User Sequence for G100 Drives

LS ELECTRIC America

G100 User Sequence
Version: 1.00
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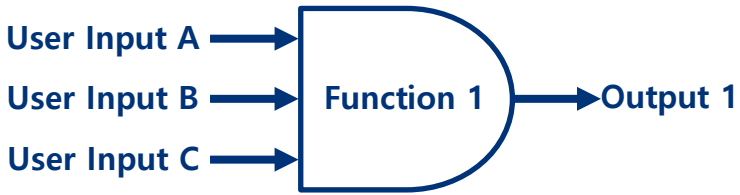
Introduction

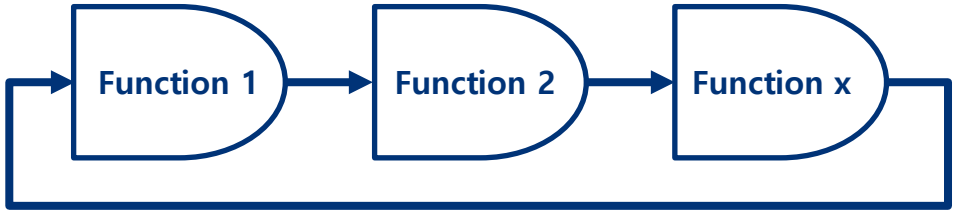
The **User Sequence** for G100 drives is a feature where function blocks are used to create an internal, mathematical logic sequence without the use of a PLC.

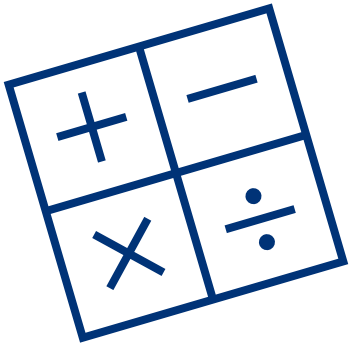
- Functions include adding, multiplying, comparing, and several others using input variables from within the drive.
- A function block is comprised of 2 to 3 input values and one output value.
- Up to 18 function blocks may be used with 28 different functions.
- The User Sequence is great for specialized machinery and many types of applications!



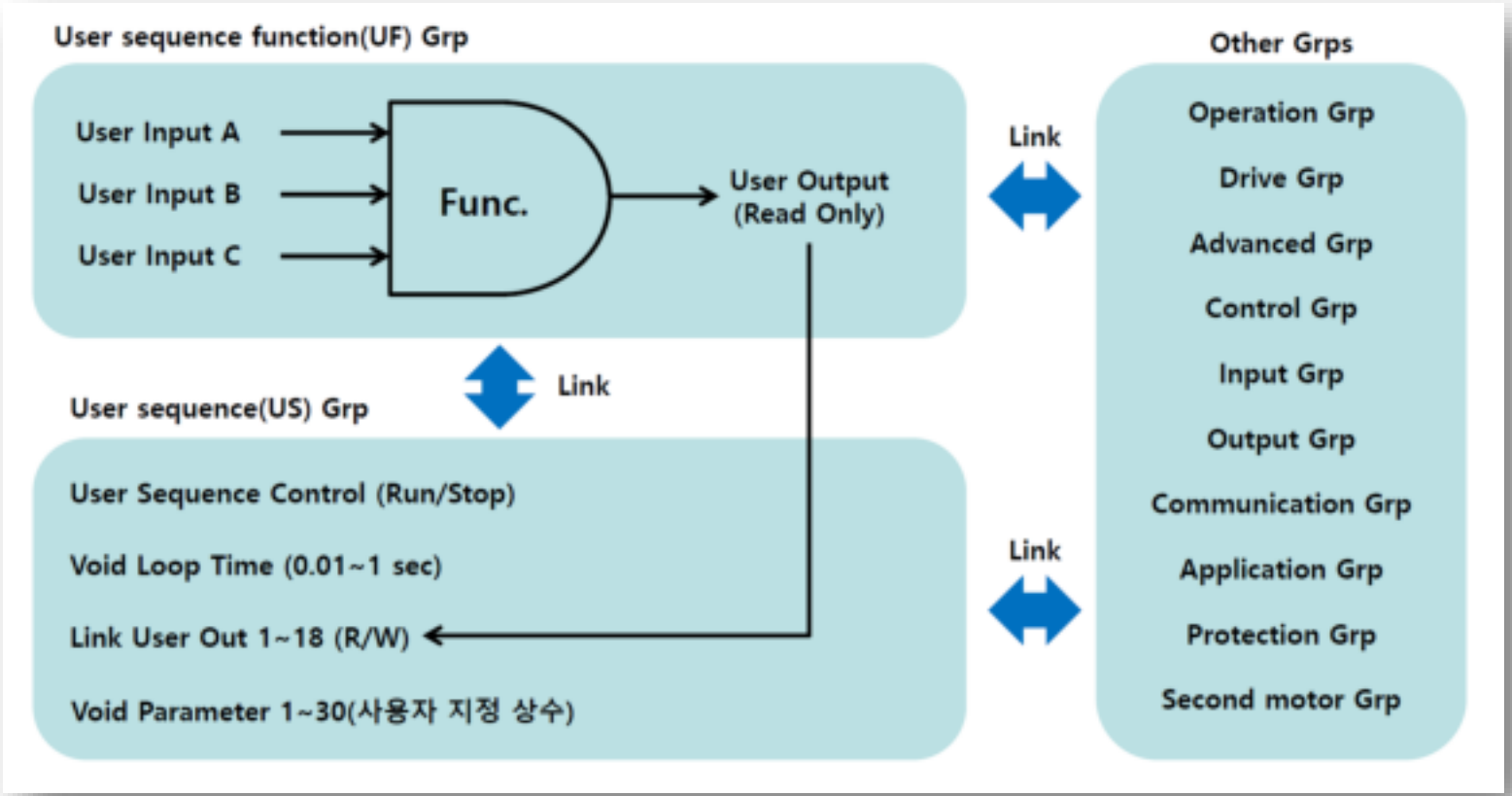
How does the User Sequence Work?

- The drive runs the User Sequence as a loop starting with Function 1 and ending with the last function.
- A digital input can be used to activate the User Sequence or it can run automatically in the background.
- All functions including the inputs, constants, and output links are set in the parameters of the drive.
- The output from the function block is a read-only value which can be used for the frequency reference, PID feedback, input to another block, etc.
- For example, the input to a function block may be the value from V1 analog input AND I2 analog input. The output may be used as the frequency reference.





The Big Picture



Parameter Overview

The **User Sequence** parameters mainly consist of the **US** and **UF** groups.

