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PRODUCT FAMILY: GS drives & C-more

Number: AN-GS-017

Subject: Control of a GS2 drive with C-more

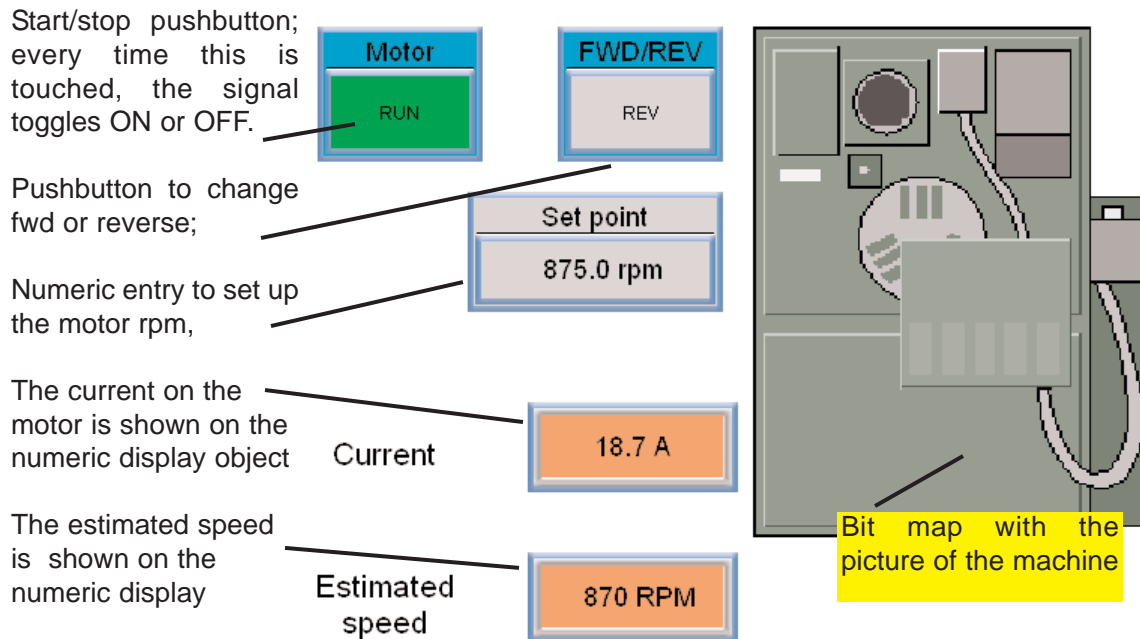
Date issued: Mar-7-2008

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In this application note we will develop a description on how to setup a C-more panel that is linked to a GS2-27P5 thru MODBUS RTU with a motor of 7.5 HP and 21 A .

The solution is a simple creation of 2 buttons, to control the start and stop of the AC drive, as well as define the direction of rotation. We also cover how to wire the C-more to the AC drive.

See below the simple screen that we will develop. Of course, more parameters than the speed can be changed from the C-more panel.



We will show how to accomplish this task. Later, we will show the wiring between the C-more and the GS2 drive.

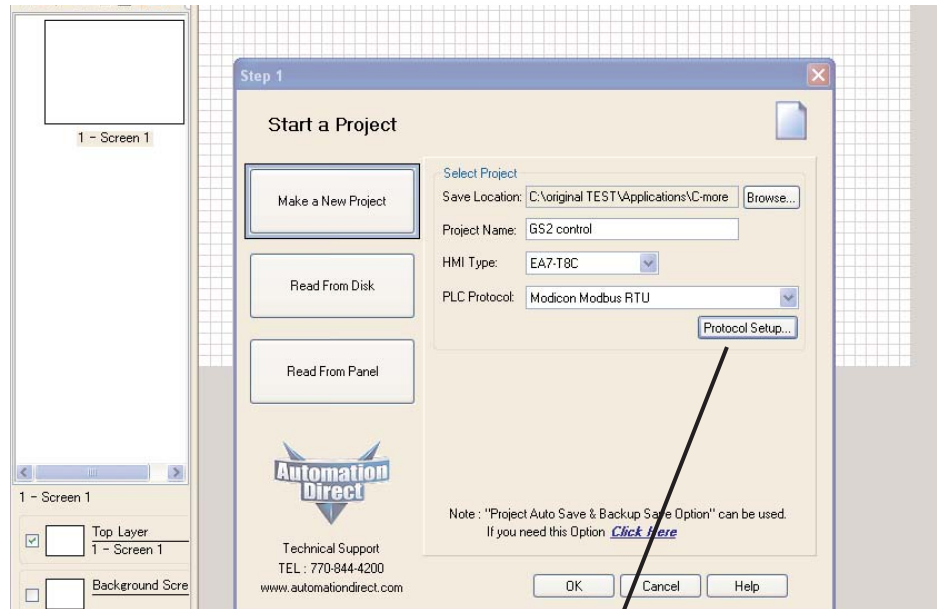
We will use a panel EA7-T8C and the motor has a speed of 1750 rpm at 60 Hz.

