



Cooperative Operation of the ControlNet Ex Adapter and FLEX Ex Output Modules

The ControlNet Ex adapter (1797-ACNR15) combined with FLEX Ex output modules provides a two-tier fault state mechanism. It is important to consider and understand the operation of this mechanism when designing your system.

Two sets of programmable fault states are available, one each in the adapter and output module. This two-tier method is meant to give you a wider fault coverage compared with normal methods.

ControlNet Ex Adapter Operation

Network Communication Monitoring

The adapter is the primary monitor of network activity. If it detects loss of network communication, it can be programmed to:

- continue writing the last valid received data to the module (hold last state)
- apply local module safe states¹
- write a programmable fault state value to the module, depending upon the module type

This mechanism primarily targets fault behavior for loss of network communication.

Program Mode Behavior

The adapter also monitors the state of the controlling processor or scanner. Two states can be detected: run mode and program mode (idle).

When run mode is detected, the adapter writes the output data received from the processor to the corresponding module output.

When program mode is detected, the adapter can be configured to:

- continue writing the last valid received data to the module (hold last state)
- apply local module safe states to zero¹
- write a programmable fault state value to the module, depending upon the module type

¹ This selection is shown as "Reset Outputs" in RSNetWorx but its action in "Apply Local Module Safe States".

FLEX Ex Output Module Operation

Flexbus Communication Monitoring

The module monitors flexbus communication activity and the state of its Output Enable bit. If it detects loss of flexbus communication activity or the Output Enable bit transitioning to 0, it can be programmed to:

- continue writing the last valid received data to the outputs (hold last state)
- reset the outputs
- write the local module fault state value to the output, depending upon the module type

This mechanism primarily targets fault behavior for loss of backplane communication.

Power-Up State Behavior

The system and modules use the Output Enable bit at system power-up. The power-up state of the Output Enable bit is 0 and must be transitioned to 1 through application program control to initialize activity of a module's outputs.

Before the Output Enable bit is transitioned to 1, module outputs remain off. Once the initial power-up and application-program control transitions the Output Enable bit to 1, and module output activity begins, subsequent transitions of the Output Enable bit by any source will cause the output module to apply the local module fault state.

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Americas Headquarters, 1201 South Second Street, Milwaukee, WI 53204, USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444
European Headquarters SA/NV, avenue Herrmann Debroux, 46, 1160 Brussels, Belgium, Tel: (32) 2 663 06 00, Fax: (32) 2 663 06 40
Asia Pacific Headquarters, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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