- Set parameter **AP-02** to "**1**" to enable the User Sequence and to access US and UF parameters.
- Set parameter **US-01** to "**1**" (Run) or "**3**" (Digital Input Enable) when ready to run the User Sequence.
- Set parameter **US-02** to change the loop time.
- The **US group** consists of constants (void) and output links to other parameters.
- The **UF group** consists of the function blocks and inputs to the function blocks.

Parameter	Name	Description
AP-02	User Sequence Enable	Enables/disables the User Sequence Function.
IN.xx	Px Digital Input Function	Allows a digital input (Px) to start/stop the User Sequence when US-01=3. Set IN-xx = 50.
US.01	User Sequence Control	Determines how the User Sequence is started/stopped.
US.02	User Sequence Loop Time	Determines the loop time (0.01 - 1sec) for the User Sequence.
US-12 to US-28	Link User Output 1 - 18	Links the outputs from the function blocks to other parameters.
US-31 to US-60	Void Parameters 1 - 30	Sets the void parameters which can be used as constants to the inputs in the function blocks.
UF-01 to UF-90	User Function/Output 1 - 18	Defines the function blocks and the associated input/output variables.

Setting Values

Parameters are set in the **US** and **UF** groups as **hexadecimal addresses**.

- For example, if using V1 Monitor, set UF-xx = 1505 which corresponds to parameter IN-05.
- Use the Modbus table and parameter listing in the G100 User Manual for all addresses.

Input Function Group (PAR→In)

Code	Comm. Address	Name	Setting Range	
In-00	-	Jump Code	1~99	
In-01	0h1501	Frequency for maximum analog input	Start frequency~Maximum frequency(Hz)	
In-02	0h1502	Torque at maximum analog input	0.0~200.0 (%)	
In-05	0h1505	V1 input voltage display	-12.00~12.00 (V)	
In-06	0h1506	V1 input polarity selection	0	Unipolar
			1	Bipolar

Control Area Parameter (Read/ Write)

Comm. Address	Parameter	Scale	Unit	Assigned Content by Bit	
0h0360	Frequency command	0.01	Hz	Command frequency setting	
0h0361	RPM command	1	Rpm	Command rpm setting	
0h0362	Operation command	-	-	B7	Reserved
				B6	Reserved
				B5	Reserved
				B4	Reserved
				B3	0 → 1: Free-run stop
				B2	0 → 1: Trip initialization
				B1	0: Reverse direction command, 1: Forward direction command
				B0	0: Stop command, 1: Run command
				Example: Forward operation command: 0003h, Reverse operation command: 0001h	
0h0363	Acceleration time	0.1	sec	Acceleration time setting	
0h0364	Deceleration time	0.1	sec	Deceleration time setting	

US Group

The **US** group consists of link and void parameters.

- The **Link User Output** parameters can be linked to other registers, such as the frequency reference, accel time, etc.
  - For example, US-11 can be set to "1101" which is the address for the Command Frequency.
- The **Void** parameters are set as integer values and used in the UF group for the inputs to the function blocks.

Parameter	Description
US-11	Link User Output 1
US-12	Link User Output 2
US-13	Link User Output 3
US-14	Link User Output 4
US-15	Link User Output 5
US-16	Link User Output 6
US-17	Link User Output 7
US-18	Link User Output 8
US-19	Link User Output 9

Parameter	Description
US-20	Link User Output 10
US-21	Link User Output 11
US-22	Link User Output 12
US-23	Link User Output 13
US-24	Link User Output 14
US-25	Link User Output 15
US-26	Link User Output 16
US-27	Link User Output 17
US-28	Link User Output 18

Parameter	Description
US-31	Void Parameter 1
US-32	Void Parameter 2
US-33	Void Parameter 3
US-34	Void Parameter 4
US-35	Void Parameter 5
US-36	Void Parameter 6
US-37	Void Parameter 7
US-38	Void Parameter 8
US-39	Void Parameter 9
US-40	Void Parameter 10
US-41	Void Parameter 11
US-42	Void Parameter 12
US-43	Void Parameter 13
US-44	Void Parameter 14
US-45	Void Parameter 15

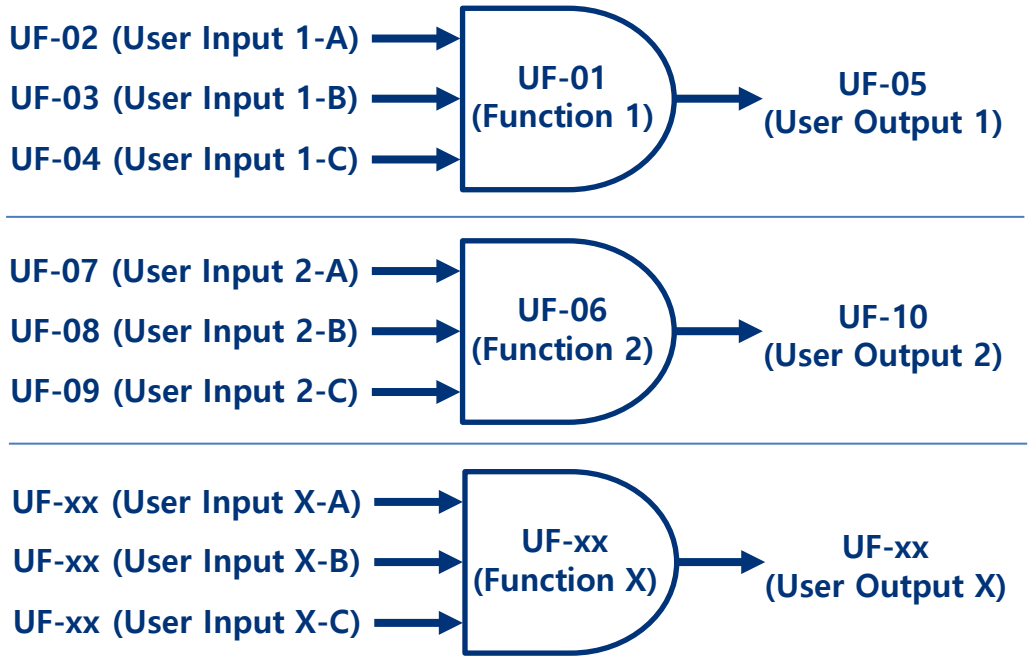
Parameter	Description
US-46	Void Parameter 16
US-47	Void Parameter 17
US-48	Void Parameter 18
US-49	Void Parameter 19
US-50	Void Parameter 20
US-51	Void Parameter 21
US-52	Void Parameter 22
US-53	Void Parameter 23
US-54	Void Parameter 24
US-55	Void Parameter 25
US-56	Void Parameter 26
US-57	Void Parameter 27
US-58	Void Parameter 28
US-59	Void Parameter 29
US-60	Void Parameter 30

UF Group

The **UF** group consists of the function block parameters.