In order to do this, please create a new project on the C-more software. The On-line Help file has a tutorial that teaches how to open a new project.

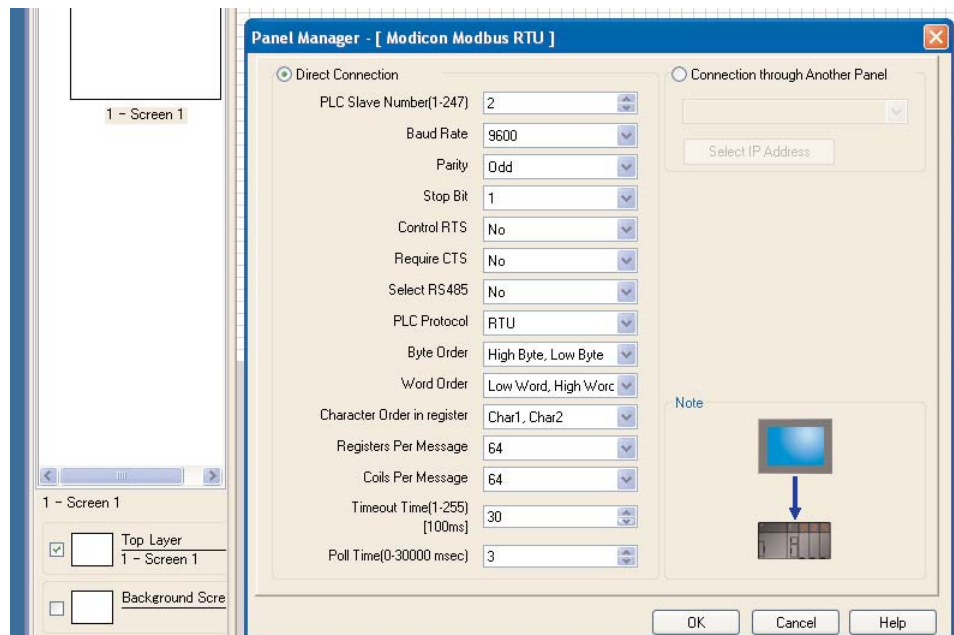
The step 1 is to create the project with a MODBUS protocol.

The next page shows, on the figure on the top, how the software looks and what are the fields that should be filled in.

The C-more will be configured here as slave 2, for 9600 Baud, parity ODD, stop bit 1, and for RS-485, as shown on the bottom figure of next page.



The project can be saved on any available folder and be called any name you want. When this is filled in, click on the Protocol setup button and the Panel Manager dialog box will pop up. In there, you will define the parameters for communications, such as slave number, baud rate, and others.

