



Knowledge Base Document

Technical Support Department, U79, Newtown

Title: ESA HMI RS485 to CTNet routing communications protocol

Document Category: General

Product Category: Communication

Credits Jose Garcia

Revision History

Revision	Date	Revising Author	Released for Website ?	Mark X	Authorised By	Comments
1.0	March 05	Jose Garcia	CTSupport CTVip Both None			

Summary of Contents

The Italian manufacturer of HMIs, ESA, has developed a communications protocol that allows access to different Unidrive SP parameters using an extension of CT Modbus protocol.

The main advantage of this is that parameters from different drives can be accessed from the RJ45 port of the Unidrive SP that works as a "routing drive".

The current document shows the user how to configure the ESA HMI terminal in order to access parameters from 3 different Unidrives SP.

Hardware/Software requirements.

- 3 SM-Applications modules with system file version 1.03.04 or higher.
- 3 Unidrive SPs with firmware version 1.07.01 or higher.
- 1 CT Serial Communications Lead (Part Number: 4500-0087).
- CTNet connection between the 3 SM-Applications.
- VT50 HMI terminal. (ESA HMI)
- VTWIN 4.75 or higher (ESA configuration software).

Step-by-Step guide.

[1. Hardware Overview.](#)

[2. Setting communications parameters in the drives.](#)

[3. Configuring the HMI.](#)

[Appendix: Pin-Outs.](#)

1. Hardware Overview.

1.1 Set 3 Unidrive SPs with 3 SM-Applications modules linked through CTNet, as per figure 1.

1.2 Connect the VT50 ESA HMI to Unidrive SP1. See appendix at the end of this document for pin-out information.

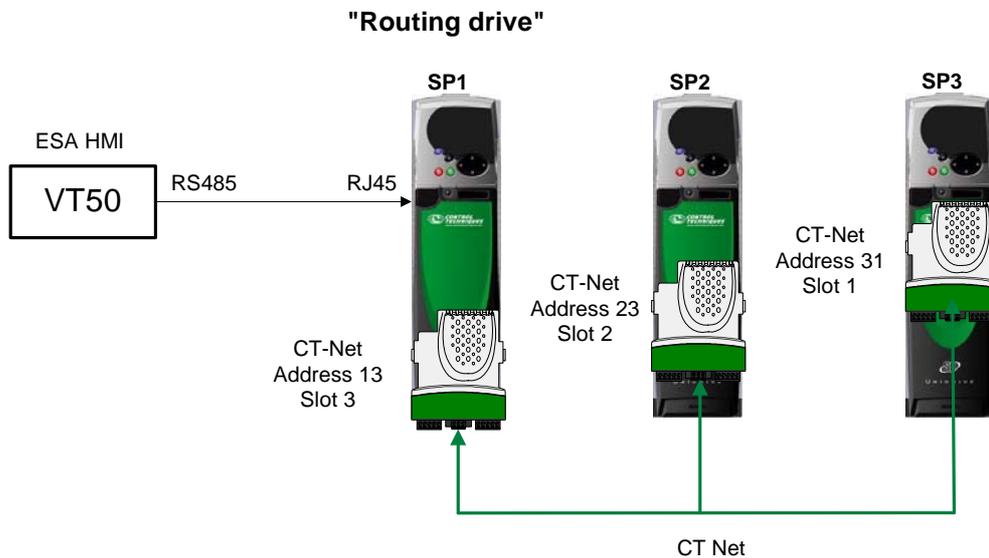


Fig. 1. Hardware overview.

2. Setting communications parameters in the drives.

2.1 The parameters to configure in the drives are shown in Table 1.

Table 1

Parameters	Description	SP 1	SP 2	SP 3
#11.23	Serial address	1 (default)		
#11.24	Serial Mode	RTU (default)		
#11.25	Baud Rate	19200 (default)		
#15.23	CTNet addr. Slot1			31
#15.24	CTNet Baud Rate			2500 (default)
#16.23	CTNet addr. Slot 2		22	
#16.24	CTNet Baud Rate		2500 (default)	
#17.23	CTNet addr. Slot 3	13		
#17.24	CTNet Baud Rate	2500 (default)		

3. Configuring the HMI.

3.1 Open VTWIN .

3.2 From the *Project selection Screen* choose VT50(Rev. 2) and click OK (see Fig. 2)

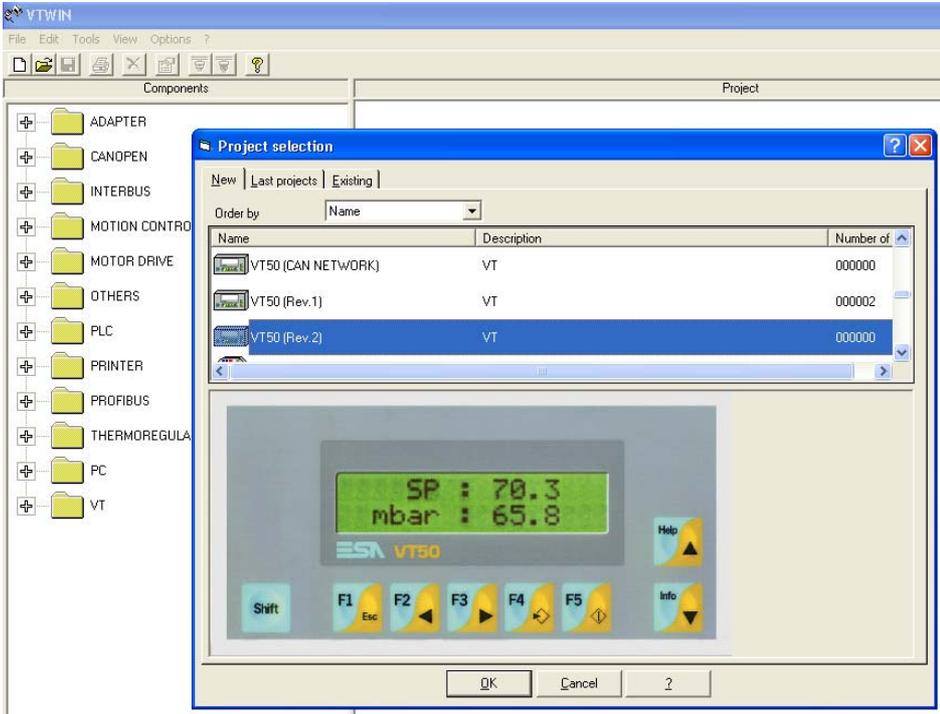


Fig.2.

3.3 From the next screen that comes up, double-click on the MOTOR DRIVE folder, then on the CONTROL TECHNIQUES folder. Highlight the CT Modbus protocol (see Fig. 3)

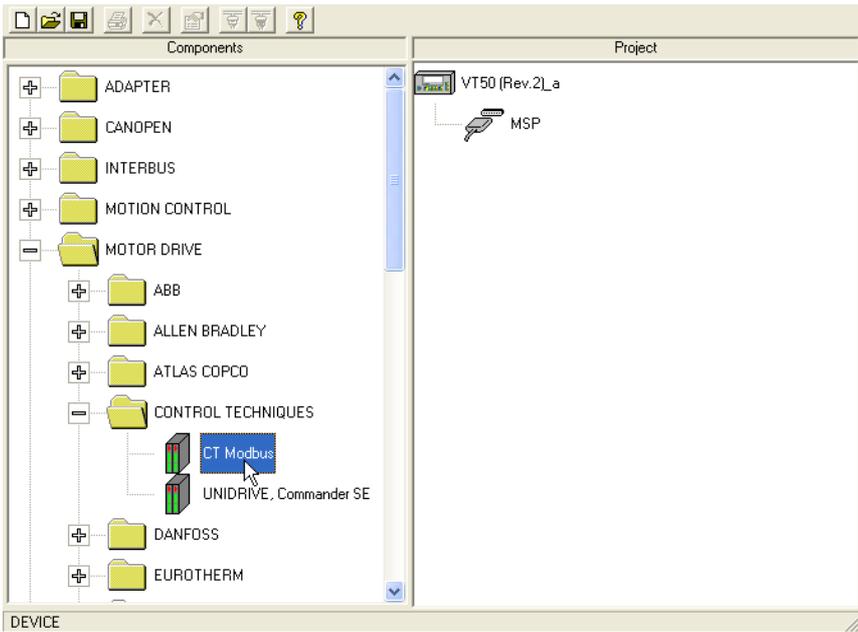


Fig.3.

3.4 Using the mouse, drag the CT Modbus icon up to the MSP port. When the mouse button is released, the CT Modbus protocol will be attached to the MSP port, hanging underneath. See Figs. 4 and 5.