- All input values to the **UF** group must be entered as hexadecimal addresses

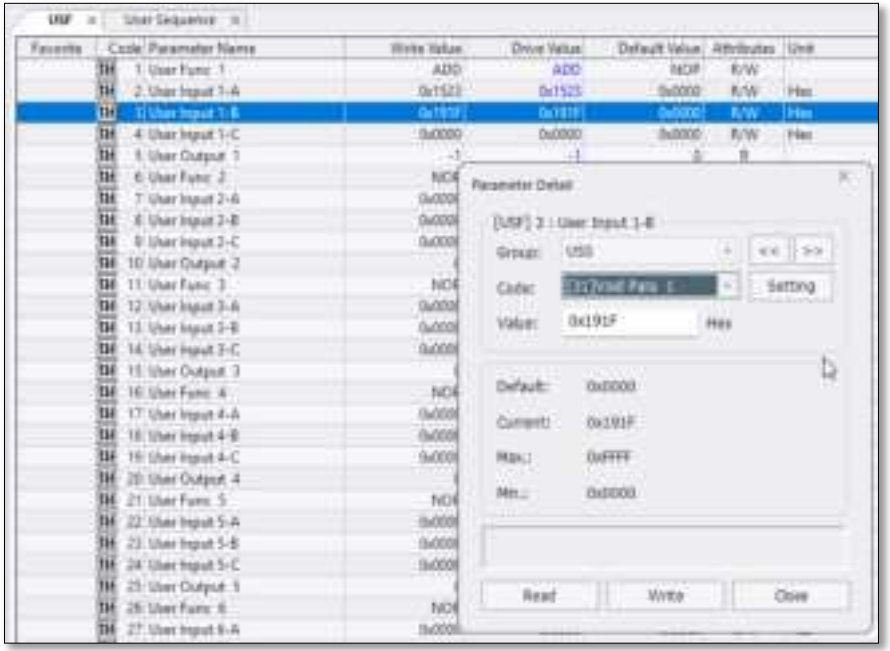
	Parameter	Description
Function 1	UF-01	User Function 1
	UF-02	User Input 1-A
	UF-03	User Input 1-B
	UF-04	User Input 1-C
	UF-05	User Output 1
Function 2	UF-06	User Function 2
	UF-07	User Input 2-A
	UF-08	User Input 2-B
	UF-09	User Input 2-C
	UF-10	User Output 2
Function X	UF-xx	User Function X
	UF-xx	User Input X-A
	UF-xx	User Input X-B
	UF-xx	User Input X-C
	UF-xx	User Output X

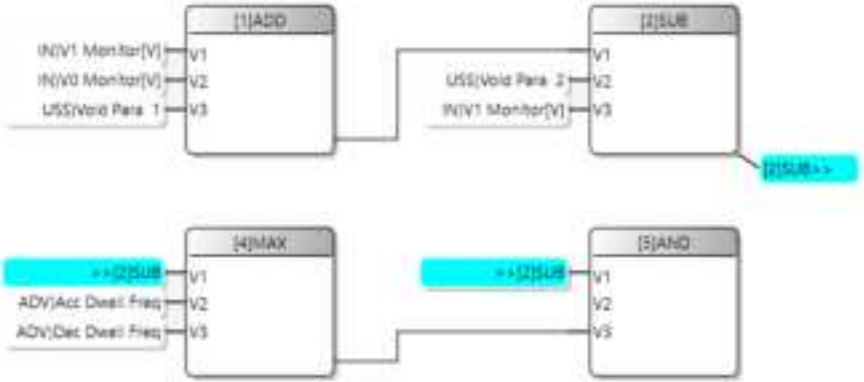


DriveView 9

Use **DriveView 9** for a more intuitive and visual programming experience.

- The hexadecimal address is automatically generated once the function or input to the block is selected.





Notes

Some important notes to consider:

- Parameters cannot be changed when the User Sequence is running (US-01 = Run or Digital Input).
- Function blocks can be used multiple times.
- Set the parameter's address in the Link UserOut X parameter to connect the function blocks. If the input value is 0x0000, an output value cannot be used.
- Void parameters can be set between -9999 and 9999.
- If the function block setting is invalid, the output of the User Output@ is -1.
- 1 loop refers to a single execution of a user configured sequence that contains a maximum of 18 steps.

Common Addresses

Address (Hex)	Parameter	R/W	Unit	Scale
1101 or 1D00*	Command Freq.	R/W	Hz	0.01
0005*	Target Freq			
0380*	Freq Command			
0009	Output Curr.	R	A	0.1
000A	Output Freq.	R	Hz	0.01
000B	Output Volt.	R	V	1
000C	DC Link Volt.	R	V	1
000D	Output Power	R	kW	0.1
0007	Acc Time	R/W	Sec	0.1
0008	Dec Time	R/W	Sec	0.1
0013	V0	R	%	0.01
0012	V1	R	%	0.01
0014	I2	R	%	0.01
0010 or 155A	DI Status	R	Bit	-
0011 or 1629	DO Status	R	Bit	-
000E	Operation Status	R	Bit	-
000F	Trip Information	R	Bit	-

* The addresses for the frequency reference are explained in the next slide

Parameter	Description	Address (Hex)
US-31	Void Parameter 1	191F
US-32	Void Parameter 2	1920
US-33	Void Parameter 3	1921
US-34	Void Parameter 4	1922
US-35	Void Parameter 5	1923
US-36	Void Parameter 6	1924
US-37	Void Parameter 7	1925
US-38	Void Parameter 8	1926
US-39	Void Parameter 9	1927
US-40	Void Parameter 10	1928
US-41	Void Parameter 11	1929
US-42	Void Parameter 12	192A
US-43	Void Parameter 13	192B
US-44	Void Parameter 14	192C
US-45	Void Parameter 15	1929

Parameter	Description	Address (Hex)
US-46	Void Parameter 16	192E
US-47	Void Parameter 17	192F
US-48	Void Parameter 18	1930
US-49	Void Parameter 19	1931
US-50	Void Parameter 20	1932
US-51	Void Parameter 21	1933
US-52	Void Parameter 22	1934
US-53	Void Parameter 23	1935
US-54	Void Parameter 24	1936
US-55	Void Parameter 25	1937
US-56	Void Parameter 26	1938
US-57	Void Parameter 27	1939
US-58	Void Parameter 28	193A
US-59	Void Parameter 29	193B
US-60	Void Parameter 30	193C

Frequency Reference

There are several addresses for the **frequency reference** to use when linking to a function block output. In addition, parameter **Frq** must be set correctly.

