



APPLICATION NOTE

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Product Family: Cmore and Cmore Micro

Number: AN-EA-005

Subject: Changing CMore and CMore Micro Screens From the PLC and Panel

Date Issued: 9-4-08

Revision: Original

This application note describes a potential situation and offers a solution for applications where both the PLC and the operator can change screens on the panel. If the panel has only one screen, or the panel is only going to have screens changed by the operator, or the panel is only going to have screens changed by the PLC then the problem described by this application note won't apply.

Some applications allow both the PLC and the operator to change screens in the CMore or CMore Micro operator interface. There is the potential for a problem where the operator has changed the screen from a PLC commanded screen and the PLC is unable to change the screen back to its previously commanded screen. This application note will describe what causes this condition and how to use ladder logic code and the panel features to prevent it from occurring.

You can also download and review the example program EP-EA-001 to see the ladder logic for the Koyo PLCs as described in this application note. A PDF copy of the ladder logic is also included in the example program.

The CMore and CMore Micro panels offer a feature called "Switch to Screen Number". This allows the panel to monitor a memory register inside the PLC. If the PLC writes a valid screen number into this location the panel will switch to the commanded screen.

The "Switch to Screen Number" parameter is a tag in the CMore/CMore Micro panel. As with any tag in the panel, it must:

1. Be assigned to use the correct DEVICE defined in the Panel Manager.
2. Be assigned the correct data type, in this case the data type the PLC will use when it writes the value.
3. Point to the correct address or tag inside the PLC.

Once the "Switch to Screen Number" parameter is set up by creating the tag from **Setup / PLC <--> Panel / PLC to Panel / Switch to Screen Number** and the project is sent to the panel, the panel will monitor the address in the tag to see if a number is presented.



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In order for the panel to change to a screen number commanded by the PLC the following conditions must be met:

1. The number in the tag or address must change from whatever value was in the register previously before the panel will evaluate the number to see if it's a valid screen number.
2. The new number in the register must be a screen number that exists in the panel. If an invalid screen number is entered then the panel will do nothing.

Issues arise if the PLC is writing a number into the "Switch to Screen Number" address that was already there. Since the number doesn't change, the panel never examines it again. Typically, the problem occurs because of the following situation:

1. The PLC ladder code directs the panel to switch to a specific screen number by writing the screen number into the register or address defined by the "Switch to Screen Number" parameter.
2. The panel changes to the commanded screen because the number in the "Switch to Screen Number" address changed value and the panel determined that it was a valid screen number.
3. The operator, after interacting with the displayed screen, uses a Screen Change pushbutton located on that screen, or through the press of a function key in the case of the non-touch version of the CMore Micro, to change the screen from the commanded PLC screen to another screen.
4. The PLC ladder code again requires the previously commanded screen to be display so it writes the same screen number as it did the previous time into the "Switch to Screen Number" address.
5. Since the same number was already in the address, however, the panel doesn't see the number change and therefore doesn't return to the screen commanded by the PLC.

We can prevent the situation described above from happening by using another parameter in the CMore/CMore Micro panel and a few rungs of ladder logic (three rungs for Koyo PLCs). In addition to using the "Switch to Screen Number" parameter we need to create a tag name for the parameter "Current Screen", which is located in the **Setup / PLC <--> Panel / Panel to PLC / Current Screen**. Create a tag for this that points to a different register in the PLC using the same data type as the "Switch to Screen Number" tag. This parameter is used by the CMore/CMore Micro panel to write the "Current Screen" number that the panel is displaying into the assigned address in the PLC. We also need to assign an unused register in the PLC to hold the "Last Called Screen" value, which will be the same data type as the "Switch to Screen Number" value. Basically, our logic will test whether the "Switch to Screen Number" is different from the "Current Screen" number because it was changed by ladder logic code in the PLC or if it is different from the "Current Screen" value because the operator changed the screen from a change screen object on the panel. If the screen is changed by the PLC, then



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the logic waits for the panel to go to the commanded screen. If the screen is changed by the operator, the logic makes the value in the "Switch to Screen Number" register and the "Last Called Screen" register follow the operator commanded screen. Here's the logic to make this happen:

1. On the first scan of the ladder logic copy "Current Screen" to "Switch to Screen Number" and "Last Called Screen"
2. If "Switch to Screen Number" = "Last Called Screen" AND "Switch to Screen Number" <> "Current Screen" THEN copy "Current Screen" to "Switch to Screen Number"
3. If "Switch to Screen Number" <> "Last Called Screen" AND "Switch to Screen Number" = "Current Screen" THEN copy "Switch to Screen Number" to "Last Called Screen"

The above logic will allow the "Switch to Screen Number" value to follow the "Current Screen" value when the operator is changing the screen. When the PLC changes the "Switch to Screen Number" value, however, the logic will wait until the screen switches to the commanded screen before updating anything else. Once the panel goes to the commanded screen, however, the logic will continue to change the "Switch to Screen Number" register to match the screen the operator is viewing.

Technical

Assistance: If you have questions regarding this Application Note, please contact us at 770-844-4200 for further assistance.