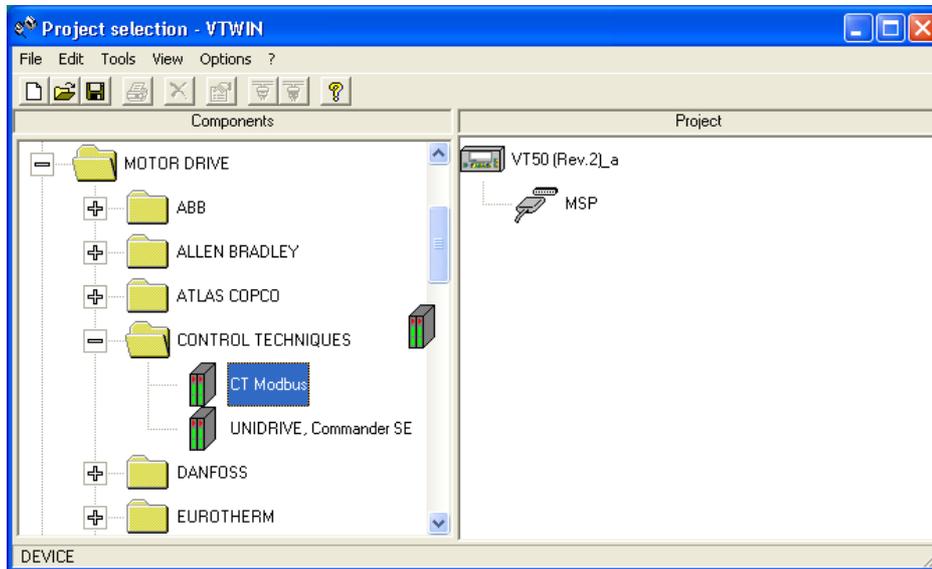


Fig.4.

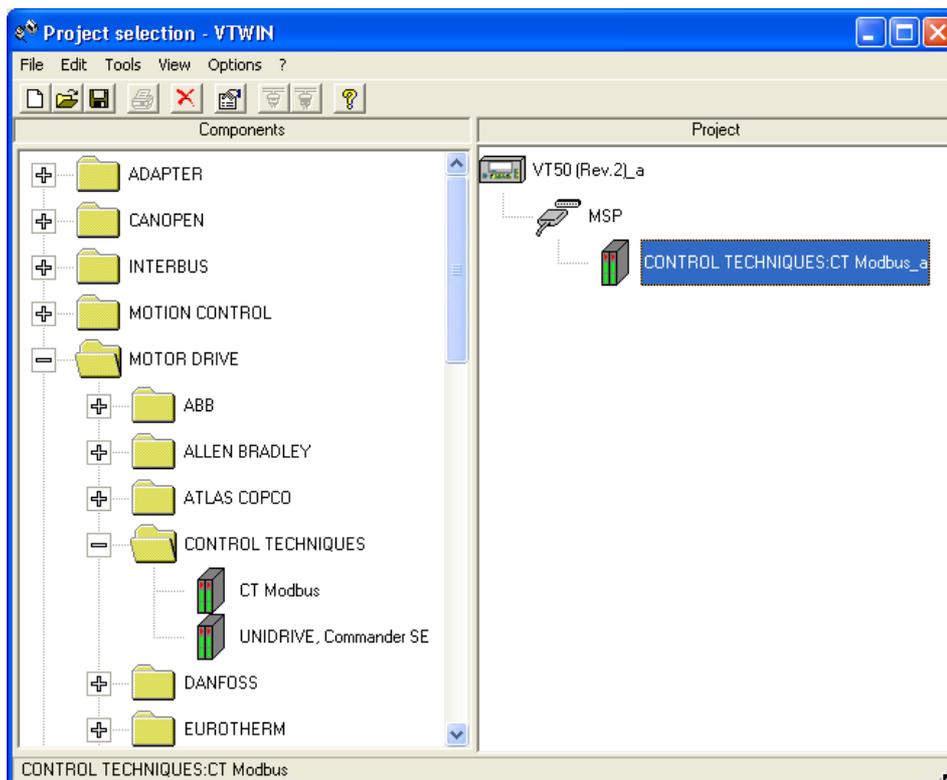


Fig.5.

3.5 In order to better understand the “routing capability” within this article, it makes sense to rename the “*CT Modbus_a*” protocol already created as “CT Modbus SP1 Routing drive” for example. To do this, right-click with the mouse and choose the Rename option. The result is shown in Fig. 6

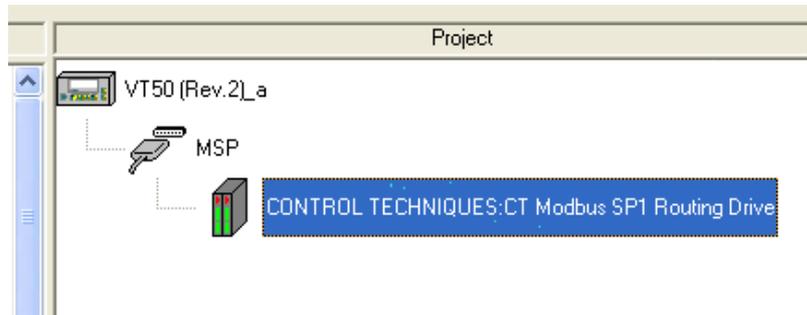


Fig.6.

3.6 Double-click on the previous highlighted protocol. The Device Properties window will come up. On the comment box, something meaningful can be written. On the *Device Address* field, the SP RS485 Serial address must be introduced (Pr. 11.23). In this article, SP1 is referred as the SP with serial address number 1. See Fig. 7.

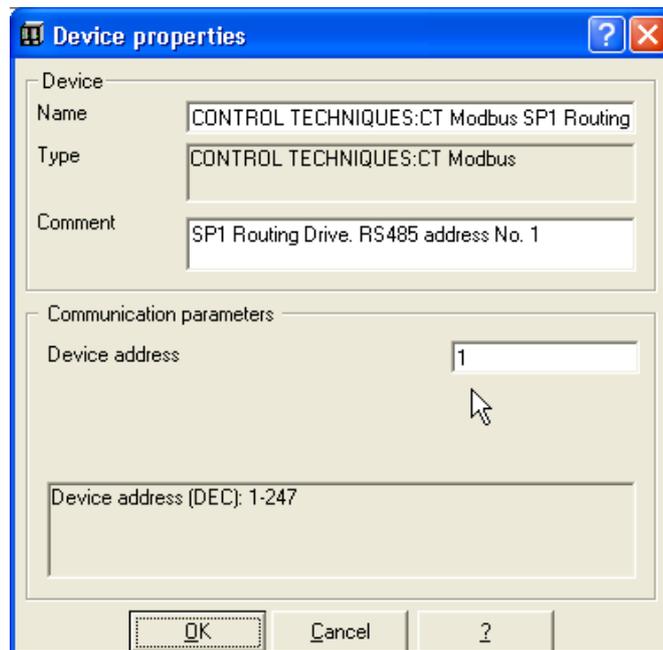


Fig. 7.

3.7 Highlight the MSP port. Double-click on it. The *Port Properties* window will come up. The Communications parameters are set by default for the Unidrive SP apart from the Baud Rate that will be set to 19,200 bit/s. See Fig. 8.

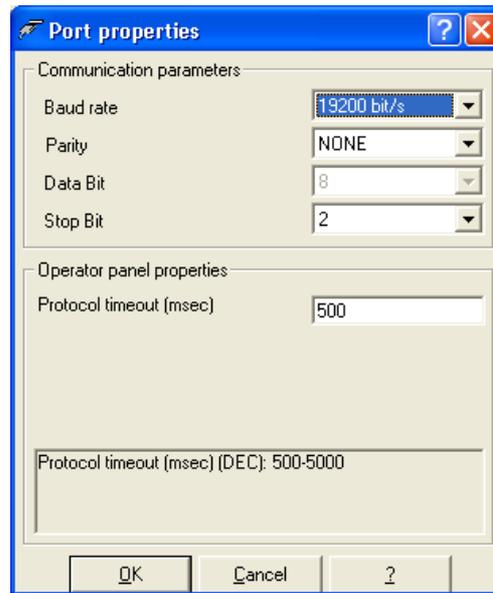


Fig. 8.

3.8 Highlight the VT50 icon and double click on it, the *Project Components* window will come up. See Figs. 9 and 10.

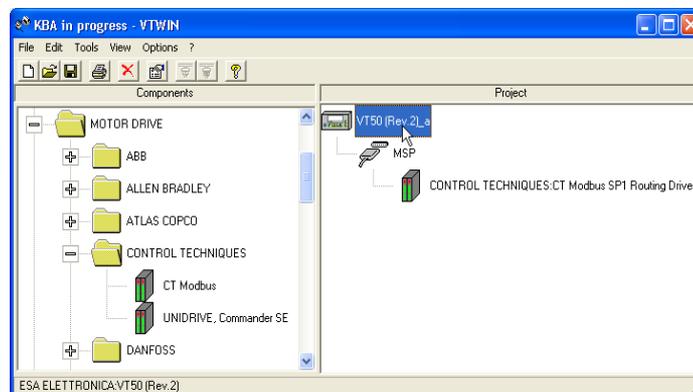


Fig. 9.

