery):
  - ⇒ NX -HX - HXA
  - ⇒ NX - LX
 High rotor inertia for better inertia load matching:
  - ⇒ HS - LS
 Varied geometrical choice :
  - ⇒ short motors range HS - LS
  - ⇒ or small diameter motors : HD, LD
 Voltages to suit different mains supplies :
  - ⇒ 230V three-phase for «série L - NX»
  - ⇒ 400V, 460V three-phase for «série H - NX»
- **"DIGIVEX Drive" DIGITAL SERVOAMPLIFIERS**
  - ⇒ SINGLE-AXIS DSD
  - ⇒ COMPACT SINGLE-AXIS DLD
  - ⇒ POWER SINGLE-AXIS DPD
  - ⇒ MULTIPLE-AXIS DMD
- "PARVEX Motion Explorer" ADJUSTING SOFTWARE

0,9 to 320 N.m  
0,3 to 54 N.m

3,3 to 31 N.m

3,3 to 31 N.m  
9 to 100 N.m

## 2 - SPINDLE DRIVES

- **SPINDLE SYNCHRONOUS MOTORS**
  - ⇒ "HV" COMPACT SERIES
  - ⇒ "HW" ELECTROSPINDLE, frameless, water-cooled motor
- **"DIGIVEX" DIGITAL SERVOAMPLIFIERS**

From 5 to 110 kW  
up to 60,000 rpm

## 3 - DC SERVODRIVES

- **"AXEM", "RS" SERIES SERVOMOTORS**
- **"RTS" SERVOAMPLIFIERS**
- **"RTE" SERVOAMPLIFIERS** for DC motors + resolver giving position measurement

0.08 to 13 N.m

## 4 - SPECIAL ADAPTATION SERVODRIVES

- **"XD" SERVOMOTORS** for explosive atmosphere
- **"AXL" COMPACT SERIES SERVOREDUCTERS**

0.7 to 20 N.m  
5 to 700 N.m

## 5 - POSITIONING SYSTEMS

- **Numerical Controls « CYBER 4000 »** 1 to 4 axes
- **"CYBER 2000" NC** 1 to 2 axes
- **VARIABLE SPEED DRIVE - POSITIONER**
  - ⇒ SINGLE-AXIS DSM
  - ⇒ POWER SINGLE-AXIS DPM
  - ⇒ MULTIPLE-AXIS DMM
- **ADJUSTMENT AND PROGRAMMING SOFTWARE** PARVEX Motion Explorer

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Characteristics and dimensions subject to change without notice.

**YOUR LOCAL CORRESPONDENT**

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## 1. DESCRIPTION OF OPERATOR TERMINAL

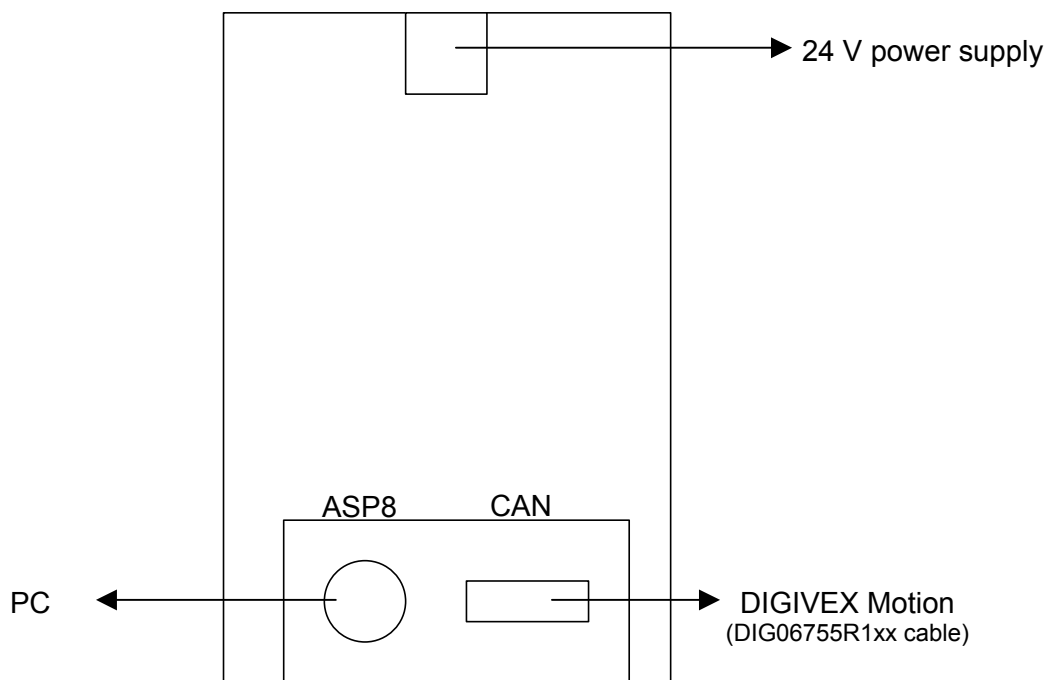
- Green, backlit LCD display with 4 lines of 20 characters
- Dimensions (width, height, depth):  
148 x 188 x 46 mm
- Dimensions of the screen: 75 x 25 mm
- Height of the characters: 5 mm
- Password management
- Integer variable management
- CANopen bus up to 1 Mb/s
- PC programming software
  
- Operator Terminal reference: DVT150C
- Software reference + cable + user manual: DVTWINKITF



