

# Application Note:

## New Features in 2500 Series™ Processors, V6.02 Firmware



### Overview

Version 6.02 Firmware for the CTI 2500 Series™ Processor contains significant enhancements to the Special Function programming capabilities:

- Password protection for Special Function subroutines.
- Additional instructions for controlling logic flow
  - ✓ For/Next Loops
  - ✓ While/Endwhile loops
  - ✓ Switch/Case statements
- Bit of Word access for expressions
- Increased the number of temporary (T) memory elements to 64
- Increased the number of subroutine parameters to 10

The addition of these capabilities increase the range of applications that can be programmed and simplify the programming of complex logic. Coupled with the increased performance offered by the 2500 Series compiled Special Function Language, these new features allow SF subroutines to be used instead of external subroutines (XSUBs) for proprietary applications such as gas flow calculations.

PLC Workshop Version 4.50 or greater is required to program, save or load a user program that makes use of the new features.

### Feature Details

#### ***Password Protection***

The Password Protection feature allows a programmer to assign a password to any Special Function subroutine. If a Special Function subroutine is password protected, it can be executed but cannot be displayed or edited. Password protected Special Function subroutines can be distributed by using “Copy/Paste” facility in Workshop to transfer from one user program to another or by using the new Special Function “Import/Export” feature in Workshop 4.50.

#### ***For/ Next Loops***

The FOR/NEXT loop allows the programmer to repetitively execute a group of instructions for a specified count. The programmer can specify the initial value and address of the counter (V or T memory), the step by which the count will change after each loop iteration, and the condition for exiting the loop. For-Next Loops can be nested up to four levels deep.

#### ***While/Endwhile Loops***

The While statement allows the programmer to repeat a group of instructions, delineated by the While and Endwhile statements, as long as a condition specified by the programmer is true. While/Endwhile loops can be nested up to 4 levels deep.

## ***Switch/Case Statement***

The Switch statement, used in conjunction with the Case statement, compares the result of an expression to a set of integer values representing each Case statement. The Switch statement can improve execution speed and efficiency as compared to complex nested IF statements.

The Switch statement evaluates the expression specified by the programmer and then jumps to a Case statement whose constant variable matches the result of the expression. If there is no matching Case statement, the Switch statement will jump to a Default case, if provided. Otherwise, the Switch is terminated and execution jumps to the statement following the Endswitch statement.

Switch Statements can be nested up to 7 levels deep.

## ***Bit of Word Access***

Bit of Word access allows certain SF instructions to directly access a specific bit in a word address. This capability reduces the complexity of SF programs and subroutines that need to read or write a bit of word. Element indexing has been enhanced to support Bit of Word addresses.

## ***Increased Temporary Memory***

Increasing the number of temporary memory elements from 16 to 64 provides additional local variable storage and simplifies the task of writing subroutines that are portable between all user programs. This capability is especially important when delivering password protected subroutines.

## ***Increased Special Function Subroutine Parameters***

Increasing the number of Special Function Subroutine parameters from 5 to 10 provides more flexibility in controlling the execution of subroutines. This capability is especially important when delivering password protected subroutines.



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