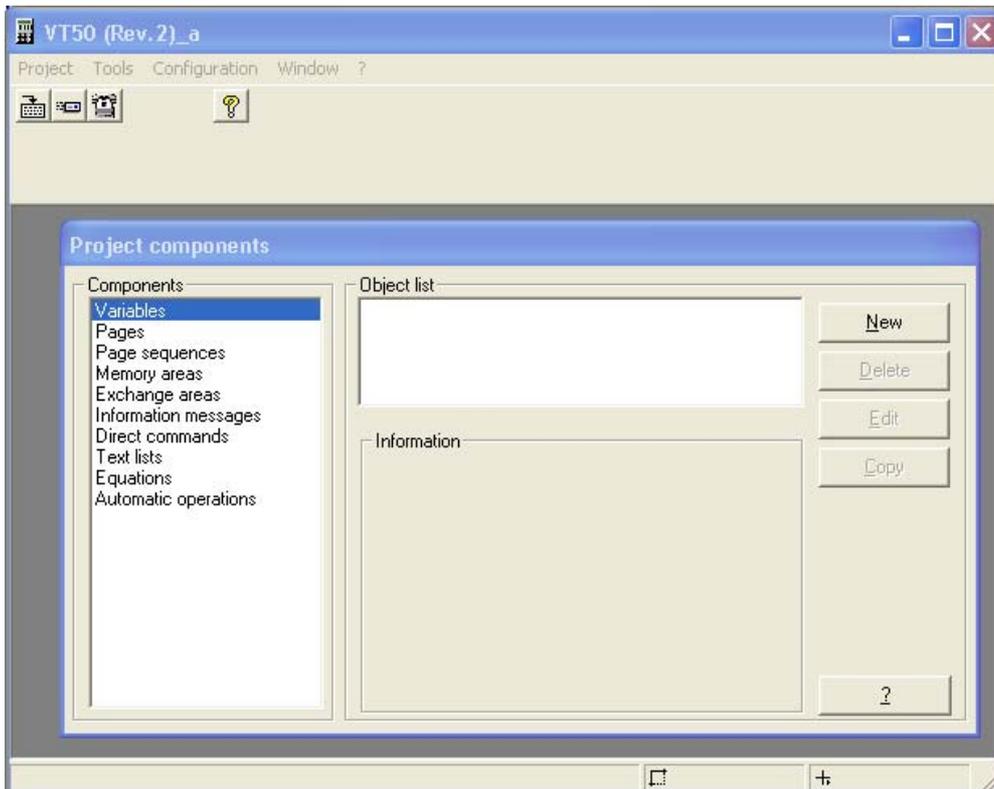


Fig. 10.

3.9 Six new variables will be created. Each variable will be a particular parameter from the same of different Unidrives SP. The variables to be created will be:

- **#18.11(SP1)** -----> Pr. 18.11 from Unidrive SP number 1
- **#20.21(SP1)** -----> Pr. 20.21 from Unidrive SP number 1

- **#18.11(SP2)** -----> Pr. 18.11 from Unidrive SP number 2
- **#20.21(SP2)** -----> Pr. 20.21 from Unidrive SP number 2

- **#18.11(SP3)** -----> Pr. 18.11 from Unidrive SP number 3
- **#20.21(SP3)** -----> Pr. 20.21 from Unidrive SP number 3

3.10 For **#18.11(SP1)** variable, the *Project Components: Variable* window will look like the one shown in Fig. 11. After filling all the fields, press the *Accept* and *Ok* buttons in this order.

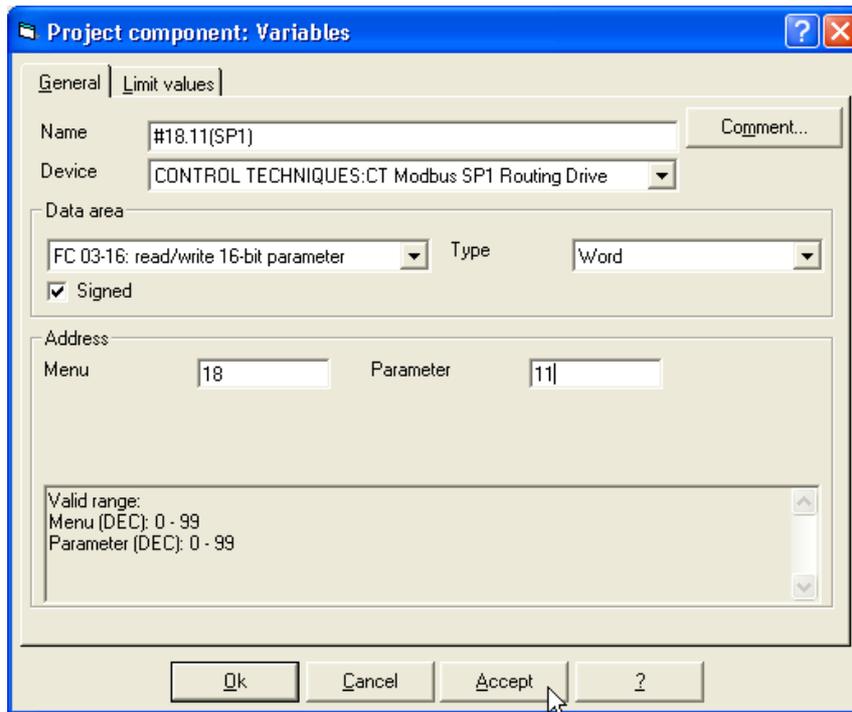


Fig. 11.

3.11 For #20.21(SP1) variable see Fig. 12.

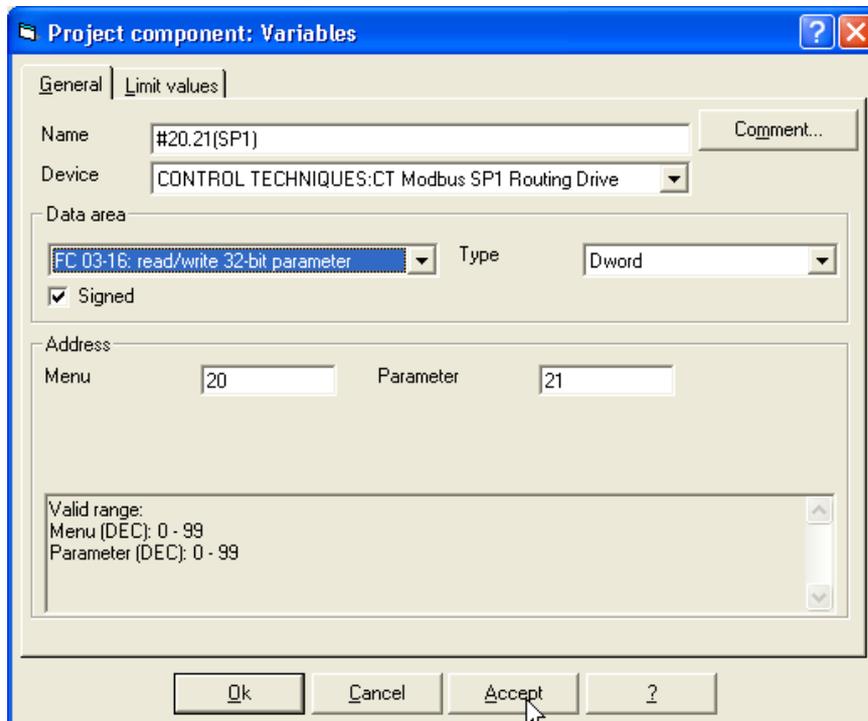


Fig. 12.

3.12 For #18.11(SP2) variable see Fig. 13

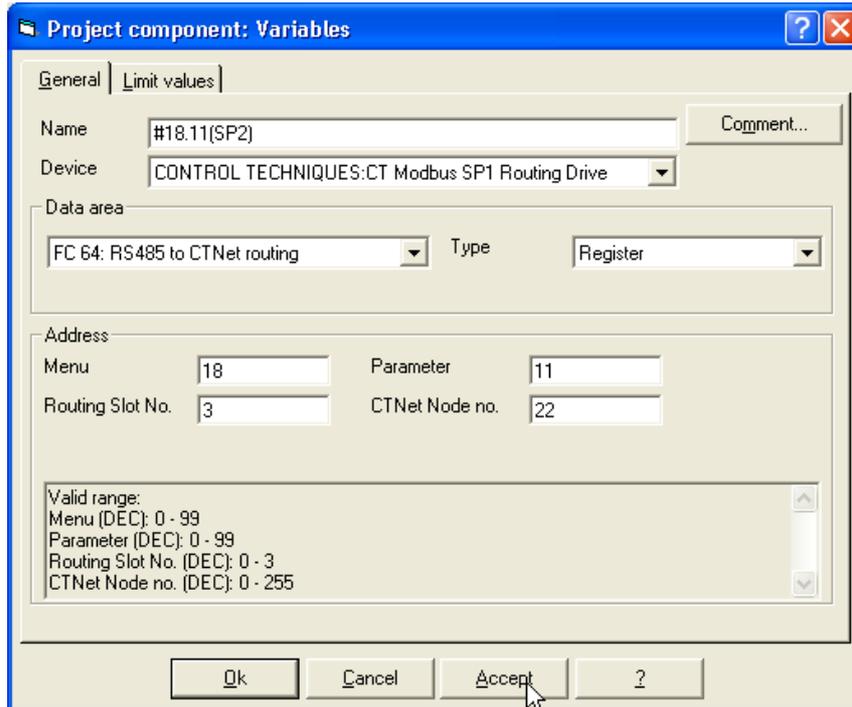


Fig. 13.