## 2. CONNECTING THE OPERATOR TERMINAL AND DIGIVEX MOTION

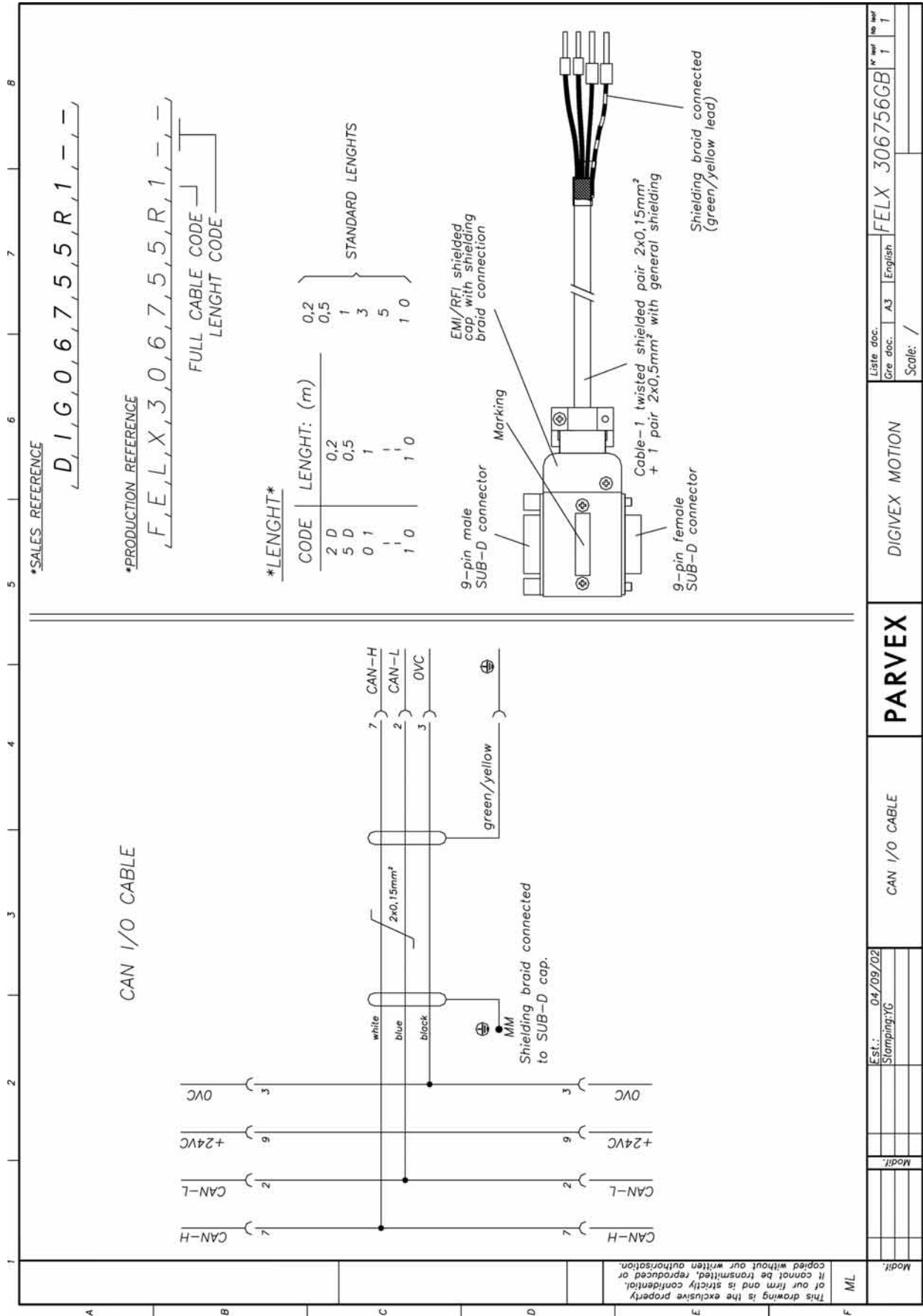
Different connections can be accessed from the rear panel of the Operator Terminal:

- RS232 serial link with a PC: this is used to load a project in the Operator Terminal; use the PC-male, ASP-8 adapter cables supplied with the DVTWINKITF pack
- CANopen link: 5 terminal, removable terminal block for linking to DIGIVEX Motion; use the Parvex cable reference DIG06755R1xx (xx length in metres)
- Power supply: 4 terminal, removable terminal block for a 24V DC (18..32V/15W) power supply



Rear view of the Operator Terminal

# How to use the VT150 Operator Terminal with DIGIVEX Motion



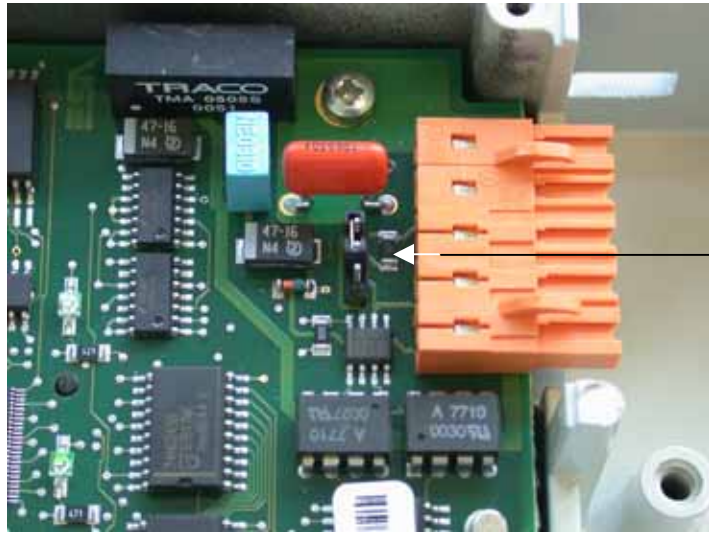
## 2.1 Terminal resistor

A 120 ohms resistor has to be inserted at each end of the CAN bus so that the line can be adapted.

This resistor is built-in to the VT150 Operator Terminal.

A strap is used when required to adapt the bus to 120 ohms in accordance with the other nodes present on line.

Position the strap as shown in the photograph below to adapt the line.

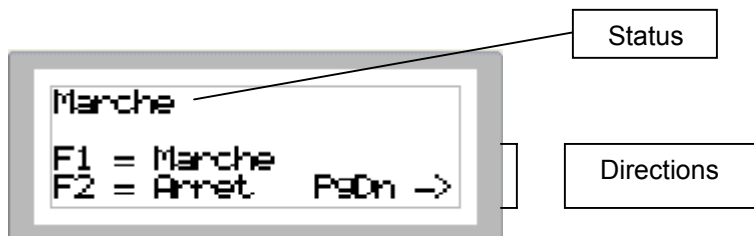


## 3. PROJECT DESCRIPTION

The purpose of this project is to describe step by step how to carry out a simple application involving a VT150 Operator Terminal and DIGIVEX Single Motion (DSM).