- When using address **1D00** or **1101** in a Link UserOut parameter, **Frq** must be set to "0" for Keypad-1.
  - If the User Sequence is stopped, the frequency can be changed from the keypad.
- When using address **0005** or **0380** in a Link UserOut parameter, **Frq** must be set to "9" for User Sequence.
  - If the User Sequence is stopped, the frequency cannot be changed from the keypad.

Address (Hex)	Parameter	Frq Setting	R/W	Unit	Scale
1D00	Command Freq.	0: Keypad-1	R/W	Hz	0.01
1101	Command Freq.				
0005	Target Freq	9: User Sequence			
0380	Freq Command				

Parameter	Description	Setting
Frq	Frequency Reference Source	0: Keypad-1
		1: Keypad-2
		2: V1
		3: V2
		4: V0
		5: I2
		6: Int-485
		8: Field Bus
		9: User Sequence

Virtual Digital Inputs

If it's necessary to toggle a digital input with the **User Sequence**, the **Virtual Digital Input** function must be used.

- Set the desired function in COM-70 through COM-77 for the corresponding Virtual Digital Input.

Parameter	Name	Description
COM-70	Virtual DI 1	Communication Multi-Function Input 1
COM-71	Virtual DI 2	Communication Multi-Function Input 2
COM-72	Virtual DI 3	Communication Multi-Function Input 3
COM-73	Virtual DI 4	Communication Multi-Function Input 4
COM-74	Virtual DI 5	Communication Multi-Function Input 5
COM-75	Virtual DI 6	Communication Multi-Function Input 6
COM-76	Virtual DI 7	Communication Multi-Function Input 7
COM-77	Virtual DI 8	Communication Multi-Function Input 8

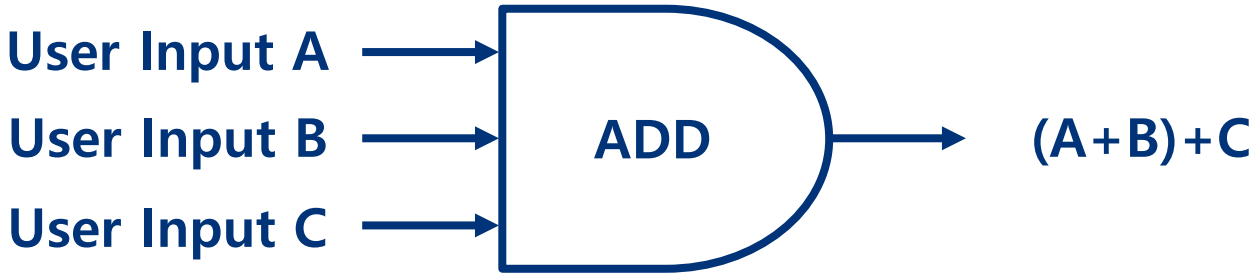
- Use the address 0x0385 to write the corresponding bit depending on which Virtual Digital Input is used.

Comm. Address	Bit (0: Off, 1: On)	Function
0h0385	0	Virtual DI 1 (COM-70)
	1	Virtual DI 2 (COM-71)
	2	Virtual DI 3 (COM-72)
	3	Virtual DI 4 (COM-73)
	4	Virtual DI 5 (COM-74)
	5	Virtual DI 6 (COM-75)
	6	Virtual DI 7 (COM-76)
	7	Virtual DI 8 (COM-77)

ADD (Addition)

The **ADD** function block follows the rule: **(A+B)+C**.

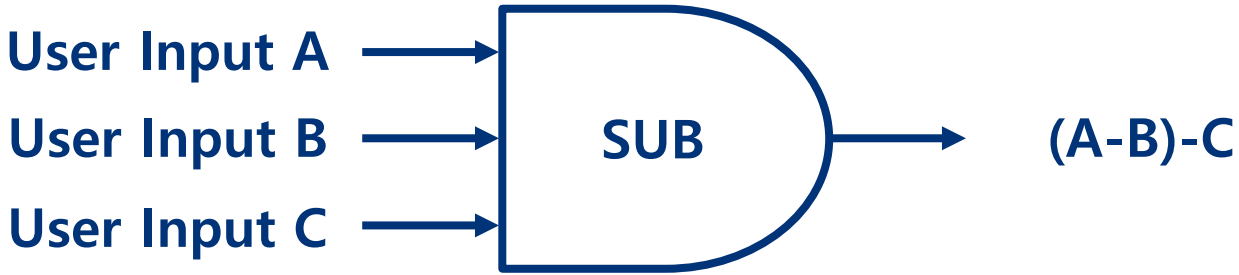
- Both User Input A and User Input B cannot be mapped to 0x0000.
- If User Input C is 0x0000, it will be equivalent to "0".



SUB (Subtraction)

The **SUB** function block follows the rule: **(A-B)-C**.

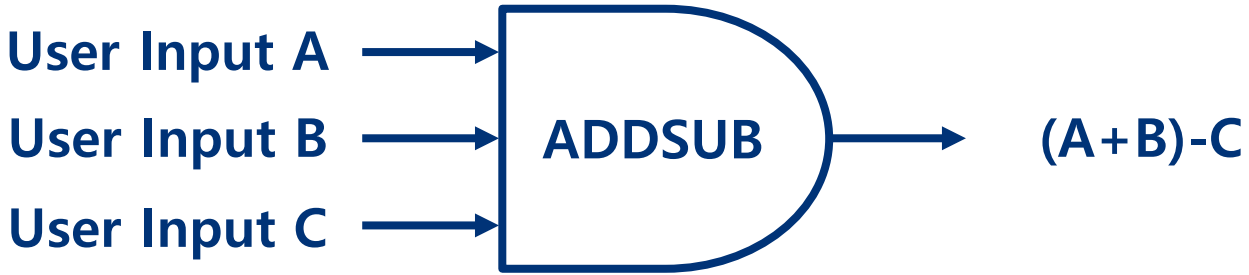
- Both User Input A and User Input B cannot be mapped to 0x0000.
- If User Input C is 0x0000, it will be equivalent to "0".



ADDSUB (Addition and Subtraction)

The **ADDSUB** function block follows the rule: **(A+B)-C**.