3.13 For #20.21(SP2) variable see Fig. 14

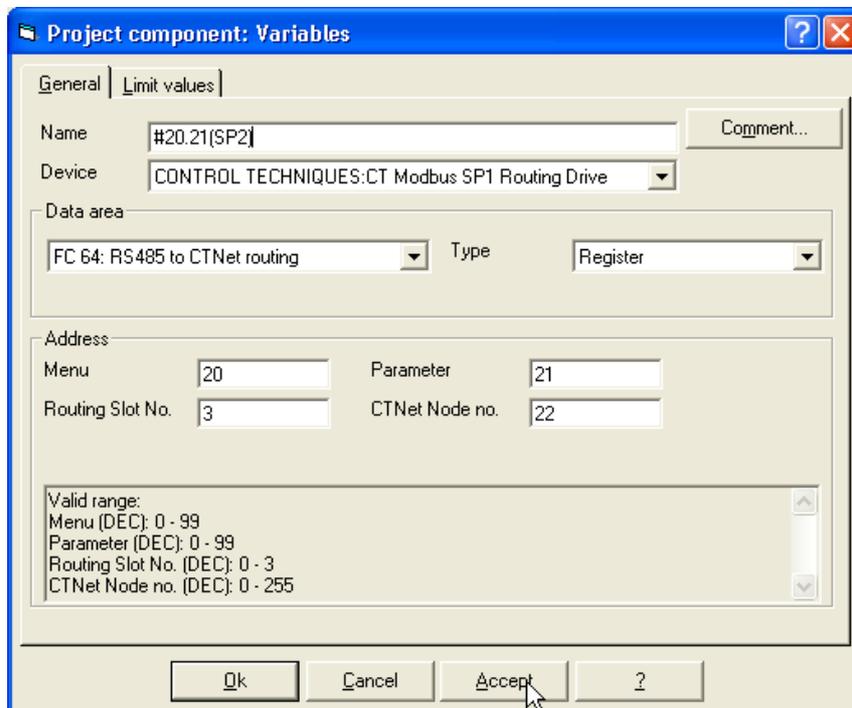


Fig. 14.

3.14 For #18.11(SP3) variable see Fig. 15

Project component: Variables

General | Limit values

Name: #18.11(SP3) Comment...

Device: CONTROL TECHNIQUES:CT Modbus SP1 Routing Drive

Data area: FC 64: RS485 to CTNet routing | Type: Register

Address:

Menu: 18 | Parameter: 11

Routing Slot No.: 3 | CTNet Node no.: 31

Valid range:

- Menu (DEC): 0 - 99
- Parameter (DEC): 0 - 99
- Routing Slot No. (DEC): 0 - 3
- CTNet Node no. (DEC): 0 - 255

Ok Cancel Accept ?

Fig. 15.

3.15 For #20.21(SP3) variable see Fig. 16

Project component: Variables

General | Limit values

Name: #20.21(SP3) Comment...

Device: CONTROL TECHNIQUES:CT Modbus SP1 Routing Drive

Data area: FC 64: RS485 to CTNet routing | Type: Register

Address:

Menu: 20 | Parameter: 21

Routing Slot No.: 3 | CTNet Node no.: 31

Valid range:

- Menu (DEC): 0 - 99
- Parameter (DEC): 0 - 99
- Routing Slot No. (DEC): 0 - 3
- CTNet Node no. (DEC): 0 - 255

Ok Cancel Accept ?

Fig. 16.

3.16 After declaring these six variables, the Project components window should show them within the Object list box. See Fig. 17.

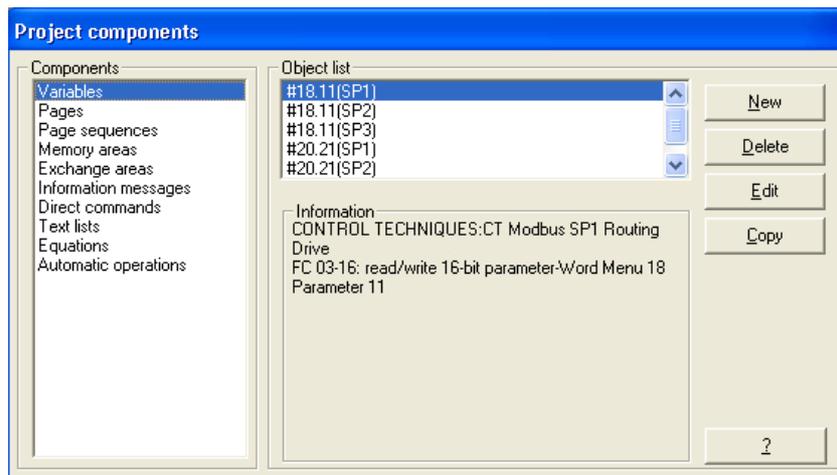


Fig. 17.

3.17 The next step is to design the pages on the HMI. Double-click on *Pages* from the *Project components* window. The *Project component: Pages* window will come up. Click OK. See Fig. 18.

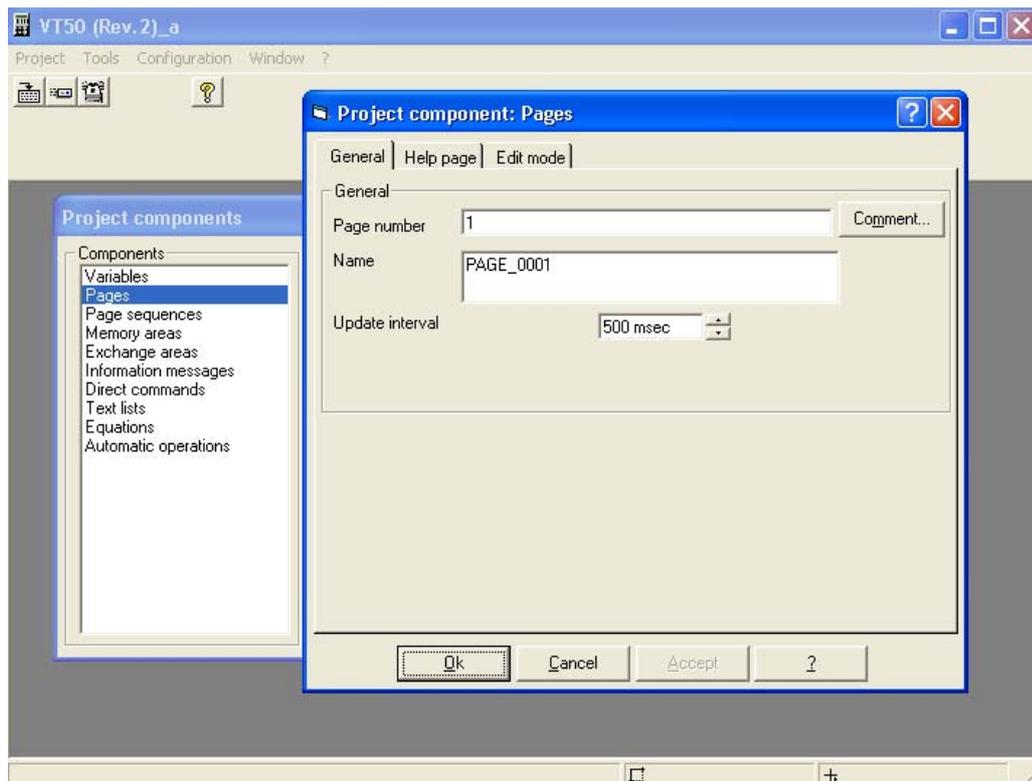


Fig. 18.

