

Description

There are two ways to display texts on a user interface of a PROCESS-PLC. The first option is to directly display texts by using the instruction

```
DISPLAY_TEXT [#0, cp=1, "ABCD"].
```

The second option is to use indirect addressing. For this purpose, a register is specified from which storage of the text starts

```
DISPLAY_TEXT [#0, cp=1, R(100)].
```

If text is directly entered into the display instruction, the capacity of the program memory will be reduced since the text is stored there together with the program code.

If indirect addressing is used, the text is stored to user registers which puts off load from the program memory.

This way of storing texts to user registers of the PROCESS-PLC is called "text register". Text registers have a special structure.

Structure of Text Registers

Each character of a text occupies one byte.

A user register of a PROCESS-PLC consists of 24 bit, thus of three bytes.

Therefore, a maximum of three characters can be stored to each register. So, longer texts to be stored to registers may occupy more than one user register. However, only the first user register, which is occupied by text, is specified as text register address.

This fact has to be taken into account when storing data to the memory of the controller. Otherwise, there is a danger of overwriting parts of the text.

In addition to the characters contained in the text, one byte indicating text status and one byte indicating text length are stored to a text register.

- As regards the status byte, only the first two bits are of interest:

Bit 0 of the status byte (bit 8 of the text register) is set	The text is displayed on a LCD17, Viadukt or JetLink display once-only. (The bit is reset automatically)
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Bit 1 of the status byte (bit 9 of the text register) is set	The text is displayed on a LCD17, Viadukt or JetLink display several times. (The bit remains set)
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- The byte indicating the text length specifies the number of characters of the text. Once the length of a text is known, the user can determine the number of user registers occupied by the text register.

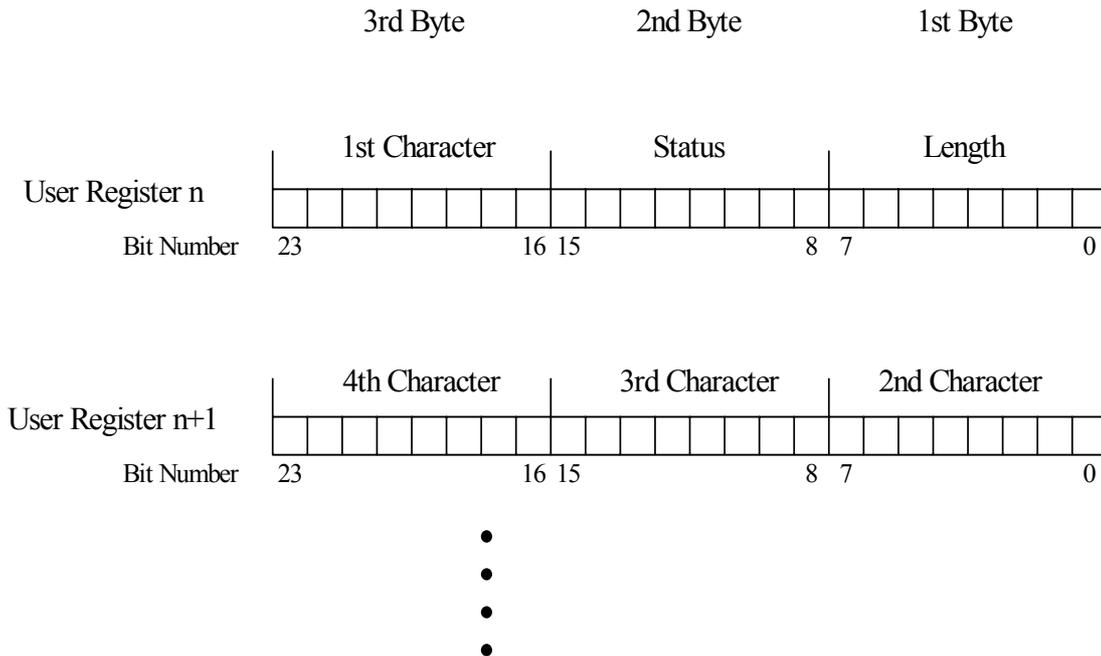
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Jetter AG
Gräterstrasse 2
D-71642 Ludwigsburg
Germany

Phone - Switchboard: ++ 49-71 41-25 50-0
Phone - Sales: ++ 49-71 41-25 50-5 30
Phone - Technical Hotline: ++ 49-71 41-25 50-4 44
Fax: ++ 49-71 41-25 50-4 25
E-Mail – Sales: sales@jetter.de
E-Mail - Technical Hotline: hotline@jetter.de
Internet Address: http://www.jetter.de