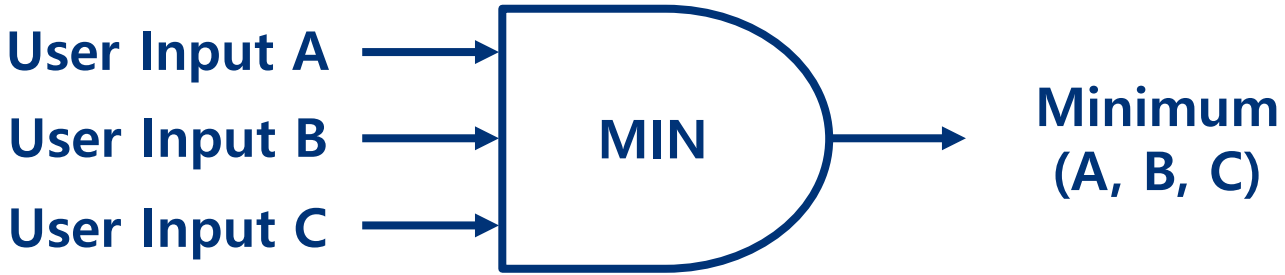
- Both User Input A and User Input B cannot be mapped to 0x0000.
- If User Input C is 0x0000, it will be equivalent to "0".



MIN (Minimum)

The **MIN** function block follows the rule where the output is the **smallest** of the input values A, B, or C.

- If User Input C is 0x0000, only User Input A and User Input B will be used.



MAX (Maximum)

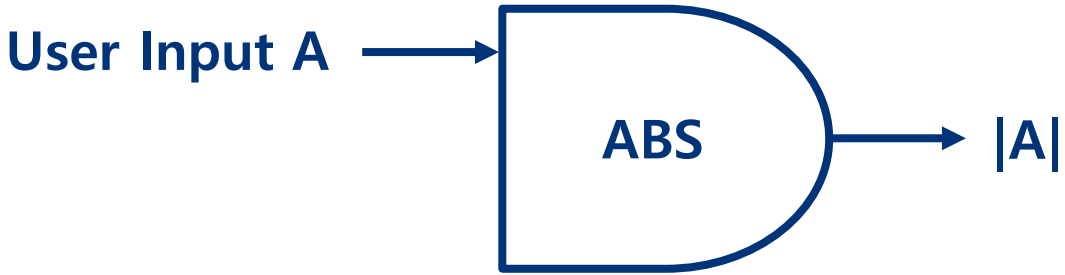
The **MAX** function block follows the rule where the output is the **largest** of the input values A, B, or C.

- If User Input C is 0x0000, only User Input A and User Input B will be used.

ABS (Absolute)

The **ABS** function block follows the rule where the output is the **absolute** value of the input value A.

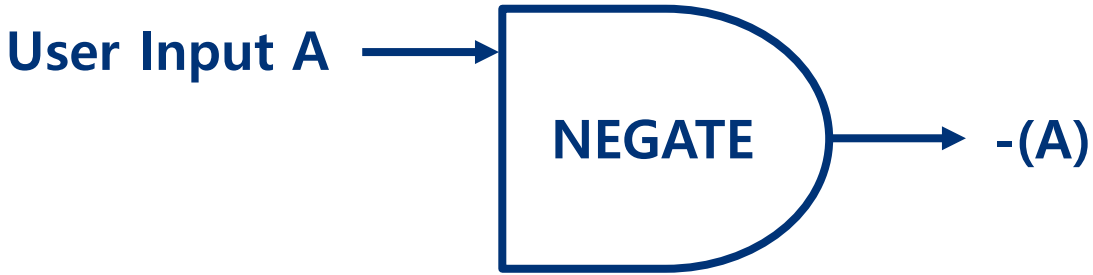
- User Input B and User Input C are not used.



NEGATE (Negative)

The **NEGATE** function block follows the rule where the output is a negative value of the input value A.

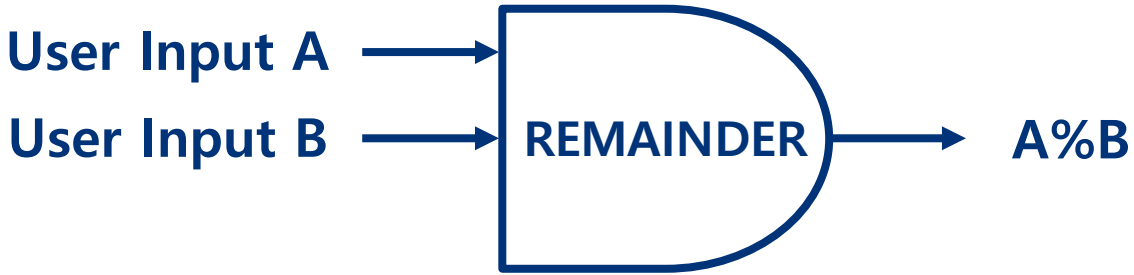
- User Input B and User Input C are not used.



REMAINDER (Remainder)

The **REMAINDER** function block follows the rule: **A%B**.

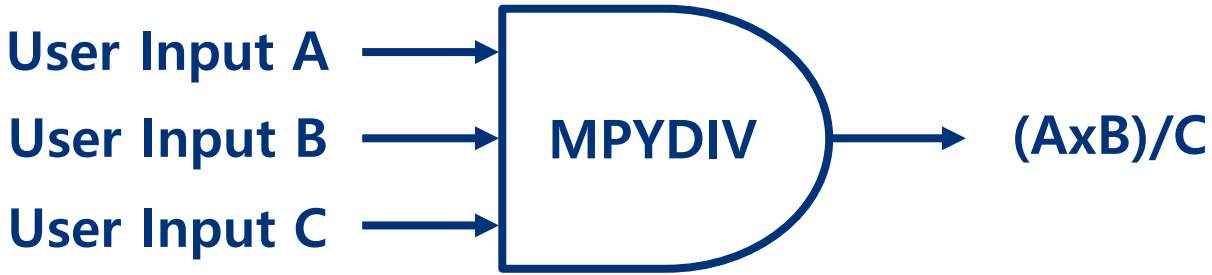
- User Input C is not used.