3.18 Page No. 0001 screen comes up. Click on the *Multilanguage label* icon from the main menu. See Fig. 19.

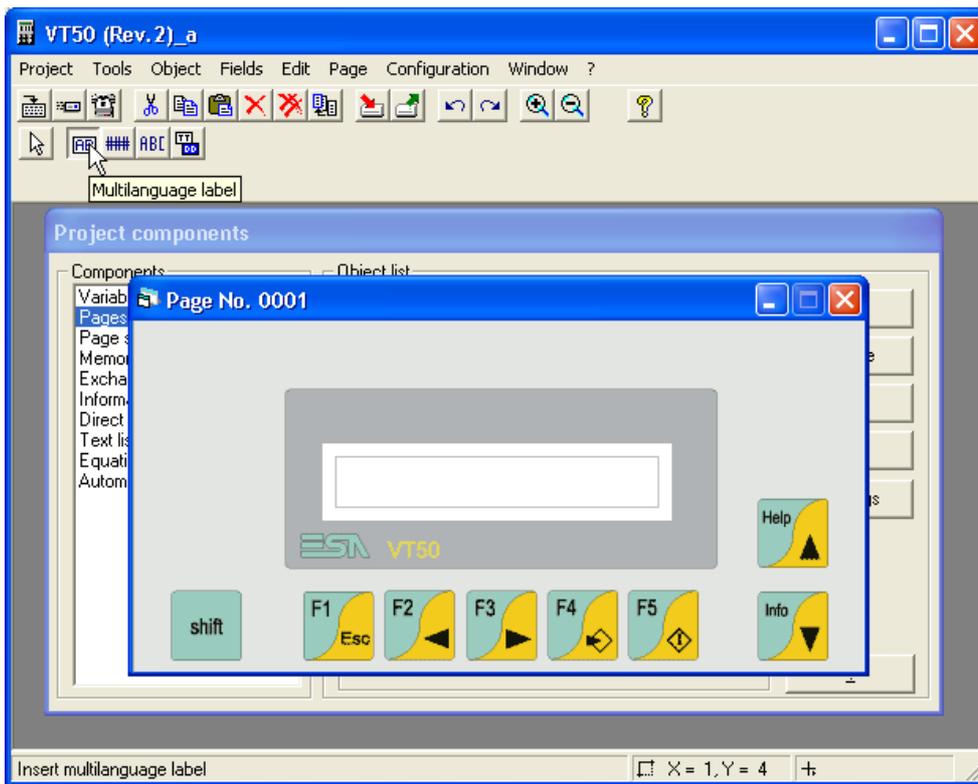


Fig. 19.

3.19 Click on the white zone within the Page No. 0001 and introduce the information as shown in Fig. 20. Then click on the *Numeric field* icon from the main menu.

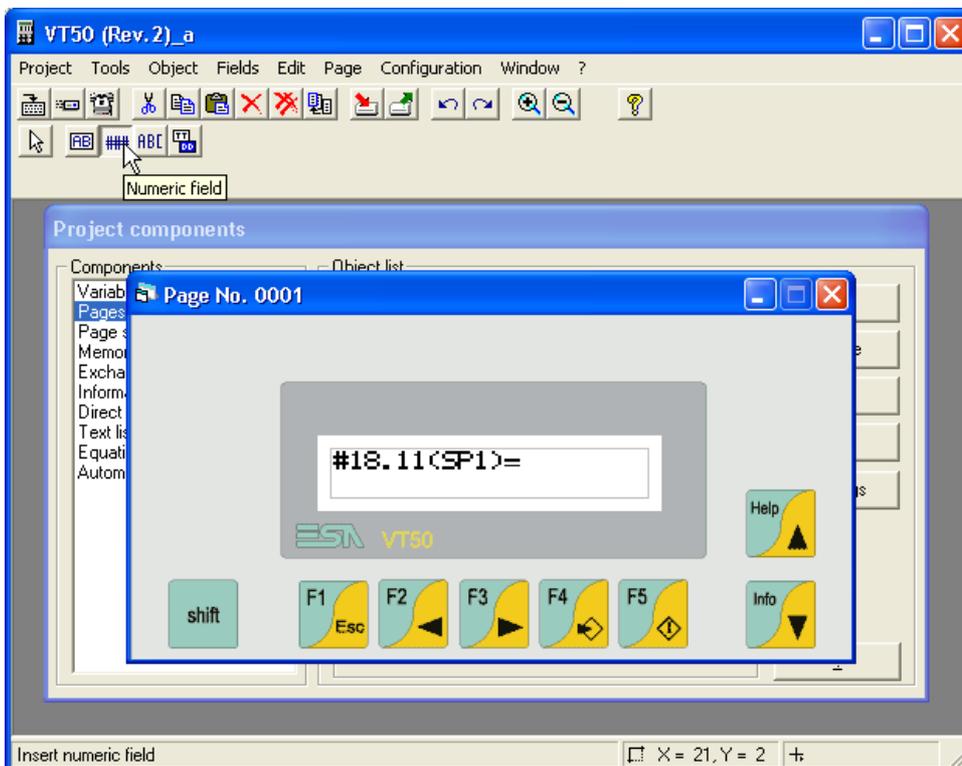


Fig. 20.

3.20 Having already selected the *Numeric Field*, click on the white zone within the *Page No. 0001*, beside the “=” symbol. Make sure that the variable name matches with the description previously typed on that page as shown in Fig. 21. Then click *Accept* and *OK*.

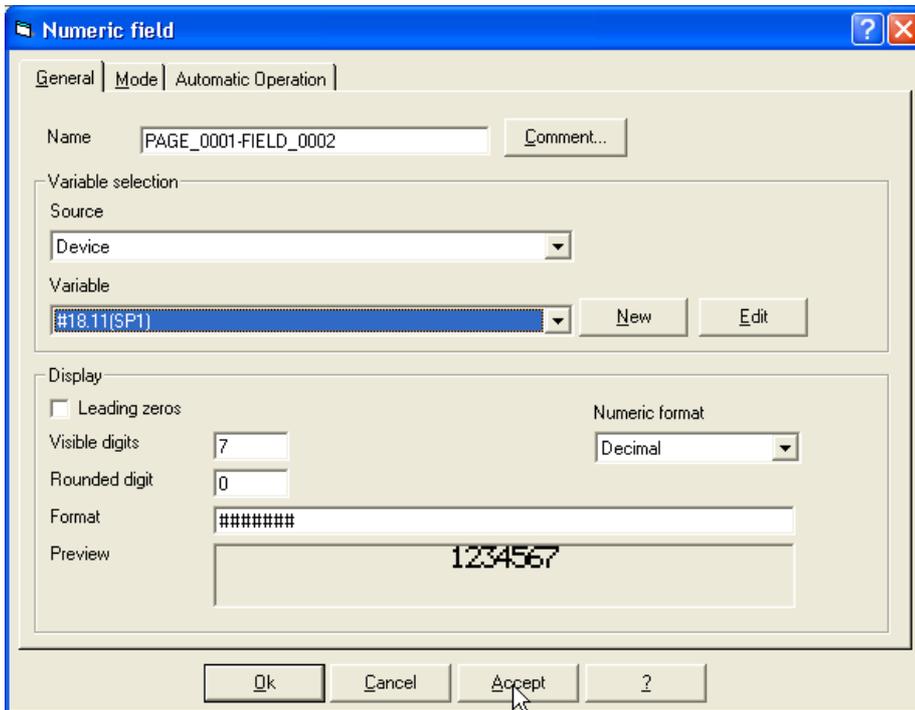


Fig. 21.

3.21 Proceed similarly as per point 3.19, to introduce the information as shown in Fig. 22.

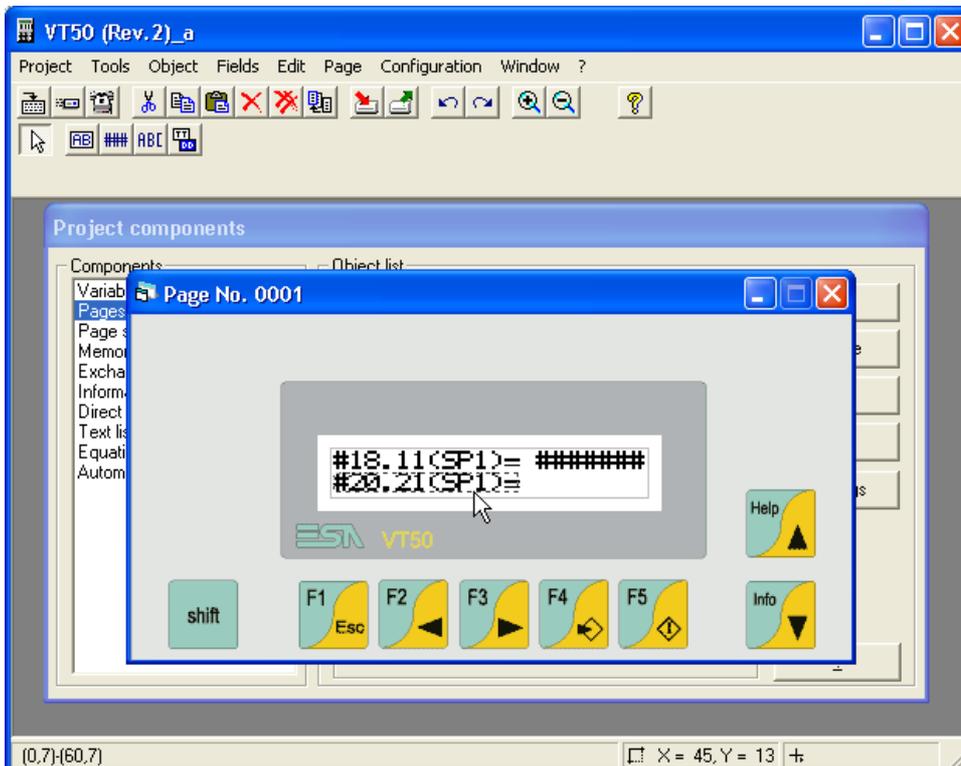


Fig. 22.

