750/760 Local/Remote Control without using the Faceplate Pushbuttons

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Introduction

OVERVIEW

This Application Note provides instructions and setting information for the 750/760 relay for local/remote operations, where local operations are not controlled through the relay front panel.

In this document, the following terms apply:

- **Local** refers to commands performed at the local substation by means of control switches at the local panel. It does not mean operations via the CLOSE or OPEN pushbuttons at the relay front panel
- **Remote** refers to commands generated via communications, at a remote location.

ASSUMPTIONS

The instructions in this document assume that:

1. The remote signal is received as a virtual input at the relay via RS485 serial communications.
2. Logic Input 13 will be used to block the trip output only when the station is in local mode *and* a remote signal is received via communications as Virtual Input 13.
3. Logic Input 14 will be used to block the close output only when the station is in local mode *and* a remote signal is received via communications as Virtual Input 14.
4. The user is not using Logic Input 13 for source trip, suggested as optional in the transfer scheme.
5. Another alternative is to use Logic Input 12, as long as it is not used as transformer lockout in the transfer scheme.
6. Logic Input 2 will be used as contact or virtual input for remote close.
7. Logic Input 3 will be used as contact or virtual input for remote trip.
8. The user is also using the 750/760 in an auto transfer scheme operation.
9. There will be a selector switch used to select between local and remote operation.

Instructions

LOGIC INPUT SETTINGS

The remote computer will be issuing a remote close command via Virtual Input 2, and a remote trip command via Virtual Input 3.
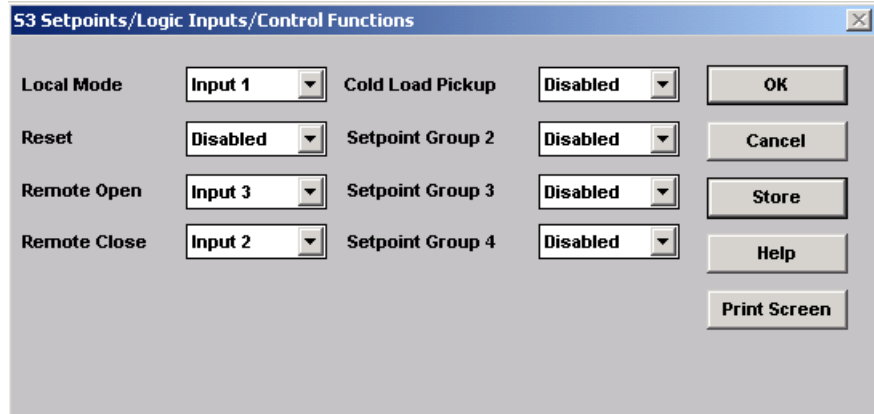

FIGURE 1. Logic Input Settings for Open and Close Operations

Closing a contact or a string of contacts that will assert Logic Input 2 for close and Logic Input 3 for trip, will be used to generate local commands, via Logic Inputs 2 and 3.

Logic Inputs 2 and 3 should be set for asserted logic "Close or Von", indicating that commands will be executed either via the closing of a contact, or by receiving a remote command as a virtual input.
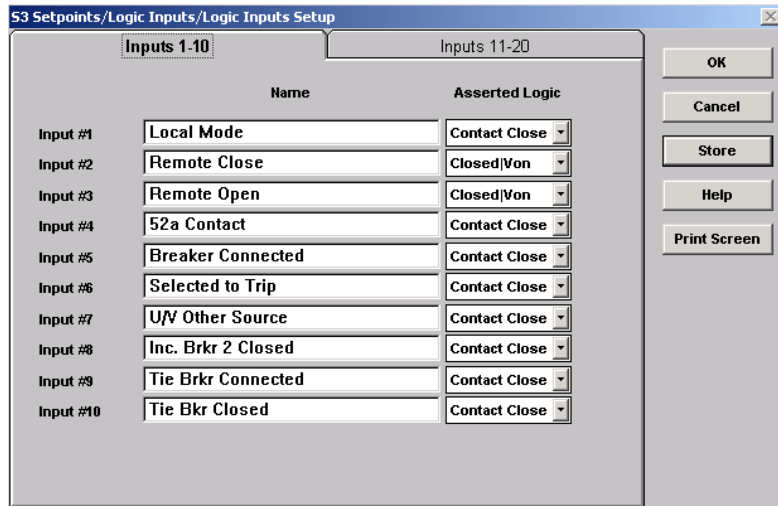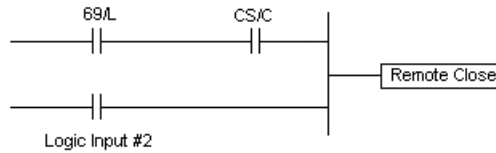

FIGURE 2. Logic Inputs 1 to 10 Settings

LOCAL AND REMOTE LOGIC

The logic for Local and Remote commands are as follows.

*   **Close Command**: Local command executed when contacts 69/L (station in local) and CS/C are closed, or remote command executed via a Virtual Input received at Logic Input 2.

Therefore, Login Input 2 will respond to both the closing of contacts 69/L and CS/C, or when receiving Virtual Input 2.