MPYDIV (Multiplication and Division)

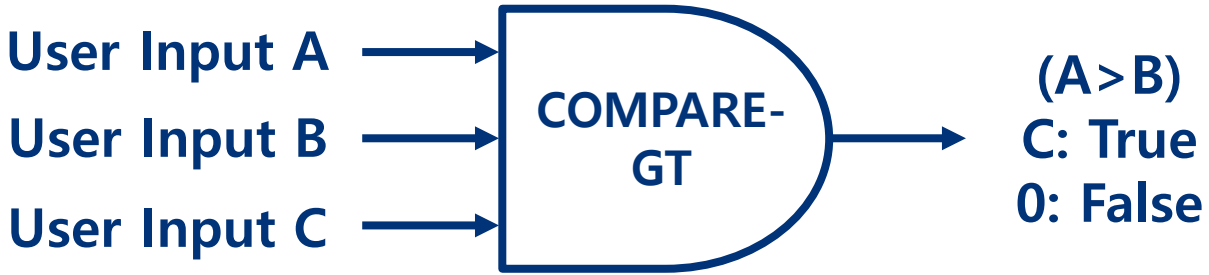
The **MPYDIV** function block follows the rule: **(AxB)/C**.

- If User Input C is 0x0000, only User Input A and User Input B will be used.



COMPARE-GT (Comparison – Greater Than)

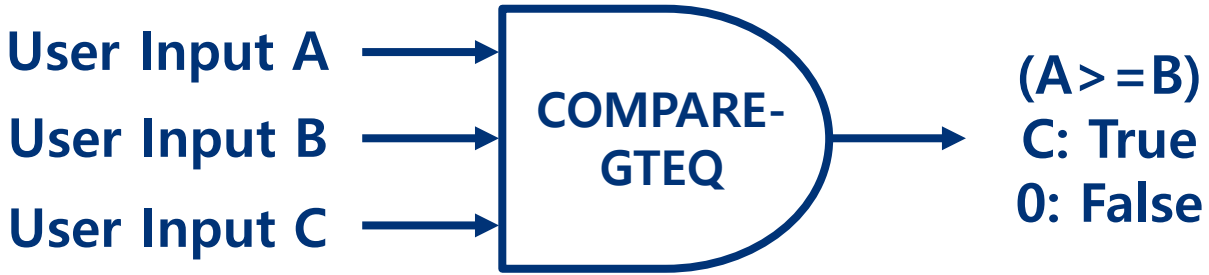
The **COMPARE-GT** function block follows the rule where if **A>B**, then the output is the value in **User Input C**. If the condition A > B is NOT true, the output is 0.



COMPARE -GTEQ (Comparison – Greater Than or Equal)

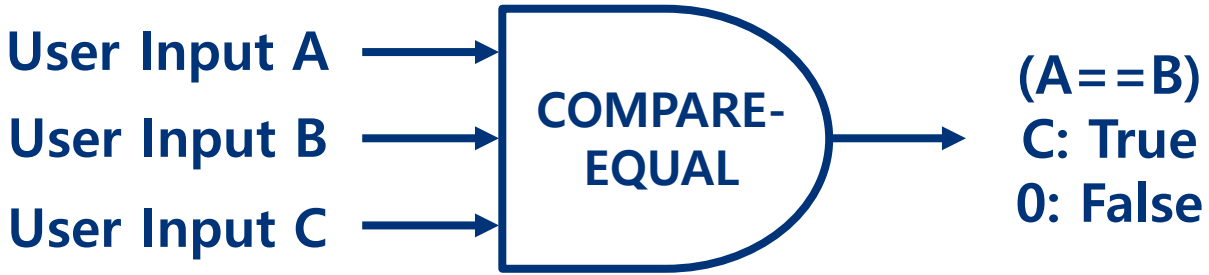
The **COMPARE-GTEQ** function block follows the rule where if **A>=B**, then the output is the value in **User Input C**.

If the condition A ≥ B is NOT true, the output is 0.



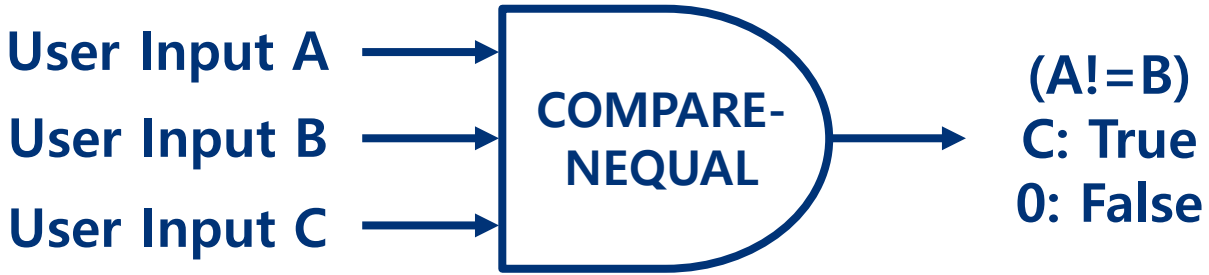
COMPARE-EQUAL (Comparison – Equal)

The **COMPARE-EQUAL** function block follows the rule where if **A==B**, then the output is the value in **User Input C**. If the condition A == B is NOT true, the output is 0.



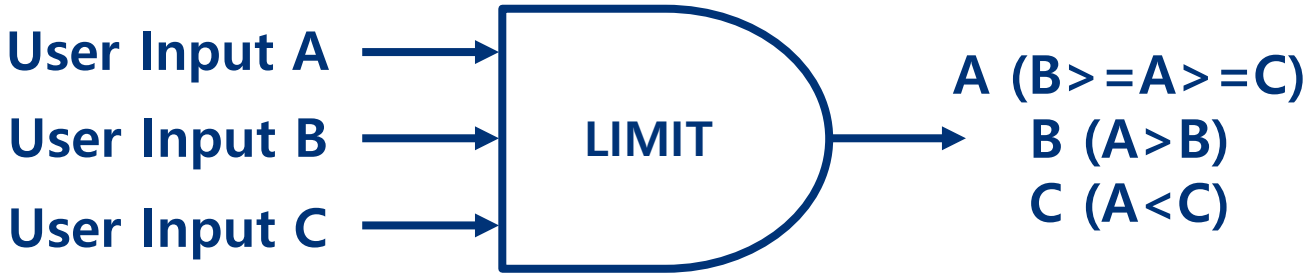
COMPARE-NEQUAL (Comparison – Not Equal)

The **COMPARE-NEQUAL** function block follows the rule where if **A!=B**, then the output is the value in **User Input C**. If the condition A == B is NOT true, the output is 0.