The project comprises two display units which are used to authorize motor running from the VT150 on page 1; then, to select a speed set point, and read the measured speed of the motor via the DSM on page 2.


### 3.1 Page 1 description



"On" or "Off" status displayed in accordance with the status of the ui0 variable

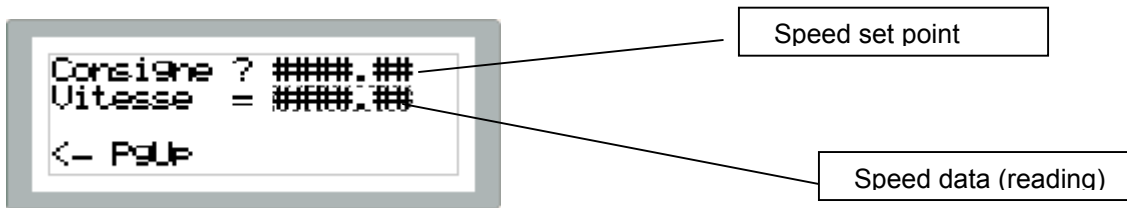
Pressing the F1 function key sets the DSM ui0 variable to 1 (On)

Pressing the F2 function key sets the DSM ui0 variable to 2 (Off = Zero speed)

Pressing the  key gives access to Page 2


## 3.2 Page 2 description

---



The "Speed set point" field is used to key in a speed set point which is transmitted to the DSM (ui1 variable)

The "Speed data" field is used to display actual speed data (speed1) after formatting by the DSM (ui3 variable = speed1 \* 100)

Pressing the  key gives access to Page 1

## 3.3 Implementation with a DSM

---

### 3.3.1 Data exchange

Data exchange with DIGIVEX Motion is conducted by the successive reading and writing of the terminal.

The terminal is an SDO customer. This means that it is the terminal which carries out the requests for reading and writing concerning the other subscribers. These are, therefore, passive in the data exchange process. DSM drive programming is therefore easier as it is not necessary to provide an automatic analyzer program for data transfer management. Furthermore, data is only requested when it is displayed, thus limiting the throughput on the CAN bus.

Remark: In order for it to work, communication between the DSM and the terminal must be conducted on a channel other than channel 0. To this aim, it is not the physical address of the DSM that is given, but their physical address + 64 if 2 SDO servers have been selected (SDO\_server = 0) or their physical address + 32, + 64 or + 96 if 4 SDO servers have been selected (SDO\_server = 1)

If SDO\_server = 0 and if the DSM physical address is 1, a DSM address of 1 + 64 = 65 is given in the software.

If SDO\_server = 1 and if the DSM physical address is 1, a DSM address of 1 + 32 = 33 or 1 + 64 = 65 or 1 + 96 = 97 is given in the software.

### 3.3.2 Integer/Floating conversion

The terminal successively reads and writes DSM variables during data exchange with a DSM.

No specific program is required in the DSM except, where necessary, to ensure an integer to floating, or, a floating to integer conversion as the terminal is not capable of managing floating variables.

### 3.3.3 Conversion program example

The following program is an example of a DSM automatic analyzer PLC2 program which is used to convert the floating *speed1* variable to an integer *ui3* variable. Before the conversion, the *speed1* variable is multiplied by 100 so that the terminal can display the speed using two significant figures after the decimal point. The terminal, in turn, reads the *ui3* variable cyclically and uses the #####.## format for its display.

Example: *speed1* = 123.4567 → *ui3* = 12345 → display = 123.45

The same task is performed in reverse using the *ui1* variable (speed set point).

```
%PROG0
```

```
#INIT
```

```
    ui0 = 2           ; type of instruction
    uf1 = 0           ; speed set point
    PLC2 = PROG2
    DEFPLC2 = 100
    PLC2 = START
```

```
#START
```

```
    drive_mode = 1

    IF ui0 = 1 THEN
        speed_value = uf1
    ELSE
        speed_value = 0
    ENDIF

    GOTO #START
```

```
%ENDPROG
```

```
%PROG2
```

```
    ; read speed set point
    uf2 = FLOAT(ui1) / 100
    uf1 = uf2

    ; write actual speed
    uf3 = speed1 * 100
    ui3 = INT(uf3)
```

```
    END
```

```
%ENDPROG
```



## 3.4 Project writing

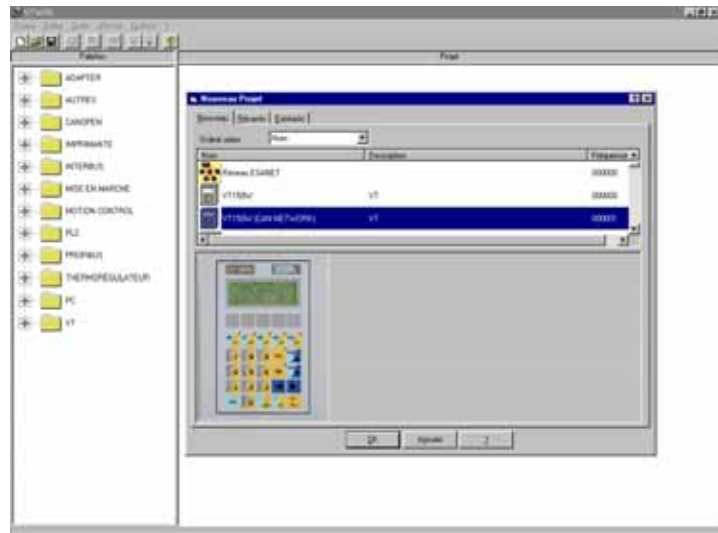
### 3.4.1 Initialization

The project is created using VTWin 4.50 software.

