

OPALARM

Acknowledging Alarms in a Siemens Text OP

with a Function Block Written for a Siemens S5 PLC

An Automation List PLC Archive Document

- **Author:** Michael Griffin
- **Document Date:** 23-JUL-2000
- **Date Originally Written:** 1997
- **Type:** PLC subroutine.
- **PLC Model:** Siemens S5 series (used with Siemens text OP).
- **Application History:** More than 3 dozen systems in current use.
- **Known Problems:** None.
- **Current Revision:** Original version.
- **Algorithm Source:** The algorithm was created for this application.

This document describes a simple method of acknowledging alarms in a Siemens text OP (operator panel with display and keypad). These OPs include the OP20, OP5, OP15, OP7, or OP17. OP "alarms" are an easy method of displaying and acknowledging faults.

Alarm messages are entered into the OP using the appropriate software (e.g. Comtext or Protocol). When the PLC program sets a bit which has been defined as being part of an alarm word (which may be a flag word or data word), the OP displays the appropriate alarm message. When the operator presses the "Alarm Acknowledge" key on the OP, the OP sets an "alarm acknowledge bit" in the PLC which corresponds to the particular alarm which was acknowledged. At this point it is up to the PLC program to reset the original alarm bit.

Each alarm (fault) requires one alarm bit, and one alarm acknowledge bit. This means that one alarm word can be used to trigger up to 16 independent fault messages.

This function block makes this task easy by automatically resetting alarm bits when the corresponding alarm acknowledge bit is set. The algorithm used works on whole words at once, allowing up to 16 alarms to be individually handled by one function block call. This block can be called as many times as necessary with different parameters to handle additional alarms.

Application Example

The following is an example showing the function block being called from within a program block. Notice that it is being called unconditionally. In this example, the OP uses data words in data block DB42 as its interface area.

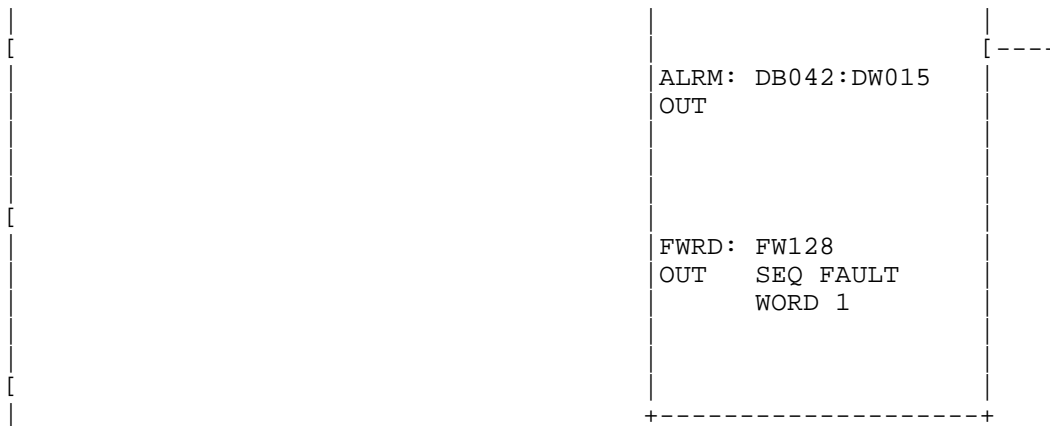
- **DB042:DW025** is the "Alarm Acknowledge word". This is the word the OP uses to signal when an alarm has been acknowledged.
- **DB042:DW015** is the "Alarm Word". This is the bit the PLC sets to trigger the display of an alarm on the OP.
- **FW128** is a word which other logic elsewhere in the program sets to indicate an alarm (fault) condition.

This function block can be called as many times as necessary, but of course different parameters must be used with each instance. I typically put these calls into a program block (PB) which contains other miscellaneous OP functions.

SEGMENT 11

The OP will signal the PLC when the operator acknowledges a fault.
This function block will reset the original fault bits.

<pre> +JUMP TO SUBROUTINE--+ FB213 OPALARM OP ALARM CONTROL ----- OPAK: DB042:DW025 IN </pre>
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Algorithm

The following is the actual statement list source code for the function block. The algorithm consists of the following:

- 1) Invert (complement) the OP alarm acknowledge word.
- 2) AND it with the fault word.
- 3) Reset the alarm acknowledge word to zero.
- 4) Overwrite the OP alarm word with the modified fault word.

The "fault word" (FWRD) parameter is used simply because it was convenient on an S5 PLC to group the OP data areas in a data block, while using flag words to hold the decoded fault conditions (set elsewhere in the program). The "fault word" (FWRD) and "alarm word" (ALRM) are essentially the same. The algorithm used does not require this distinction, but the addressing methods used in an S5 PLC made it easier to do so.

FB Source Code

FB213

```

                                OPALARM          1997
This block resets faults which are signaled as alarms to the OP.
When the OP acknowledges these faults (when the operator presses the
acknowledge button), the OP signals the PLC to reset these faults.
SEGMENT 1

NAME: OPALARM
DECL: OPAK I, W                ;OP Alarm Acknowledge word.
DECL: ALRM Q, W                ;OP Alarm input word.
DECL: FWRD Q, W                ;PLC fault word which triggered alarm.
: L   =OPAK                    ;Load OP acknowledge word.
: CFW                            ;Invert the acknowledge word to form a mask.
: L   =FWRD                    ;Load the fault word.
: AW                                ;Reset the faults
: T   =FWRD                    ;Write out the modified fault word.
:
: L   KH 0000                  ;Reset the OP alarm acknowledge.
: T   =OPAK
:
: L   =FWRD                    ;Transfer the PLC fault word to the
: T   =ALRM                    ;OP alarm monitor word (input to OP).
: BE

```

Note: I have not experienced any problems with the program code in this document in my own applications so far. I have provided this example for illustrative purposes only. You are free to use the information in this document for your own purposes, but in doing so you must of course accept complete responsibility for any problems, bugs, unintended consequences, etc. you may encounter. In other words, use at your own risk.