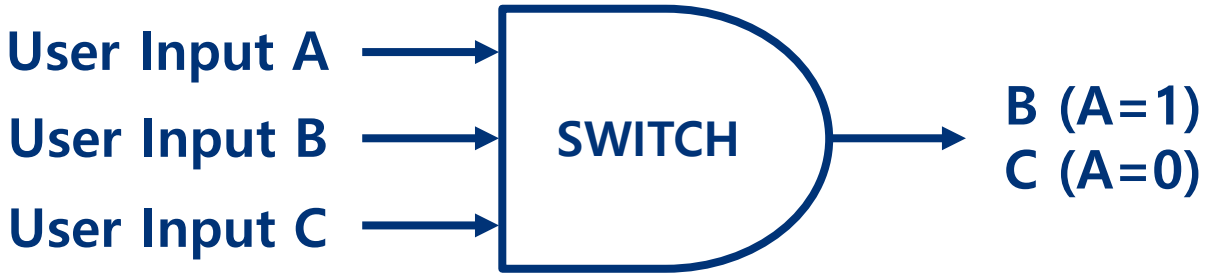
LIMIT (Limit)

The **LIMIT** function block follows the rule where if (User Input) **B>=A>=C**, then the output will be the value in **User Input A**. Otherwise, if **A>B**, then the output will be **User Input B** and if **A<C**, then the output will be **User Input C**.



SWITCH (Switch)

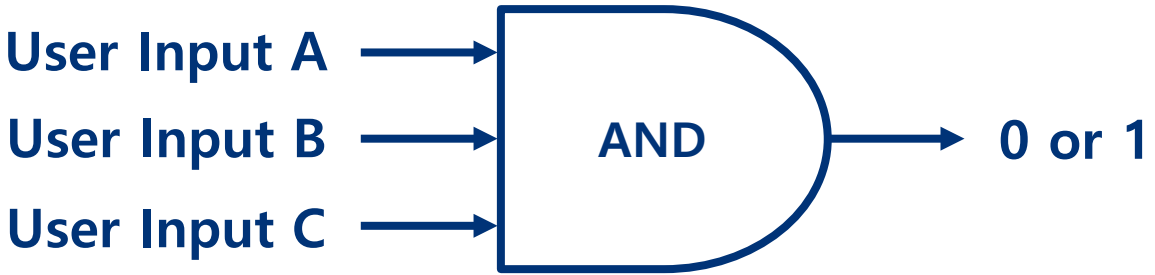
The **SWITCH** function block follows the rule where if the input at **User Input A** is **1**, then the output will be the value in **User Input B**. But, if the input at **User Input A** is **0**, then the output will be the value in **User Input C**.



AND (AND Operation)

The **AND** function block follows the rule: **(A&B)&C**. Refer to the truth table below.

- If User Input C is 0x0000, only User Input A and User Input B will be used.

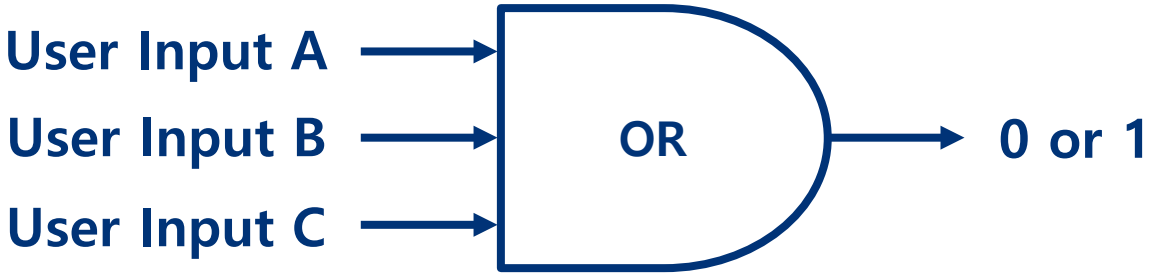


AND		Result
0	0	0
0	1	0
1	0	0
1	1	1

OR (OR Operation)

The **OR** function block follows the rule: **(A|B)|C**. Refer to the truth table below.

- If User Input C is 0x0000, only User Input A and User Input B will be used.

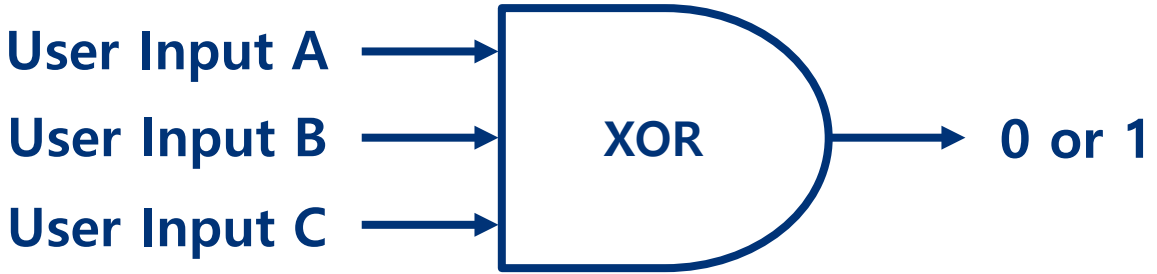


OR		Result
0	0	0
0	1	1
1	0	1
1	1	1

XOR (Exclusive OR Operation)

The **XOR** function block follows the rule: **(A^B)^C**. Refer to the truth table below.

- If User Input C is 0x0000, only User Input A and User Input B will be used.

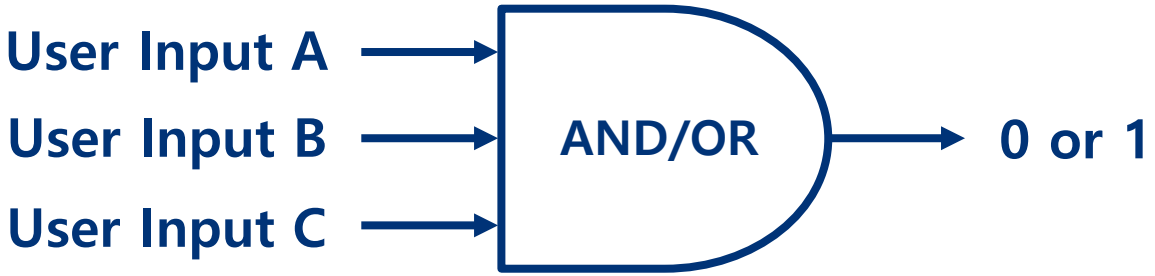


XOR		Result
0	0	0
0	1	1
1	0	1
1	1	0

AND/OR (AND/OR Operation)

The **AND/OR** function block follows the rule: **(A&B)|C**. Refer to the truth table below.

- All User Inputs must be used.