click on the desktop VTWin icon




- select "VT150W (CAN NETWORK)" from the active window, then validate using



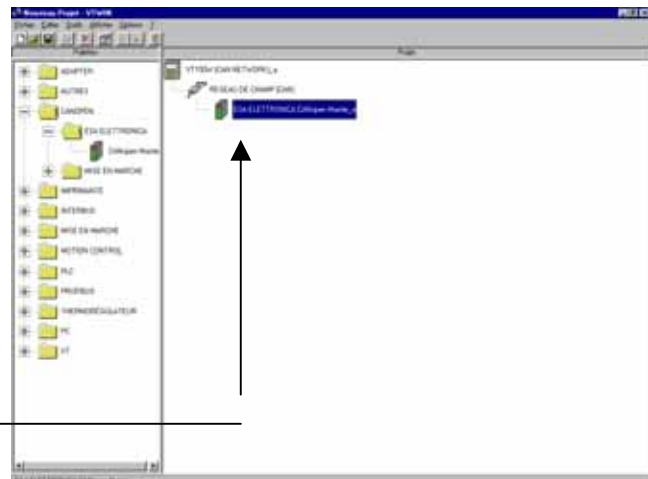
- select the object  CANopen Master in the file:



- drag it across to  RESEAU DE CHAMP (CAN) in the right-hand section of the screen

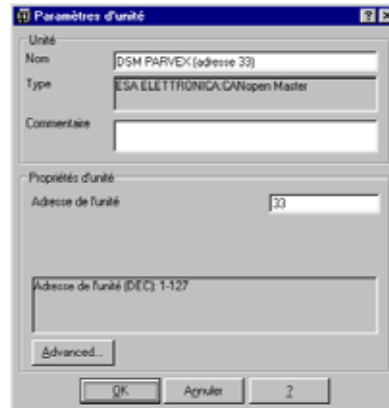
- a new object is created

- this object takes the name

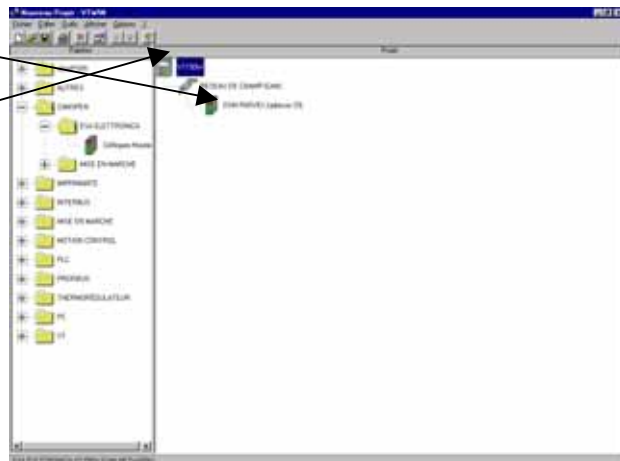


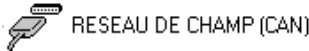
## How to use the VT150 Operator Terminal with DIGIVEX Motion

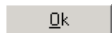
- click on this object and select "Editor / Properties" from the menu to modify its name and CAN subscriber number
- in the "Name" field give for example "DSM PARVEX (address 33)"
- in the "Unit address" field give the address of this DSM: 33 (33=1+32 for an SDO\_server = 1)



- It now reads "DSM PARVEX (address 33)"
- Select "VT150W (CAN NETWORK)\_a", and with a right-hand click, change the name to "VT150W"

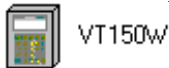


- select the object  

- double click on this object or use the "Properties" menu (right-hand click on the mouse)
- set the transmission speed to 1000 kbit/s then validate using



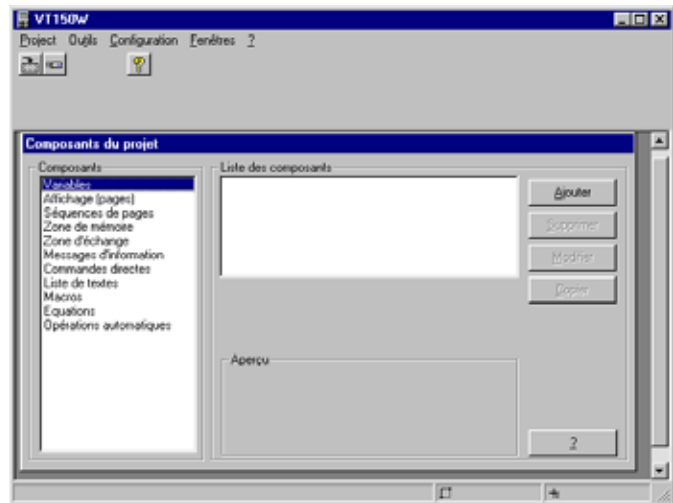
## How to use the VT150 Operator Terminal with DIGIVEX Motion

- select the object



VT150W

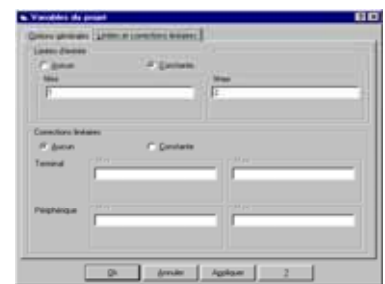
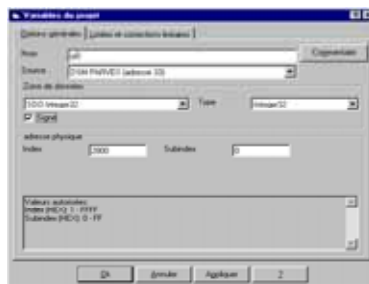
- double click on this object or select "Editor / Editor" from the menu area
- the following window will appear:



- select **Variables** and click on **Ajouter**

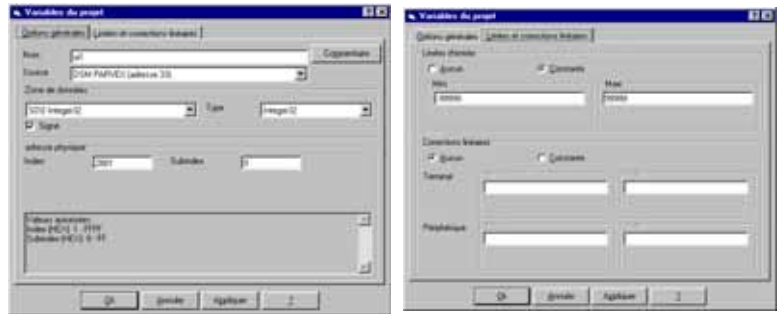
- define all the DSM variables that the terminal is to read or modify
- select the variable type from the "Data area"
- "Index" and "Subindex" correspond to the index and sub-index numbers of the DSM variable selected from "Source" (hexa values)