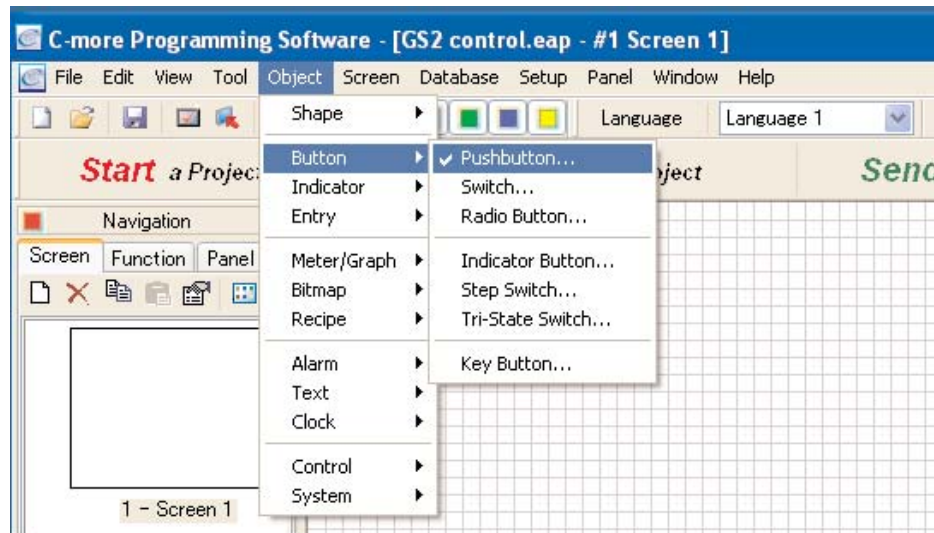


When this is done, click OK and save the project by clicking on the disk icon on the top left or select **File>Save project**.

On the GS2, the parameters of group 9 shall be entered accordingly to match the ones on the C-more panel:

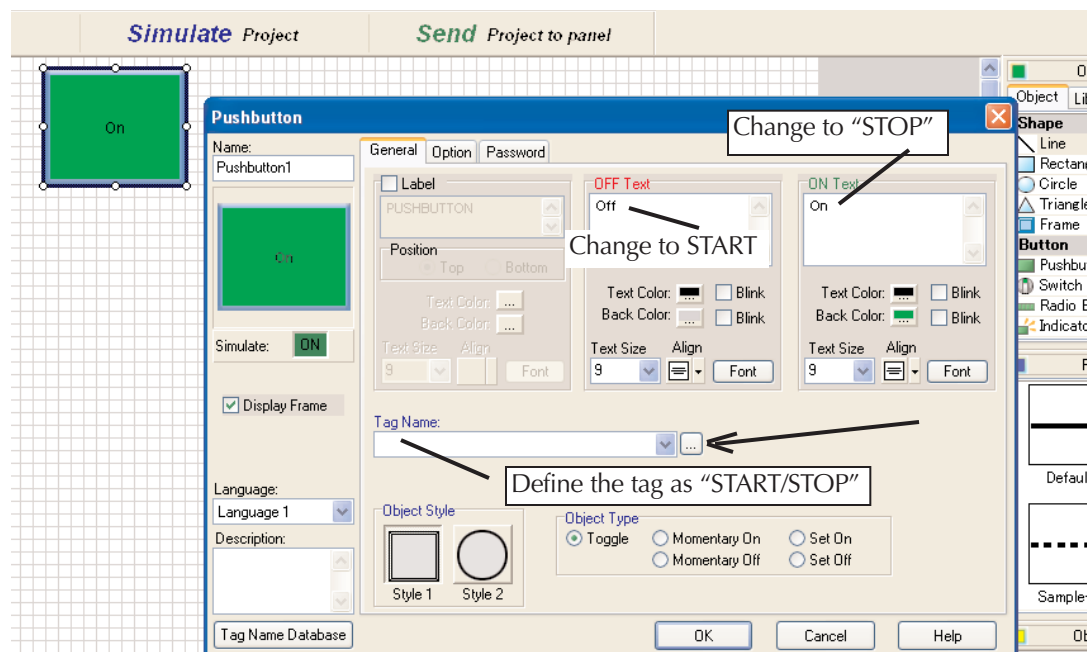
- P9.00 => 2 (slave #)
- P9.01 => 01 (transmission baud rate)
- P9.02 => 05 (MODBUS RTU , 8 data bits, Odd parity, 1 stop bit.

Now we are ready to create the first pushbutton. Click on the menu Object and then select and click on Button>pushbutton, as shown on the figure below. The cursor



will turn into a cross and then it will be possible to drag the cursor to form a rectangle. This rectangle can be positioned anywhere on the screen 1 and, in this case, let us set on the top left, as indicated on page 1.

When this is done, the Pushbutton dialog box will pop up, as shown in the figure below:



This dialog box, as any other, will customize the object for the specific desired function. In this case, we need to associate the pushbutton with the start/stop command on the GS2. See page 5-8 of the GS2 user manual. It says there that the MODBUS address for parameter P9.27 is 42332.

We will use the tag name Start/stop and we will fill up the tagname on the proper field of the dialog box. After that, click on the button at the right with 3 dots [...].

When the button [...] is clicked, another box will pop up and request the specific data for this object.

- The device name shall be DEV001 (Which is, by default, the name of the slave. This name could be changed, if desired),
- The data type is Discrete,
- The PLC address is as shown on the adjacent figure.