3.22 Proceed in the same way as per point 2.20. Make sure that the variable name matches with the description previously typed on that page as shown in Fig. 23. Then click *Accept* and *OK*.

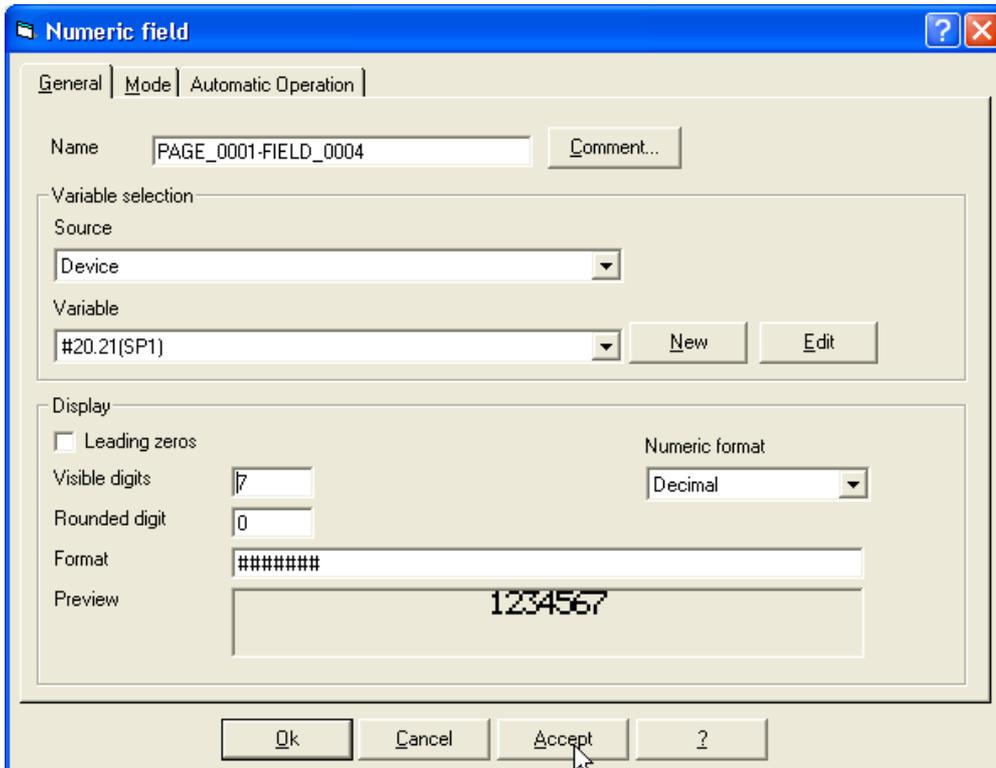


Fig. 23.

3.23 Page No. 0001 will look like the one shown in Fig. 24 eventually

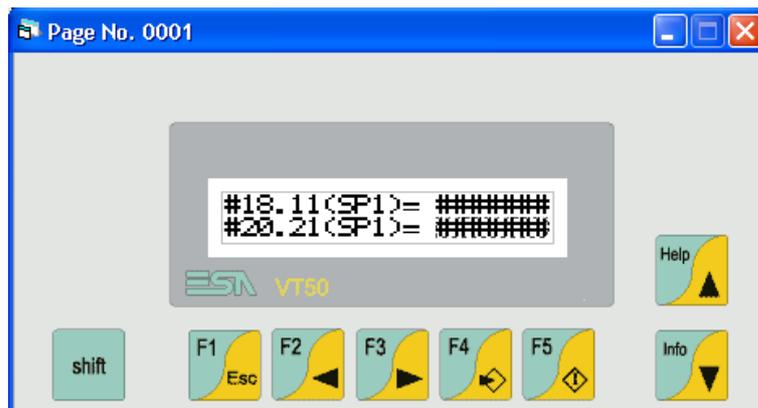


Fig. 24.

3.24 Proceed as previously and create Page No 0002 as per Fig. 25, 26, 27 and 28.



Fig. 25.

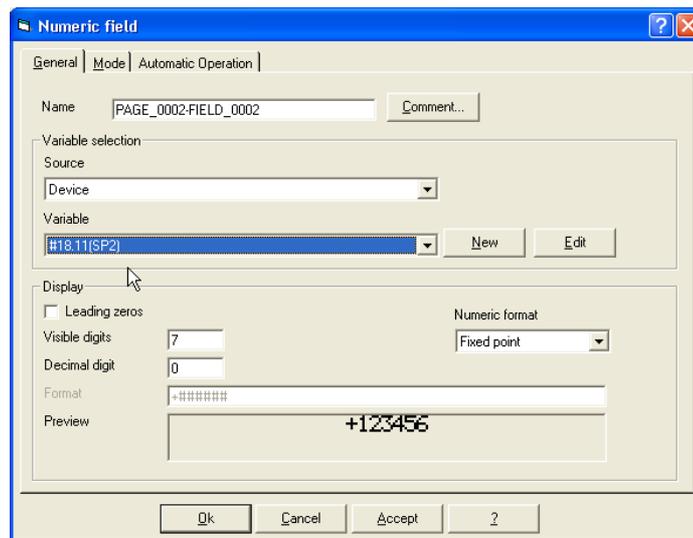


Fig. 26.



Fig. 27.

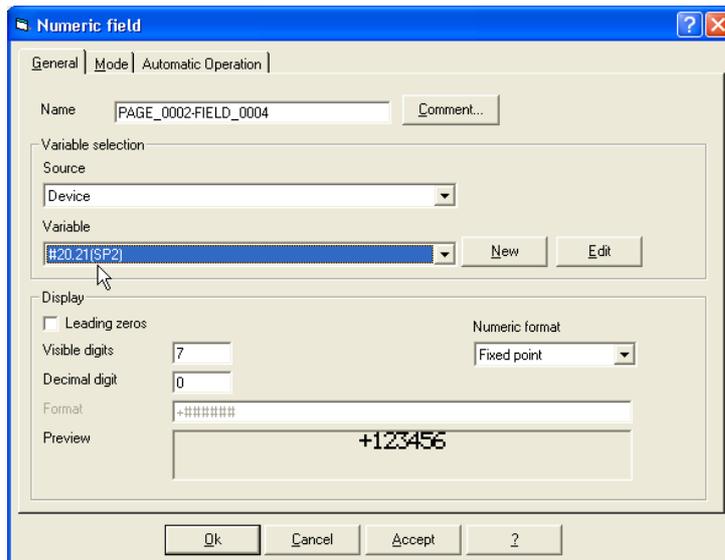


Fig. 28.

3.25 Page No. 0002 will look like the one shown in Fig. 29.

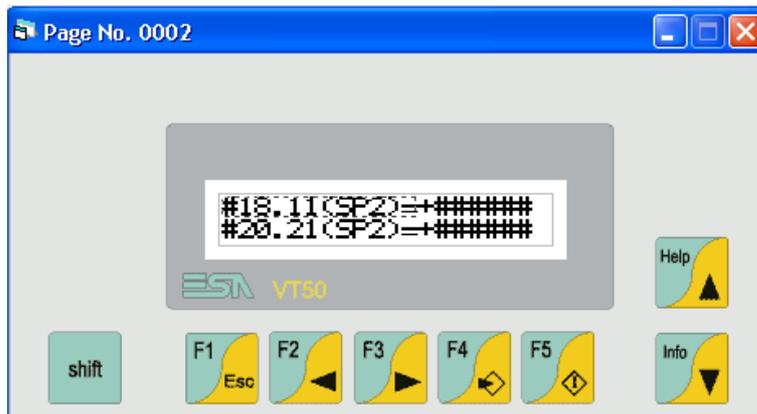


Fig. 29.

3.26 Similarly, proceed as before so as to create Page No. 0003, which will look like the one shown in Fig. 30.

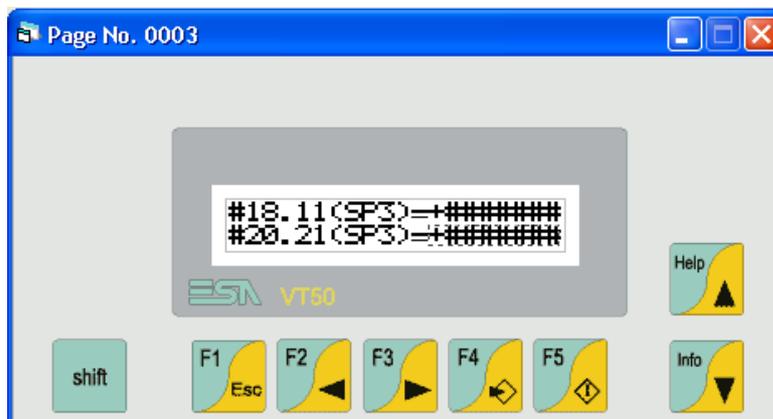


Fig. 30.

3.27 Close the Page No. 0003 window and then highlight the *Page sequences* option from the *Project components* window and double-click on it as shown in Fig 31.

