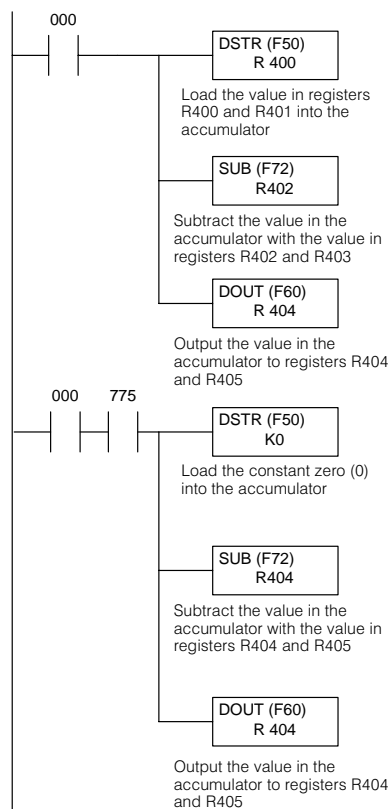


Subtract Example The following examples demonstrate how the discrete status flags are used to indicate if the result of the Subtraction is a 0 or required a borrow digit. The following table shows different values being used in the logic example below. Notice how the discrete status flags change for each example.

	Registers for DSTR Instruction R401/R400	Registers for SUB Instruction R403/R402	Registers for DOUT Instruction R405/R404	Discrete Status Flag 775	Discrete Status Flag 776
Example 1	6050	5000	1050	off	off
Example 2	7050	7050	0000	off	on
Example 3	5000	6000	9000*	on	off

* The DL305 cannot process negative numbers. When the number being subtracted from the accumulator is larger than the number in the accumulator, a borrow digit occurs and the subtraction is completed. The value in the accumulator does not represent the difference between the two numbers. To get the difference between the two numbers in Example 3 the result (9000) in the accumulator is subtracted from 0. The final result is 1000, the difference between 6000 and 5000.

DirectSOF Display



Handheld Programmer Keystrokes

STR	SHF	0	ENT
F	5	0	ENT
R	4	0	0 ENT
F	7	2	ENT
R	4	0	2 ENT
F	6	0	ENT
R	4	0	4 ENT
STR	SHF	0	ENT
AND	SHF	7	7 5 ENT
F	5	0	ENT
R	4	0	4
F	7	2	ENT
K	0		ENT
F	6	0	ENT
R	4	0	4 ENT

NOTE: It is a common mistake to just use the status flags without interlocking to control outputs in a program, but the status flags can change several times during the same scan. Just as you should not use the status flags by themselves to control outputs, you also should not monitor status flags within the program. Instead you should monitor the interlocked outputs controlled by the status flags.

**Multiply
MUL (F73)**

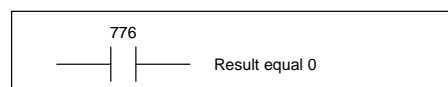
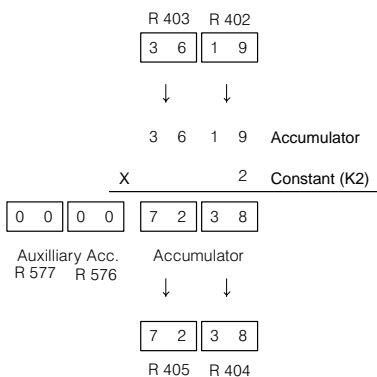
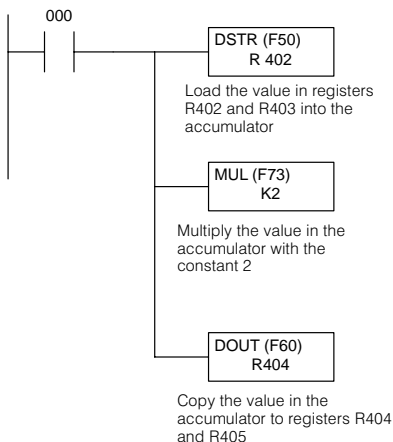
The Multiply (F73) is a 16-bit instruction that multiplies the value in a 16-bit register, two consecutive 8-bit registers, or a 4-digit BCD value by the value in the accumulator. The least significant four digits of the result are stored in the accumulator and the most significant four digits are stored in the auxiliary accumulator (R575 and R577). A discrete bit flag is used to indicate if the result was zero.

MUL (F73)
A aaaa

Data Type		D3–330 Range	D3–340 Range	D3–330P Range
A		aaaa	aaaa	aaaa
Inputs / Outputs	R	000–014 070–075	000–014 070–075	000–014 070–075
Control Relays	R	016–036	016–036 100–105	016, 020–027
Shift Registers	R	040–056	040–056	—
Stages	R	—	—	100–116
Timer /Counters (16 bit)	R	600–677	600–677	600–677
Data Registers	R	400–577	400–577 700–777	400–577
Constant (4-digit BCD)	K	0000–9999	0000–9999	0000–9999

Discrete Bit Flags	Description
776	Will be on if the result is 0

In the following example, when input 000 is on the value (3619) in R402 and R403 is loaded into the accumulator using the Data Store (F50) instruction. The data in the accumulator is multiplied with the constant K2 with the result residing in the accumulator and auxiliary accumulator (R576 and R577) using the Multiply (F73) instruction. The value in the accumulator is output to data registers R404 and R405 using the Data Out (F60) instruction.

DirectSOFT Display**Handheld Programmer Keystrokes**