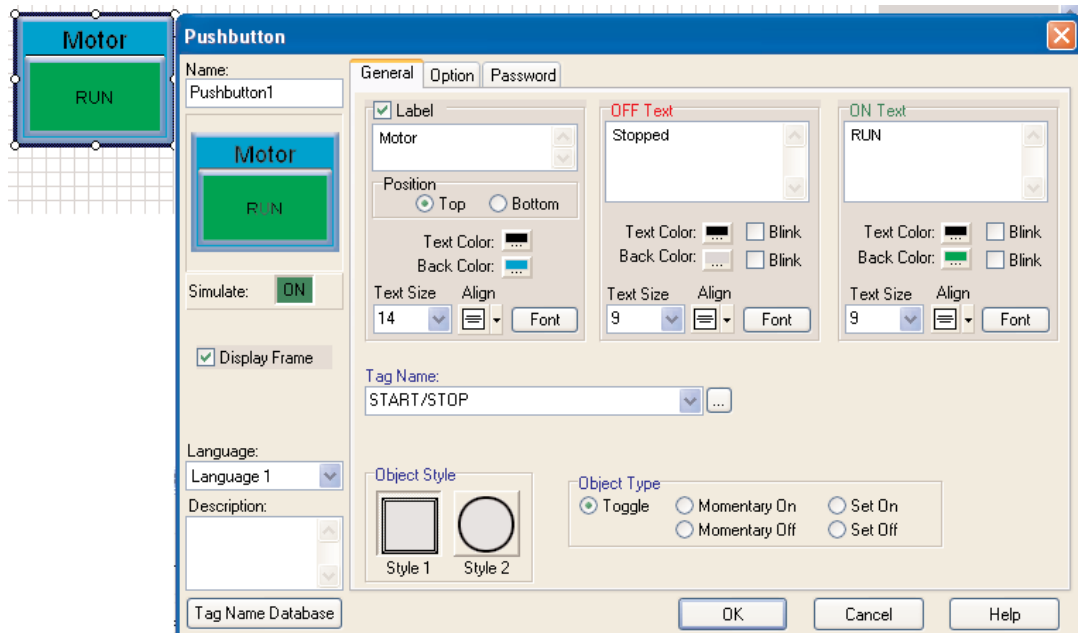
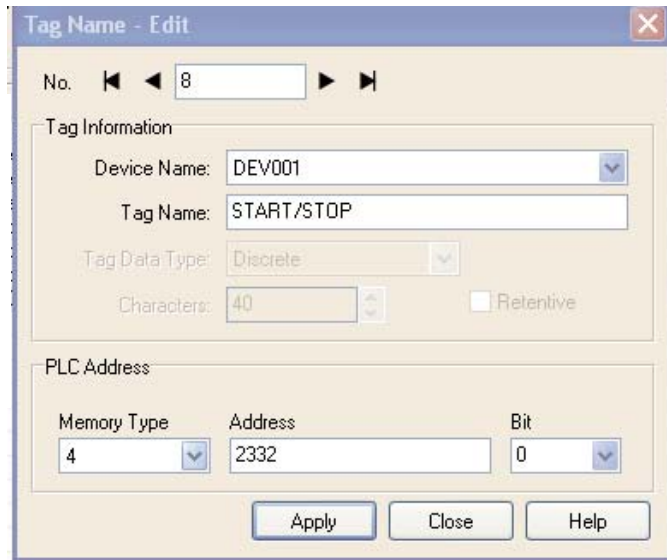
Then click on the button Apply and then Close.

This is the basic configuration of a pushbutton. However, we have to be able to show the status, change the style, and

add some function options. For now, just change the label to Motor, the background color and the ON and OFF texts.