*   **Trip Command**: Local command executed when contacts CS/T is closed, or remote command executed via a Virtual Input received at Logic Input 3.
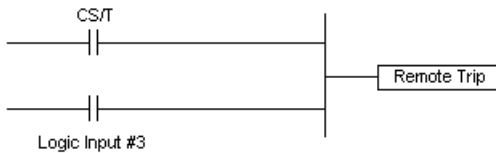
Therefore, Login Input 3 will respond to both the closing of contact CS/T or when receiving Virtual Input 3.

Since remote commands are not wanted when the Local/Remote switch is in Local, it is necessary to make provisions for additional logic preventing remote commands to be executed under such circumstances. Logic Inputs 13 and 14 are used to achieve this. The settings for Logic Inputs 11 through 20 are shown below:
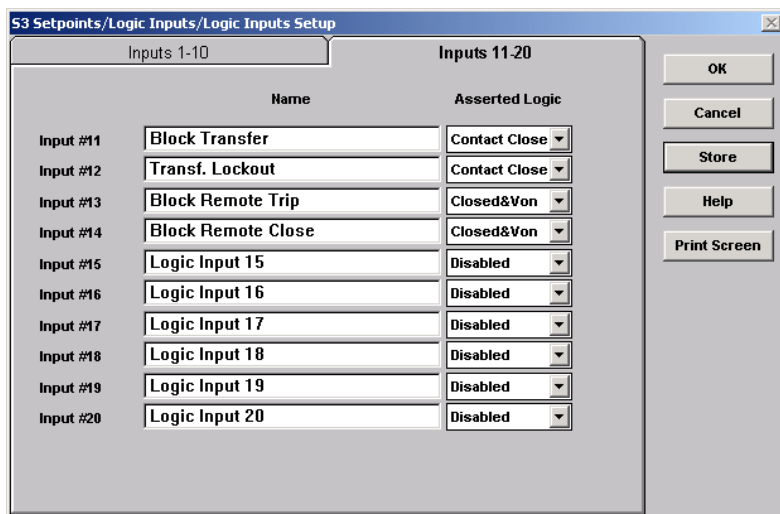

FIGURE 3. **Logic Inputs 11 to 20**

Please note that Logic Inputs 13 and 14 should be set as "Close & Von", indicating that the corresponding logic Input will be considered asserted only when the contacts connected to terminals D6 and D7 are closed, and a virtual input is received at the same time. The fact that a close contact is connected to the terminals does not imply a blocking command will be executed, unless the virtual command is received simultaneously.

In preparation for a remote operation, the master computer has to send a virtual command to verify that the station is *not* in Local mode. If Virtual Input 13 or 14 is received when the Local/Remote switch is in Local mode, the 750/760 will indicate that the corresponding output relay is blocked.

If the execution of this first remote command does not yield any indication that the Trip or Close relays are blocked, then the second command can be sent, which will be the one to trip or close the breaker.

If the Local/Remote control switch is in Local, the Trip relay will be blocked when Virtual Input 13 is on, as indicated below:
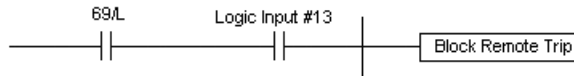

FIGURE 4. Block Trip Logic for Remote Trip Command in Local Mode

If the Local/Remote control switch is in Local, the Close relay will be blocked when Virtual Input 14 is on, as indicated below:
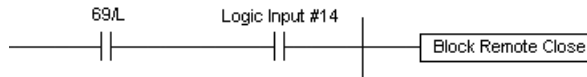

FIGURE 5. Block Trip Logic for Remote Close Command in Local Mode

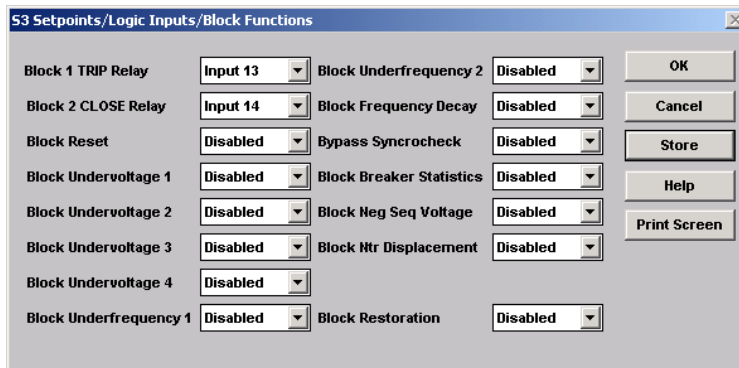The settings for the Block Functions are shown below:

FIGURE 6. Logic Input Settings for Blocking Commands

WARNING

The success of this application depends on the master control center sending two simultaneous virtual inputs to the relay when a remote command is about to be issued:

*   One virtual input verifies that the substation is in Remote mode. If it is in Local mode, this input will be used to block the operation of the Trip and Close relays. This command shall be maintained until the indication that the breaker has changed status is received at the master control center.
*   The other virtual input executes the remote command.

The verification command should be issued first, and at the second command after a time delay, to allow a message to return from the 750/760 in case the station is in Local mode.

Ideally, the verification command should be maintained at all times when the master control center has taken control of the station from Remote.

WARNING

If the first command is not received, the second command will be executed regardless of the status of the Local/Remote switch.

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