- ui0 = 32-bit integer variable
- minimum = 1 (On)
- maximum = 2 (Off)

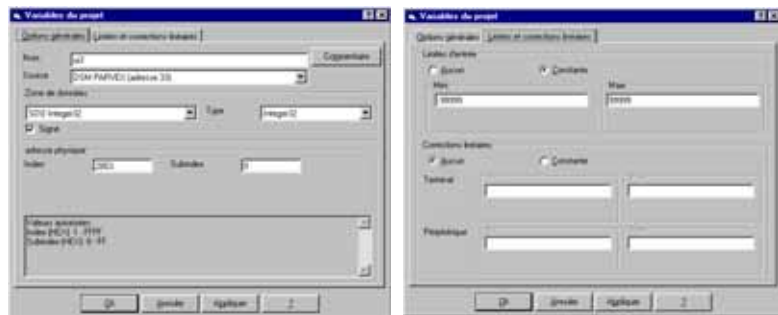


## How to use the VT150 Operator Terminal with DIGIVEX Motion

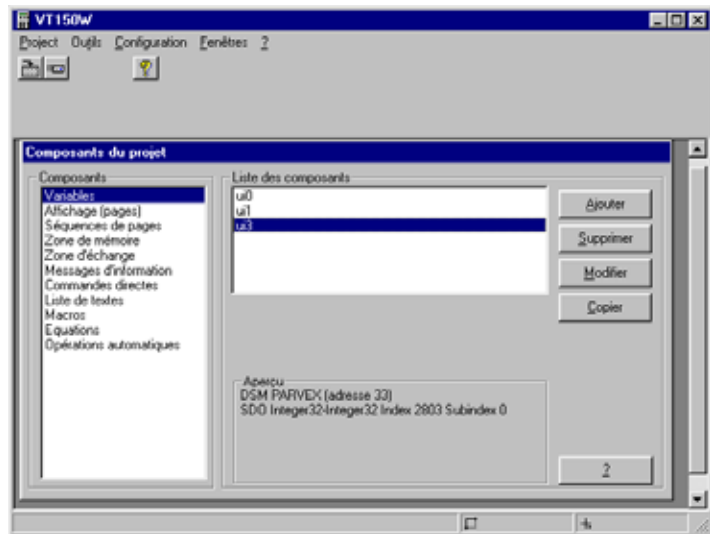
- ui1 = 32-bit signed integer variable
- minimum = -99999
- maximum = 99999



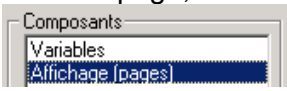

- ui3 = 32-bit signed integer variable
- minimum = -99999
- maximum = 99999




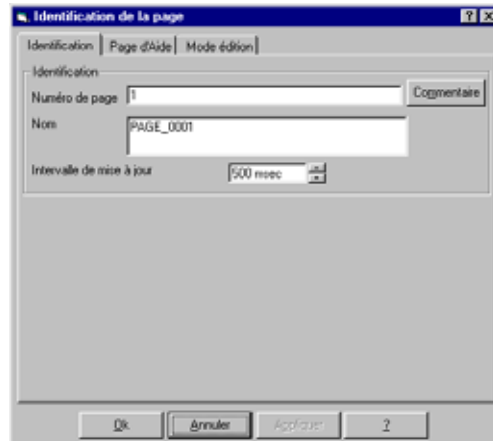
- the 3 variables created will appear in the list of components





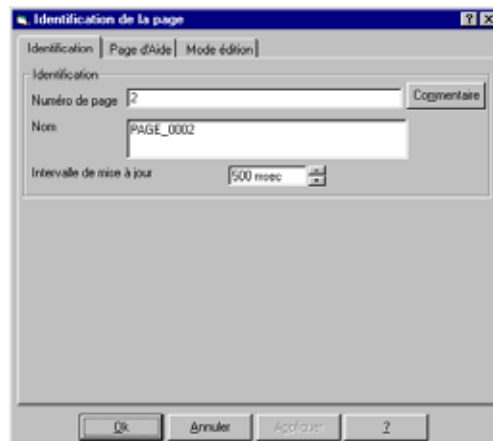
## 3.4.2 Page creation

- to add a page, select  and click on 

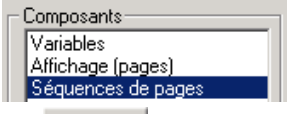
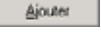
- create **Page 1**
- the time interval between page refresh operations is, by default, 500 ms
- validate using 



- click on  again
- create **Page 2**
- validate using 

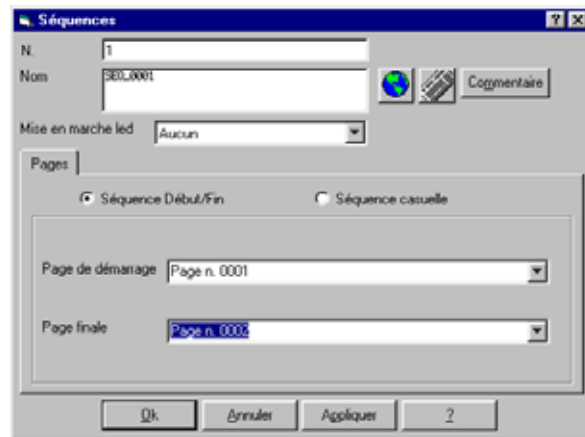


- the 2 pages thus created must be consolidated in one sequence

- to add a sequence, select  and click on 

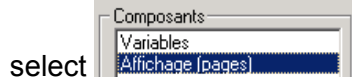
## How to use the VT150 Operator Terminal with DIGIVEX Motion