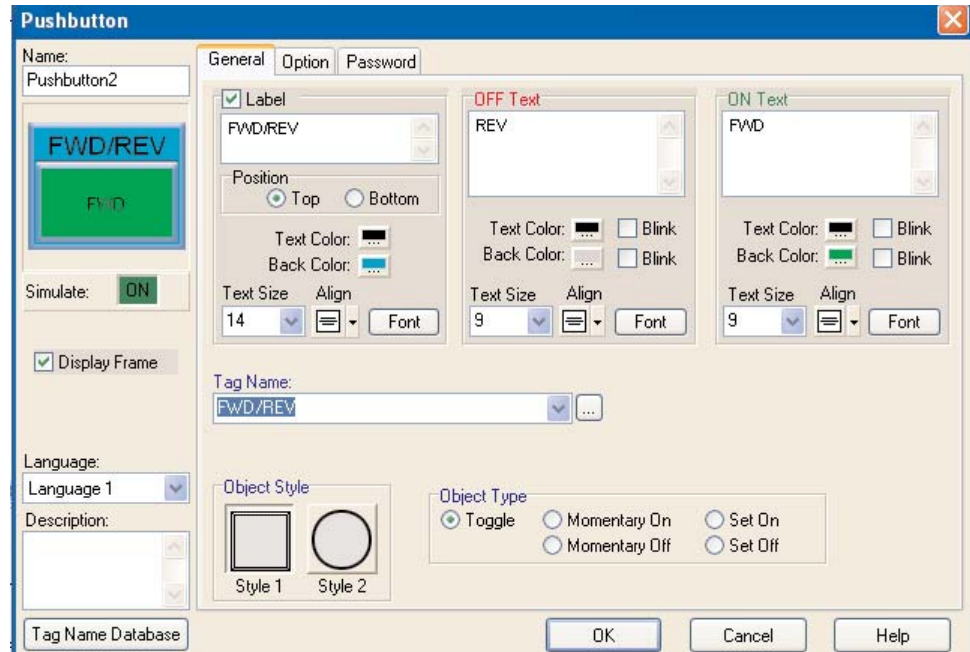
We will leave the Object type as **Toggle**, that is, a button that, when touched, sets the start/stop bit and when touched again, reset it. Notice that you can change the size of the fonts, as well as the fonts themselves, the text or background color, one condition blinking, etc.

In order to create the FWD/REV button, we can follow the same procedure, customizing it, or simply copying and pasting.



Let us do the copy. Just click over the Object created. Then use the techniques of Windows (CTRL+C or click on the menu Edit> Copy). This will allow to copy the object to the Clipboard.

Then paste it with one of the techniques of Windows (CTRL+V or click on the menu Edit> Paste). A copy will show up over the existing pushbutton. Just drag it to the desired position. Then, you can change the data by editing the object. Right click



over the pasted pushbutton. Then you can change the corresponding fields to what is shown on the following figure.

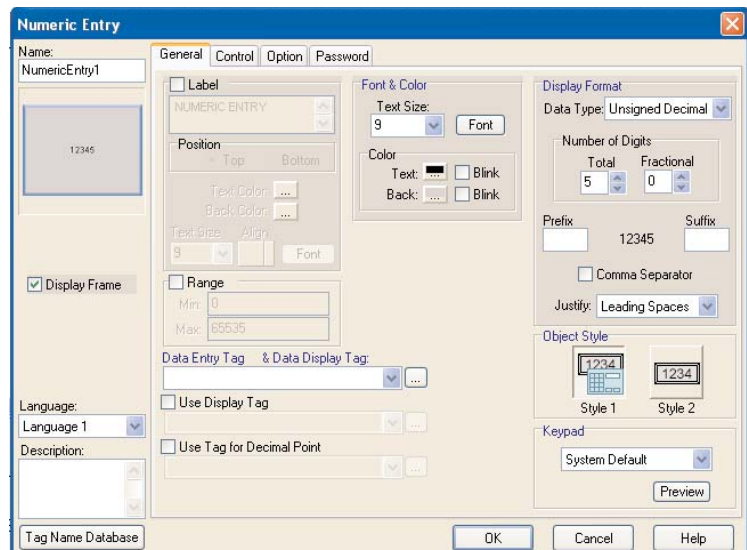
The tagname FWD/REV will be associated to the proper address. See page 5-8 of the GS2 user manual. It says there that the MODBUS address for parameter P9.28 is 42333.

You can save the project at this stage.

Now we are ready to create the numeric entry object that allows us to set the desired motor speed. Click on the menu **Object** and then select and click on **Entry>Numeric entry**. The cursor will turn into a cross and then it will be possible to drag the cursor to form a rectangle.

When this is done, the dialog box will pop up, as shown on the adjacent figure:

You should know that the GS2 accepts frequency as set point, with an unsigned 16 bit decimal format and this is located on address 42331 (Parameter P9.26).



This dialog allows several options that you can see and learn more about it on the on line help. For the current example we will deal with the following fields.