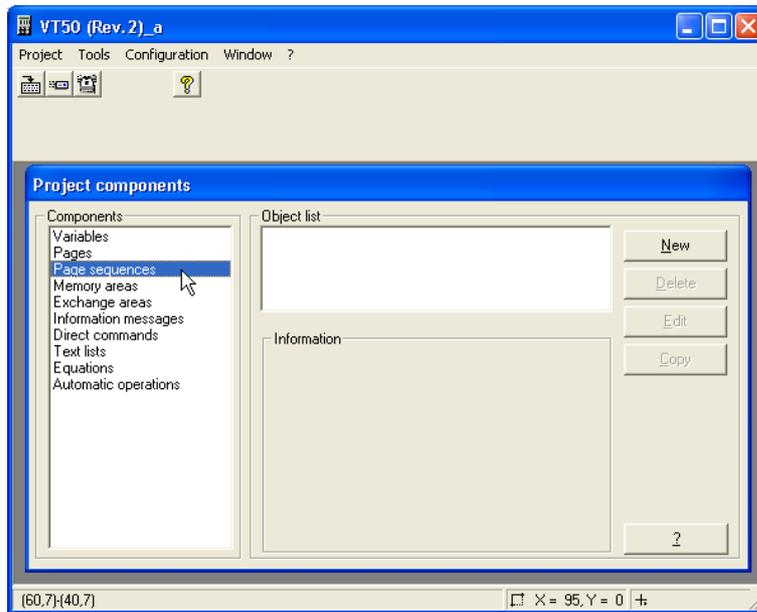


Fig. 31.

3.28 When the *Project component: Sequences* window comes up, choose Page No. 0003 as a *Stop Page* as shown in Fig.32. Then click *OK*.

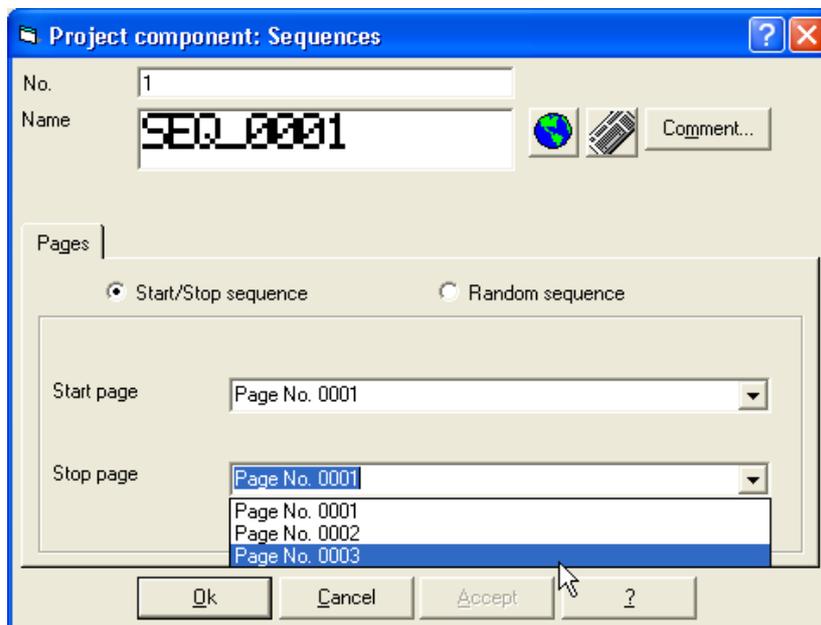


Fig. 32.

3.29 Click on the *Compile project* button from the main menu as shown in Fig. 33.

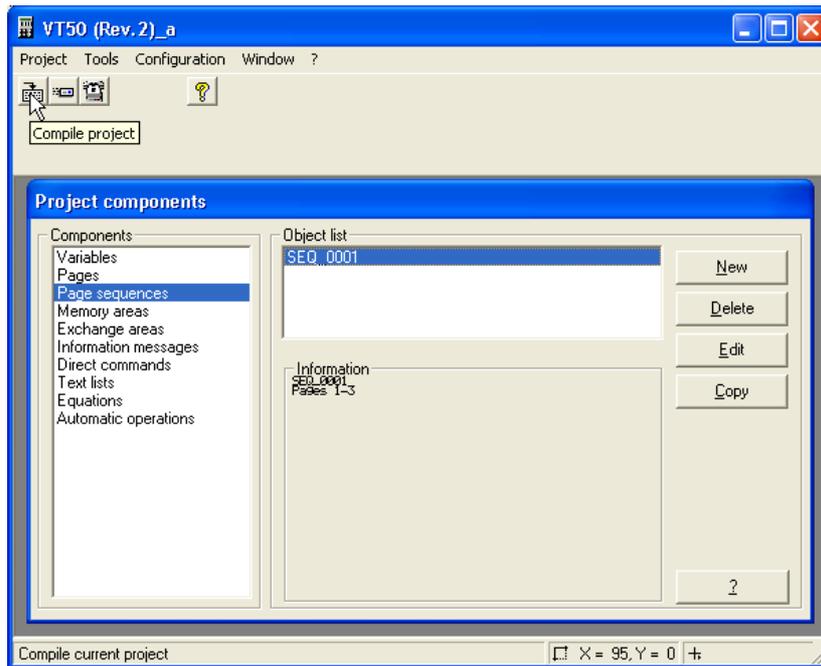


Fig. 33.

3.30 Before compiling make sure you save your project. See Fig. 34.

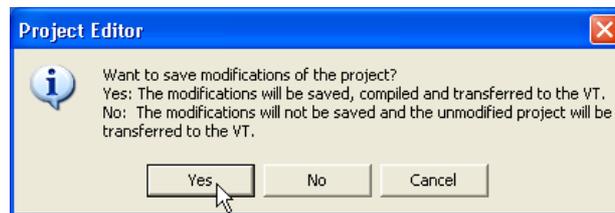


Fig. 34.

3.31 On the *PROJECT COMPILER* window, click on *Compile* as shown in Fig. 35.

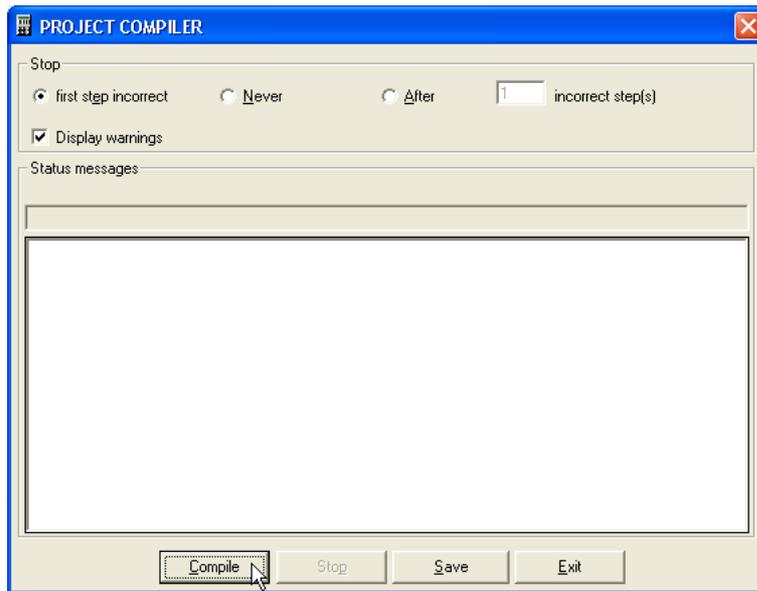


Fig. 35.

3.32 When the compilation process is finished, click on *Exit* as shown in Fig 36.

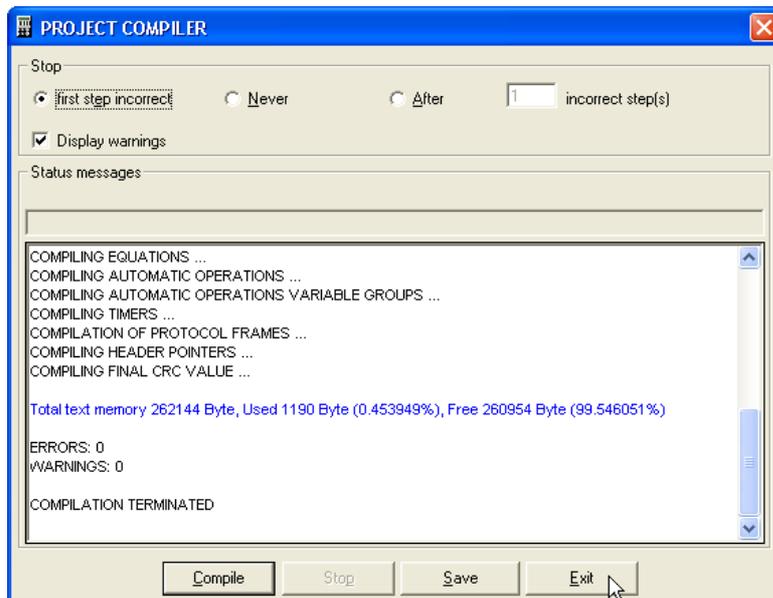


Fig. 36.