- select "Beginning/End sequence"
- complete "Final page" = Page n.0002
- the sequence thus created comprises 2 pages: Page 1 and Page 2





### 3.4.3 Editing Page 1

- to edit the contents of Page 1,



select

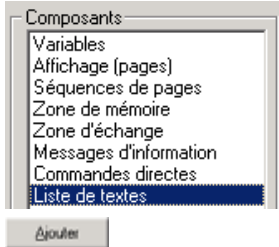
- click on Page n.0001
- click on 
- to display a set text, select 
- click in the required place on the image of the screen, enter the text then validate using "Return"
- this page comprises 3 distinct texts






## How to use the VT150 Operator Terminal with DIGIVEX Motion

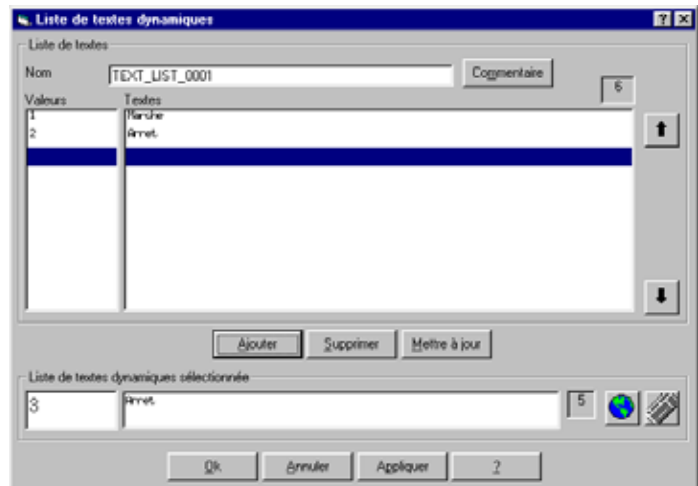
- Page 1 comprises a "Dynamic field"
- before displaying a message field on an integer, it is necessary to create a "List of texts"

- select




and click on

- in the "List of selected dynamic texts" area, edit the message "1 On", click on 
- edit the message "2 Off", click on  then 



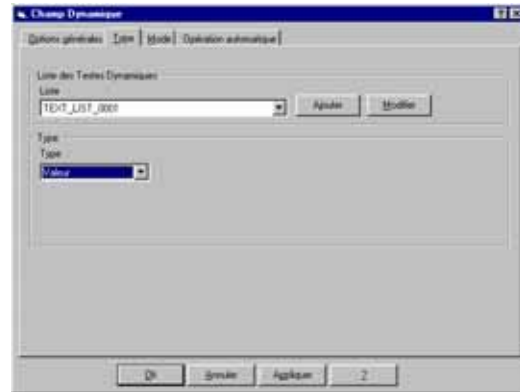
- select  then page 1

- select 
- click in the required place on the image of the screen
- the following window is displayed:
- give the name of the ui0 variable which is associated with the "List of texts"

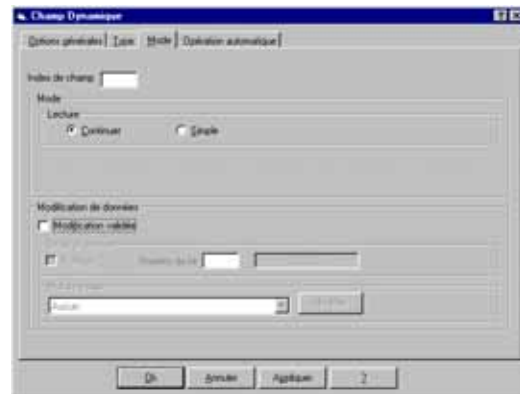



# How to use the VT150 Operator Terminal with DIGIVEX Motion

- select the "Type" tab
- select the "List of texts"
- select "Value" in the "Type" area



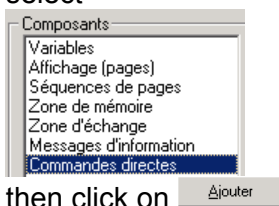
- select the "Mode" tab
- remove the check from the "Modification Validated" cell to show that it is a display area and not an input field



- validate using , the following screen is displayed (the first message on the list is displayed)




- it is possible to modify the ui0 variable with a predetermined value by pressing the F1 and F2 function keys
- this functionality is programmed by use of a "Direct instruction"
- select

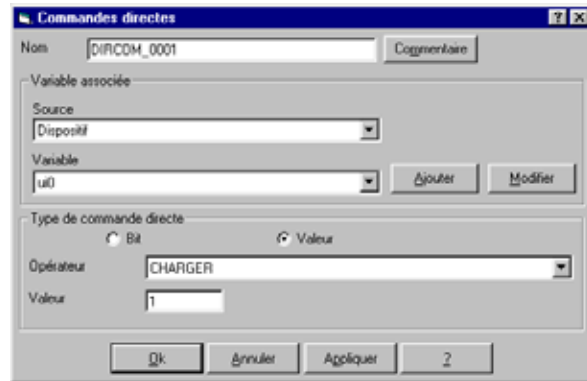




then click on

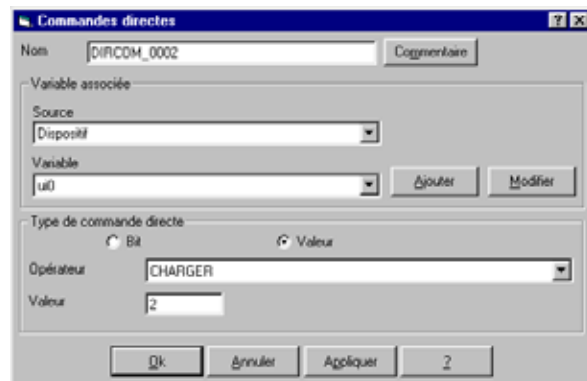


## How to use the VT150 Operator Terminal with DIGIVEX Motion

- the DIRCOM\_0001 instruction is used to assign the value 1 to the ui0 variable
- validate using 