- Label.. set as SET POINT
- Data Type ... set as Signed decimal
- Display format.. set as 4 digits, and 1 fractional
- Suffix.. set as rpm
- Tagname. set as Speed SP, with address 42331
- Under the OPTION tab, select scaling option, and set that 60.Hz will correspond to 1750 rpm.

Accept and save project to the disk.

Now we are ready to create the BITMAP object. Click on the menu **Object** and then select and click on **Bitmap>Static bitmap**. The cursor will turn into a cross and then it will be possible to drag the cursor to form a rectangle.

When this is done, the BITMAP dialog box will pop up ,as shown on the figure below:

This dialog allows several options that you can see on the on-line help. For the current example, we will deal with the following fields:

- Image - read from symbol.
(You can select your own bitmap) and select from HVAC, the first symbol.

Click on OK and then save project .

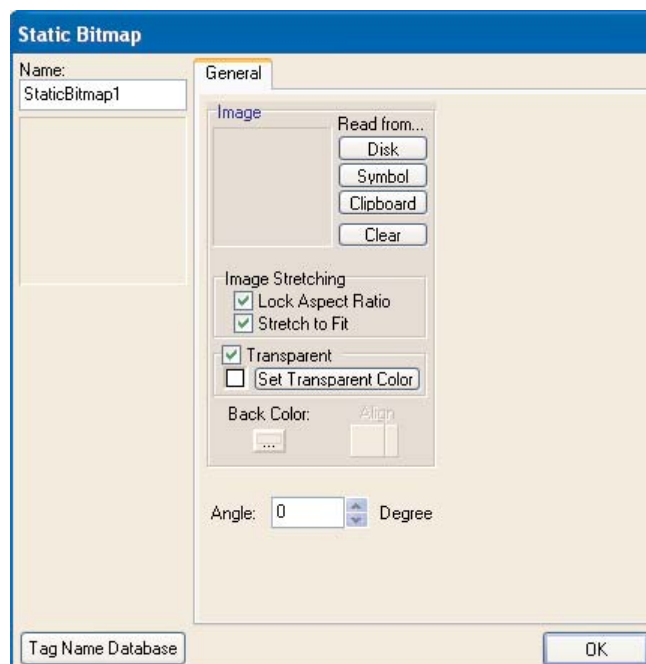
You can stretch the figure as needed.

This is a good method to put a picture of your machine, or a mimic diagram of your process, or even the brand of your industry.

Finally we will create two numeric display objects with a **TEXT** description.

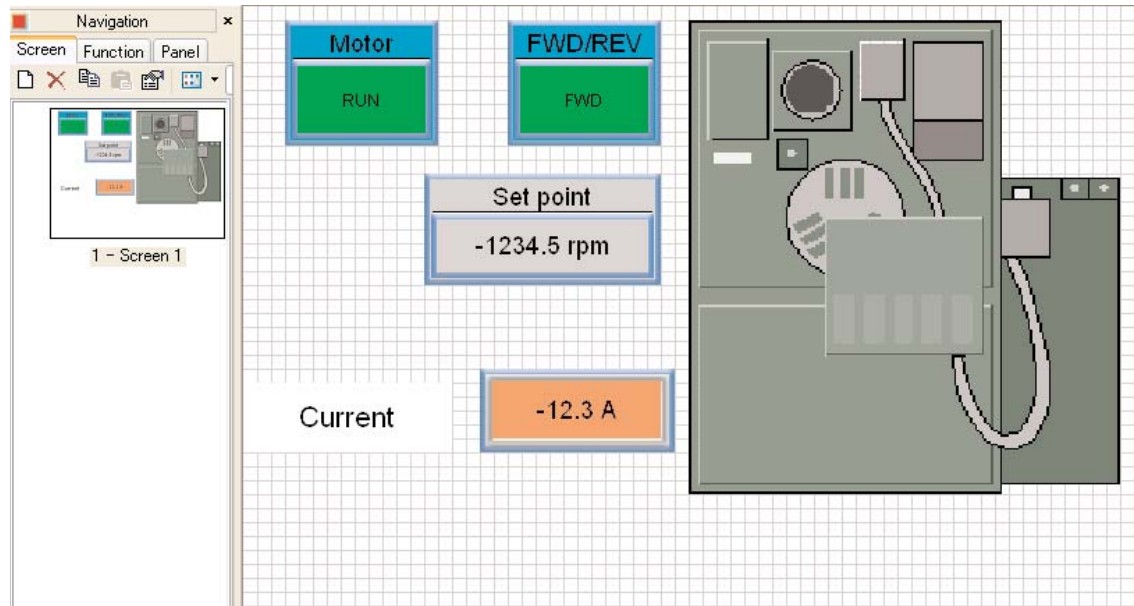
Click on the menu **Object** and then select and click on **Text>static text**. The cursor will turn into a cross and then it will be possible to drag the cursor to form a rectangle. When the dialog box pops up, write **Current** somewhere on the available space, uncheck the Display frame box and select a white background. set a text size of 14. Accept the settings and save project.