3.33 After the project is compiled, it needs to be downloaded to the HMI. To do that click on the *Download project* icon from the main menu as shown in Fig. 37.

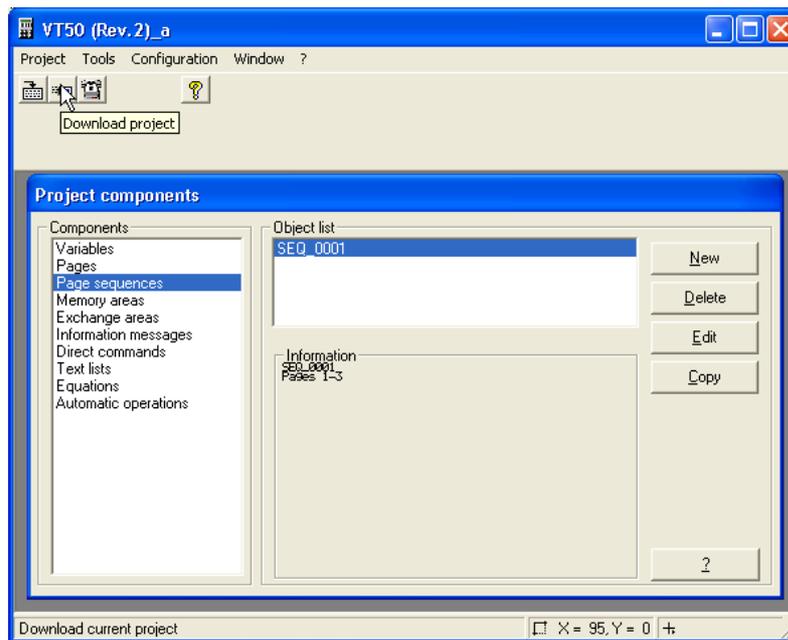


Fig. 37.

3.34 Before downloading the program, make sure the HMI is powered down. Also, connect the VT 50 terminal from the MSP port (DB25 standard connector) to the PC serial port using a standard serial cable. For pin-out information consult the Appendix at the end of this document.

3.35 Before powering it up hold the F5 key from the keypad.

3.36 Power the VT50 unit up while keeping the F5 key pressed.

3.37 The VT50 goes into a booting sequence mode and then asks for the download method. F1=MODEM – F2=PC.

3.38 Press F2 (downloading via PC).

3.39 A message on the display will appear saying “WAIT LOCAL CONNECT”.

3.40 Back in the VTWIN software, make sure than the *Port number* and the *Bit rate* are set accordingly on the PC side and then click *OK**. See Fig. 38.

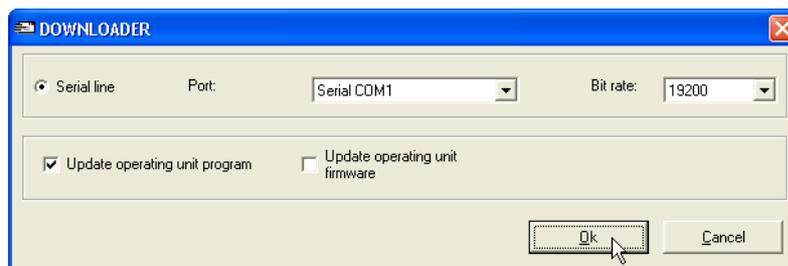


Fig. 38.

(*) Note: Make sure that the unit has the most updated firmware.

3.41 The *DOWNLOADER* window will appear temporarily and when the download is completed it will disappear. See Fig. 39.

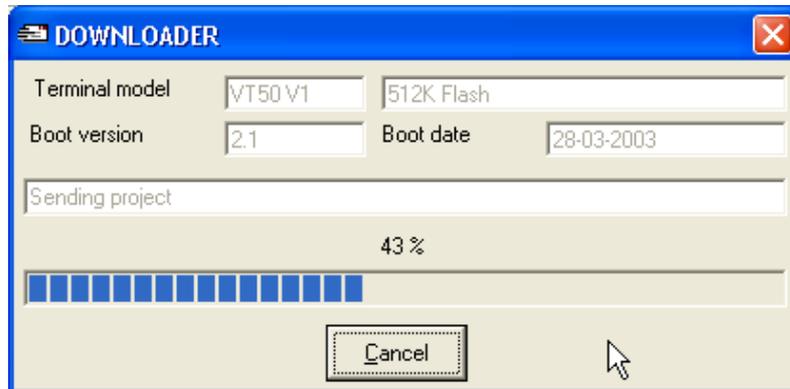


Fig. 39.

3.42 Once the project is downloaded into the VT50 unit, providing the Unidrive SP and the SM-Applications have been properly configured, and the appropriate communications cable is used (see appendix), the different drive parameters could be monitored from the HMI screen.

Note 1: PLC registers (menus 70 to 75) on the SM-Applications can also be accessed using the FC64: RS485 to CNet routing protocol.

Note 2: PLC registers from a local SM-Applications can be accessed by setting CNet Address No. to "0" only in the VTWIN configuration software. (A local SM-Applications is one SM-Applications fitted in on one of the slots of the Unidrive SP that works as a "routing drive"). Parameter xx.23 in the Unidrive SP that acts as a "routing drive" must contain a valid CNet node address (non equal to 0) at all times.

Appendix: Pin-Outs

a) Communications lead pin-out between the VT50 and the Unidrive SP

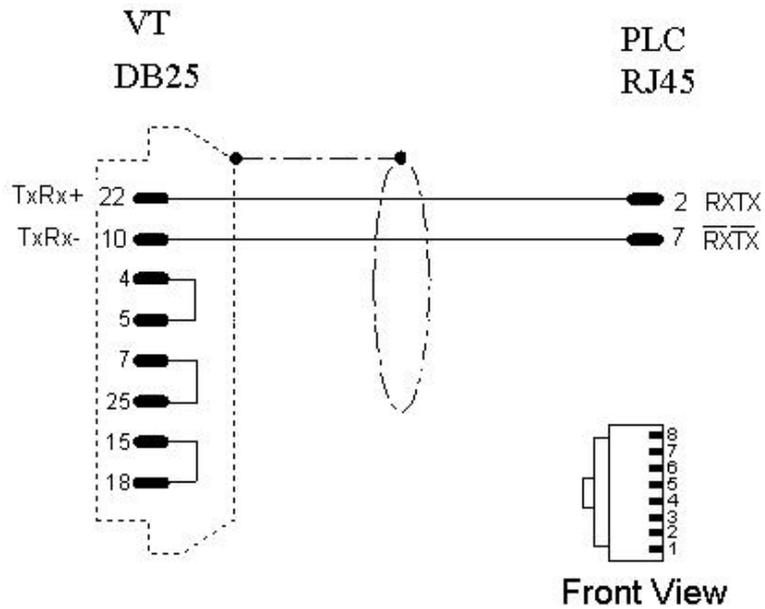


Fig. 40. Pin-out between the MSP port of VT50 unit and the RJ45 port of Unidrive SP

b) Configuration lead pin-out between the PC and the VT50

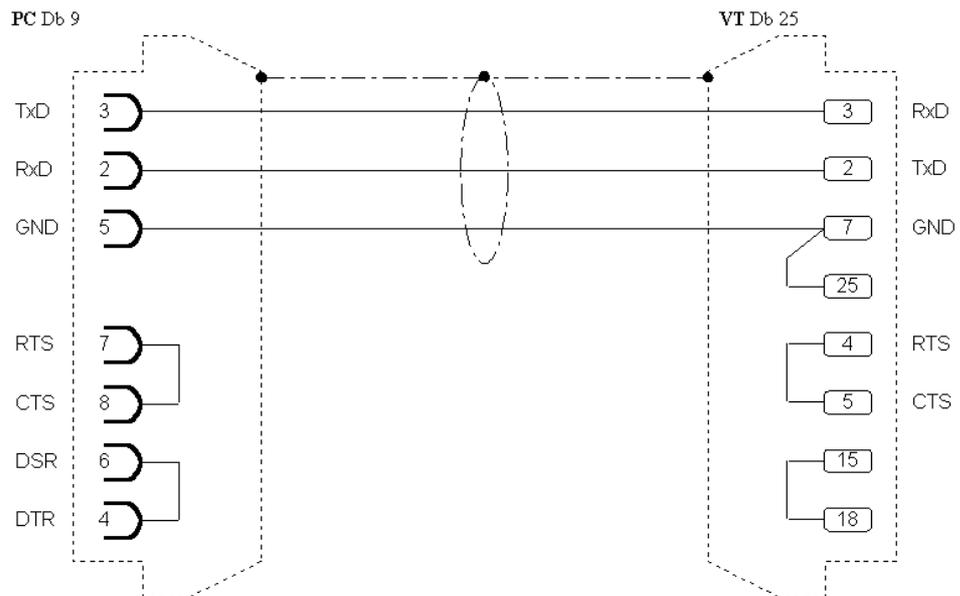


Fig. 41. Pin-out between the DB9 Serial port of PC and the MSP (DB25) port of VT50 unit.