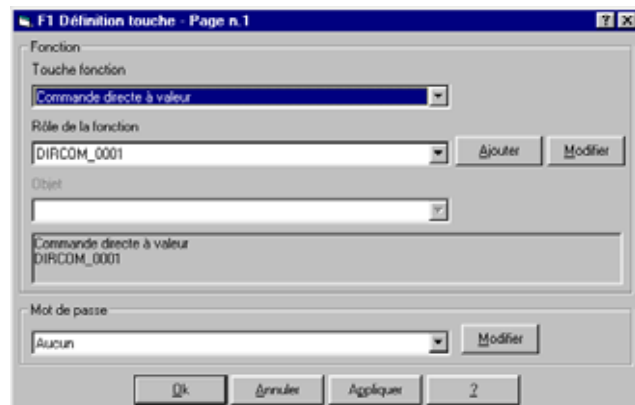
- click on  again
- the DIRCOM\_0002 instruction is used to assign the value 2 to the ui0 variable
- validate using 





- select  then Page 1

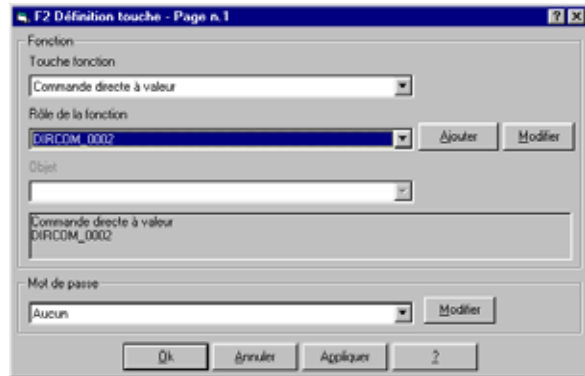
- click on 

- select the F1 key  (click on the yellow area)
- assign the DIRCOM\_0001 "Direct instruction" to the F1 key
- validate using 

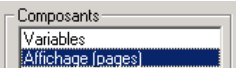





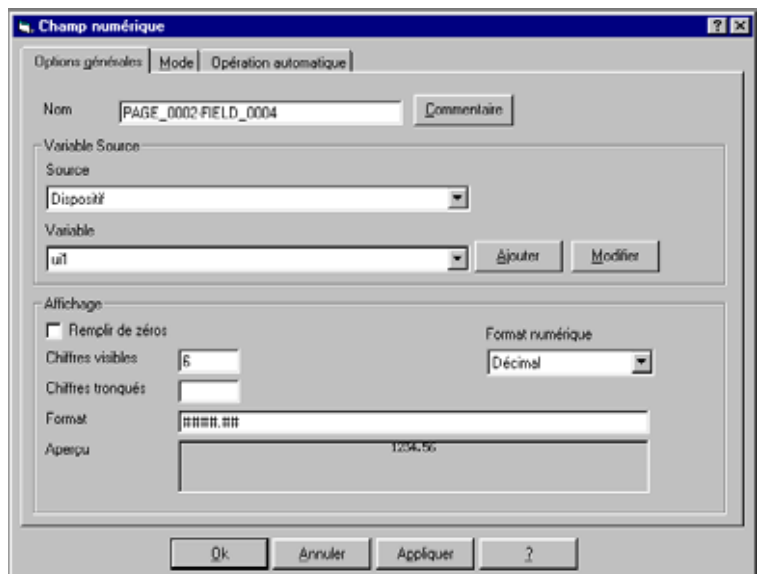
# How to use the VT150 Operator Terminal with DIGIVEX Motion

- select the F2 key  (click on the yellow area)
- assign the DIRCOM\_0002 "Direct instruction" to the F2 key
- validate using 



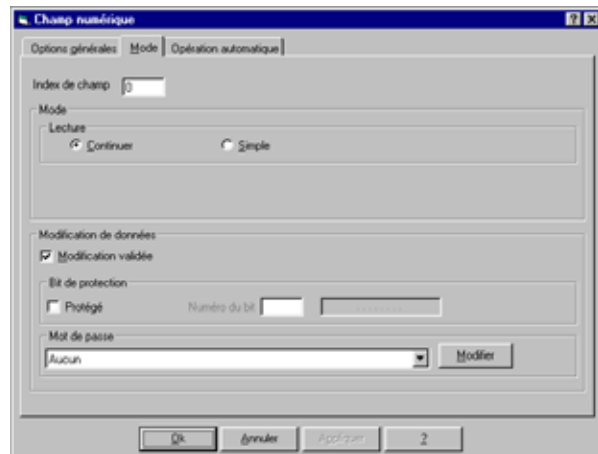
## 3.4.4 Editing Page 2


- select 
- click on Page n.0002 then on 
- to display the set texts, select 
- click in the required place on the image of the screen, enter the text then validate using "Return"
- this page comprises 3 distinct texts
- to display the input field (setting up of a "numeric field" in write mode), select 
- click in the required place on the image of the screen
- the following window is displayed:
- give the variable to be modified (ui1) in the "Variable" field
- give the number of useful figures in the "Visible figures" field
- integrate a "." in the format (#####.###: if ui1 = 100 then display = +001.00, if ui1 = -100 then display = -001.00, the first # is used to display the sign)




## How to use the VT150 Operator Terminal with DIGIVEX Motion

- select the "Mode" tab
- check the "Modification validated" cell to show that it is an input field



- validate using , the following screen is displayed:



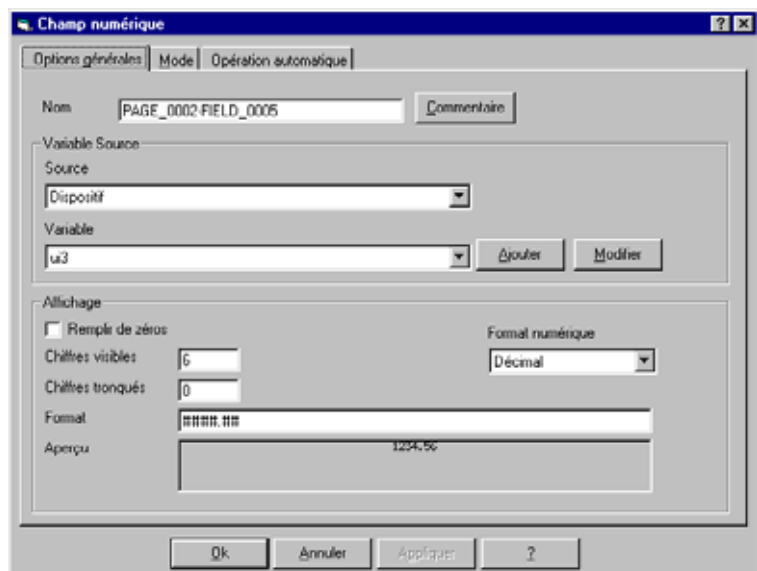
- to display a value (setting up of a "numeric field" in read mode), select 