Click on the menu **Object** and then select and click on **Indicator>Numeric display**. The cursor will turn into a cross and then it will be possible to drag the cursor to form a rectangle.



Set it at the right of the text **Current**, and select a light orange background. Set the tagname as **CURRENT** and associate it to the address 48453. Set the font size to 14 and Apply the settings and save project.

At this time you will have a project similar to the one on the next figure:



You can copy and paste the text and the numeric entry by selecting both. For that, please click outside the boundaries of the 2 objects, as in the area marked on the figure above, to form a rectangle that will select both objects. Alternatively, you can press and hold the CTRL key and select each object b.

The objects will show small circles on the corners, showing that they are selected. Then, copy and paste as explained earlier. Then you can displace them to the bottom, and get ready to change them.

Right-click on the bottom text and change the text field to **ESTIMATED SPEED**. Then save the project to the hard disk.

Right-click on the bottom NUMERIC ENTRY and change the **Data display Tag** field to **ESTIM SPEED** and associate the address to 48456 (See page 5-9 of user manual). Also change the suffix to **rpm** and the number of digits to 4, with 0 fractional. Then save the project.

You can create other screens, for example, to display a trend chart or any other variable that is related to the drive. In order to create a new screen, you just click on the menu **SCREEN** and then **NEW SCREEN**.

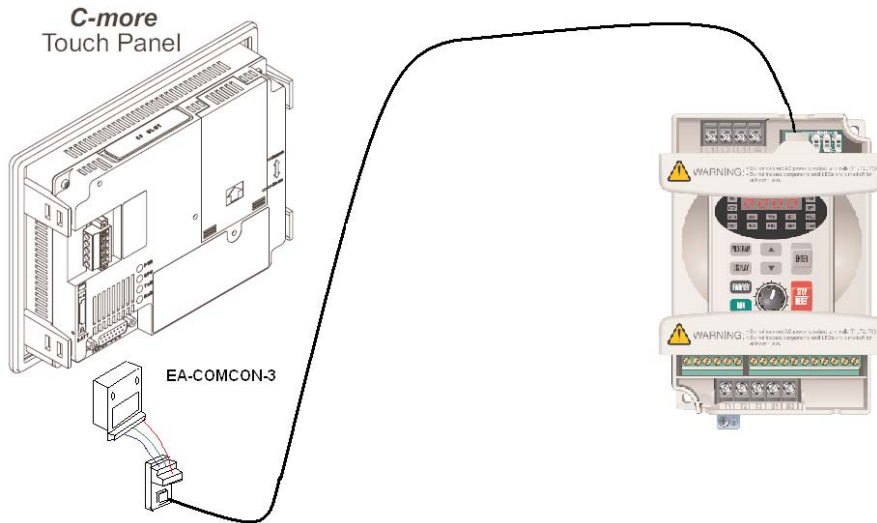
Of course, you have to create another object to allow the operator to change from screen 1 to screen 2.

This can be learned on the on-line user manual.

At this time, you can send the project to the panel. You can use the USB port and the cable USB-CBL-AB15, for example, or Ethernet. The panel should be energized with 24 VDC when there is transfer of data from the PC to the panel. See more details in the hardware user manual.

Wiring

The following figure shows one solution of how to wire the C-more panel to the GS AC drive. Of course, in this case, the GS2 drive DIP switch RS-485/RS-232 on the top of the AC drive should be set to RS-485.



The following figure shows the wiring including the pinout of each component in the communication link. The link between the EA-COMCON-3 and the ZL-CMRJ12 can be, for example, a Belden 9841 or any one rated for RS-485 transmissions. This cable can be up to 3200 feet.