Example

The text "ABCD" was stored to a text register which has got the starting address 100. This text occupies two user registers since it comprises of four characters. In hexadecimal notation the user registers 100 and 101 appear as shown in figure 1.
(Hexadecimal notation in the register window (window 4) of the SYMPAS setup screen is activated by pressing key "H"):

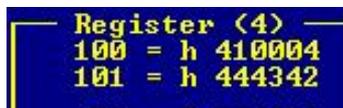


Figure 1

The least significant byte in user register 100 (the starting address of the text register) contains the hexadecimal number "04", thus, the length of the character string is 4 characters. The status byte of the character string is "00" (once-only display) and the first character has got the hexadecimal ASCII code "41" which corresponds to character "A".
The next three characters, starting with the least significant byte and also ASCII coded, are located in the next user register: these are the characters B („42"), C („43") and D („44").

Extract from the ASCII code list:

Character	ASCII code, hexadecimal	ASCII code, decimal
A	41	65
B	42	66
C	43	67
D	44	68
E	45	69
...
W	57	87
X	58	88
Y	59	89
Z	5A	90

Using Text Registers in SYMPAS

Text registers can be displayed in the text register window (window 9) of the SYMPAS setup screen. With the example mentioned above, the SYMPAS setup screen appears as follows in figure 2.



Figure 2

Symbolic Programming of Text Registers

Symbolic programming under SYMPAS makes definition of text registers much easier. The procedure is shown in figures 3 and 4.

Indirect addressing of the text in the text register is indicated by the letter "R" prefixed to the "rtText" symbol. Change to indirect addressing with the key combination *Ctrl-R*.



Figure 3

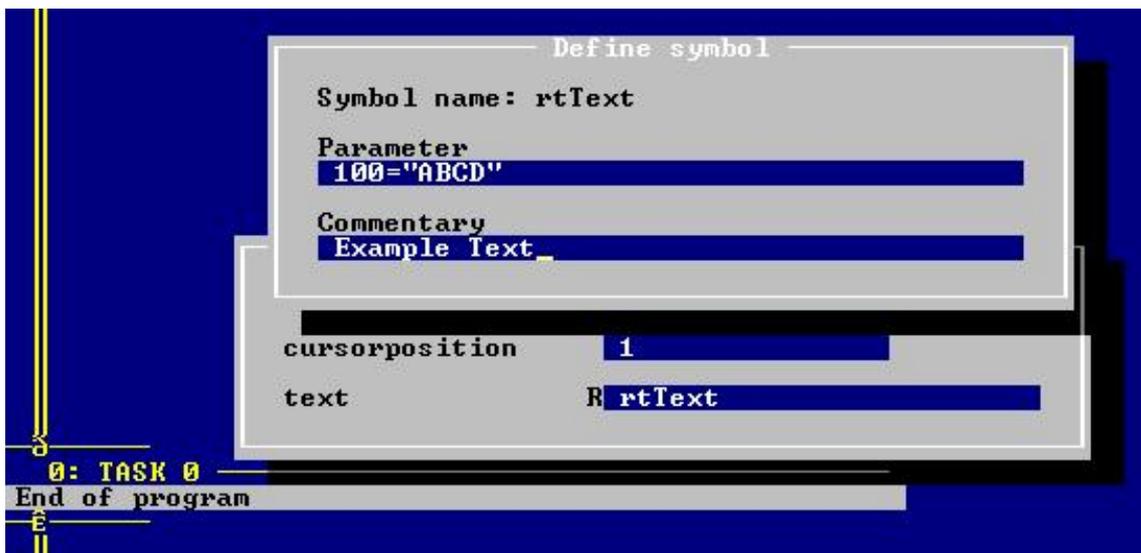


Figure 4

In the symbol editor of SYMPAS a line should appear as shown in figure 5.



Figure 5

Uploading a Program with Text Registers

In order to upload to the control system the contents of the text registers, defined in the symbol editor, the option "Transfer constants" in the "Settings" window (which can be opened by pressing the key combination *Ctrl-E (Strg-E)* or via menu item "Special / Settings ...") has to be activated by pressing the key combination *Ctrl-C (Strg-C)* (see figure 6).

Following activation, the program as usual can be assembled and uploaded from the program screen by pressing the key combination *Ctrl-F9 (Strg-F9)*.

The option "Transfer constants" is deactivated each time the program was uploaded to the control system in order to prevent unintended changes to the register contents.



Figure 6