- click in the required place on the image of the screen

- the following window is displayed:

- give the variable to be displayed in the "Variable" field (ui3)

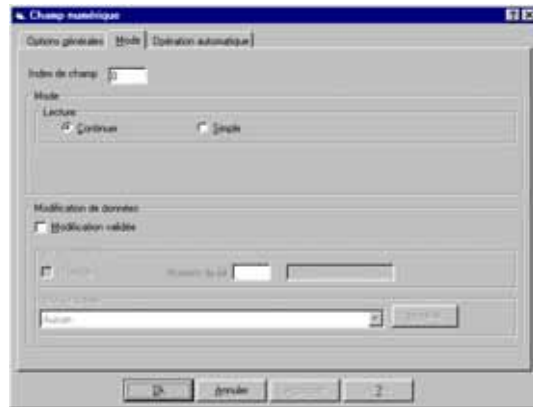
- give the number of useful figures in the "Visible figures" field

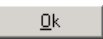


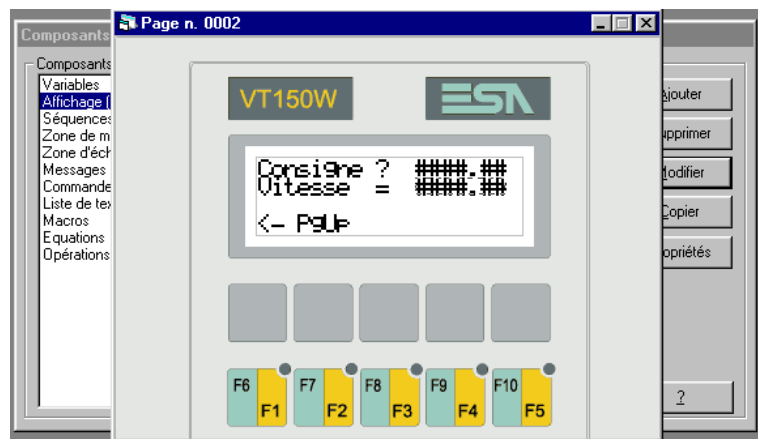
integrate a "." in the format (####.##: if ui3 = 100 then display = 1.00, if ui3 = -100 then display = -1.00, the first # is used to display the sign)

## How to use the VT150 Operator Terminal with DIGIVEX Motion



- select the "Mode" tab
- remove the check from the "Modification validated" cell to show that it is a display area and not an input field

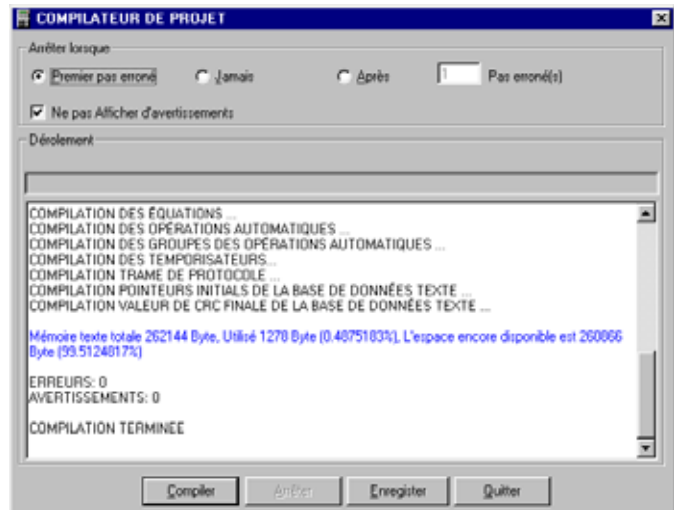





- validate using , the following screen is displayed:


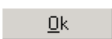


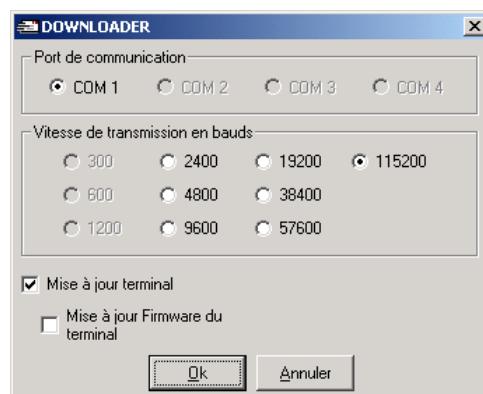
### 3.5 Transferring the project to the Operator Terminal

- before a project is transferred from the PC to the terminal, it has to be compiled
- compile the project by clicking on 
- a window will open and give the compilation result
- close this window by clicking on 



- if the terminal is turned off, turn it on and hold down the  key
- if the terminal is turned on, hold down the  and  keys at the same time
- the information "Boot forced" is displayed on the terminal screen

- check that the terminal is connected to the PC by the serial link cable
- click on  then , to transfer the project to the terminal (it is possible to modify the serial link configuration)





- the project is loaded and the terminal changes to operational mode



## 4. ADDITIONAL INFORMATION ON HOW TO USE THE OPERATOR TERMINAL





### 4.1 Changing the page

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- to change from Page 1 to Page 2 and vice versa, use the  and  keys as required

### 4.2 Value input

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- if necessary, select the input field using the  and  keys (this operation is not necessary if there is only one input field on the active page)
- press the  key to authorize the change to data insert mode
- modify the value of the numeric variable using the numerical keys
- validate using  or, in the event of an error, cancel using 