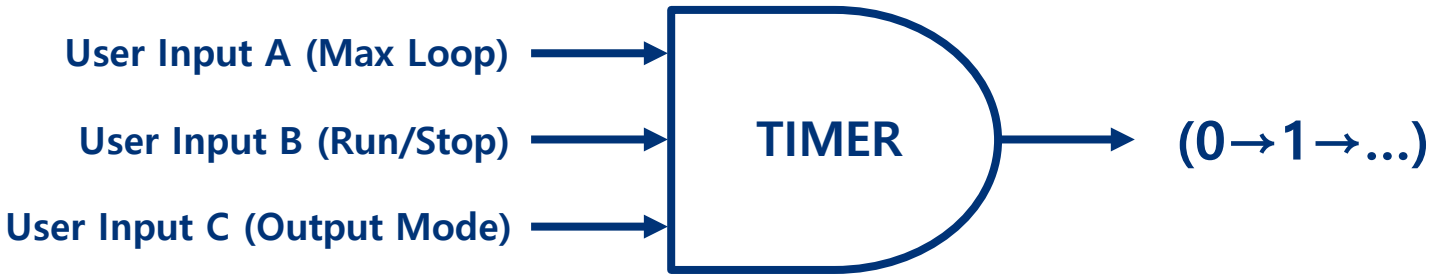


AND/OR			Result
0	0	0	0
0	0	1	1
1	1	0	0
1	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

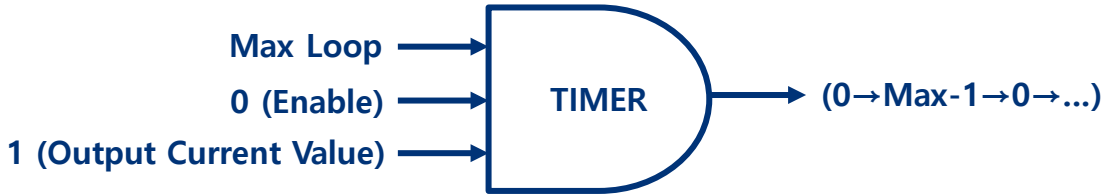
TIMER (Timer Operation)

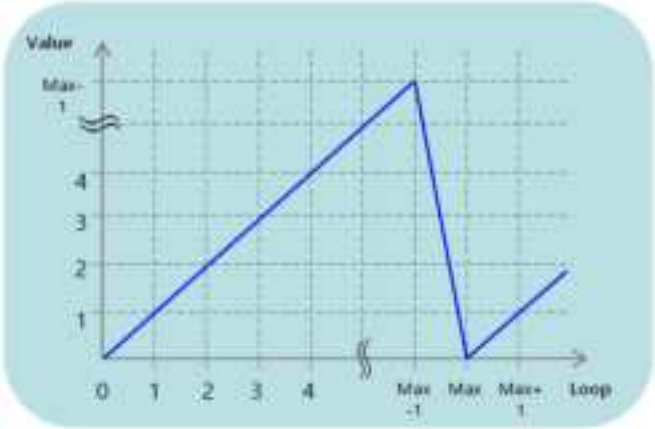
The **TIMER** function block follows the rule where **User Input A** is the **Max Loop**, **User Input B** is the **Timer Run/Stop** bit, and **User Input C** is the **timer output mode**.

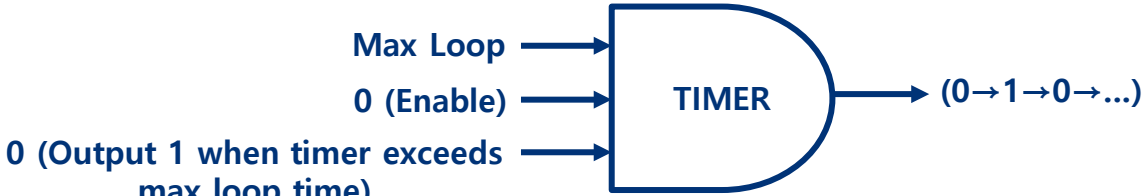
- The **TIMER** starts when **User Input B = 0**.
- If **User Input C = 1**, then 1 is added to the output each time a User Sequence loop is completed. The count will reset when the Max Loop (User Input A) is exceeded.
- If **User Input C = 0**, then 1 is the output when the timer value exceeds the Max Loop. The Max Loop time is multiplied by the User Sequence Loop Time for the total delay time.

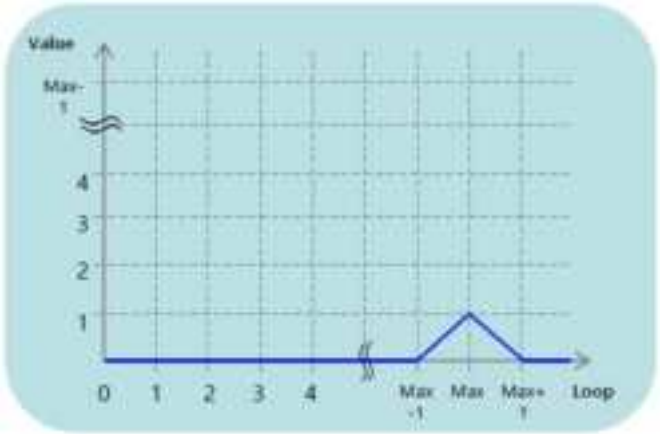


TIMER - Continued





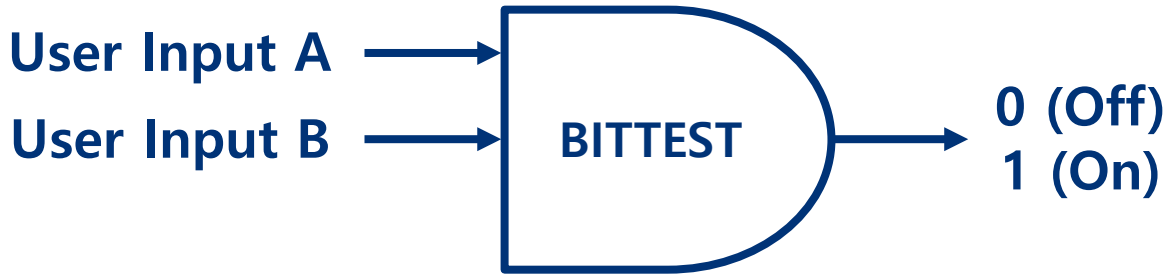




BITTEST (Bit Test)

The **BITTEST** function block follows the rule where if a specific bit (**User Input B**) of an address value (**User Input A**) is "**1**", then the **output** is "**1**". If it is "**0**", then the **output** is "**0**".

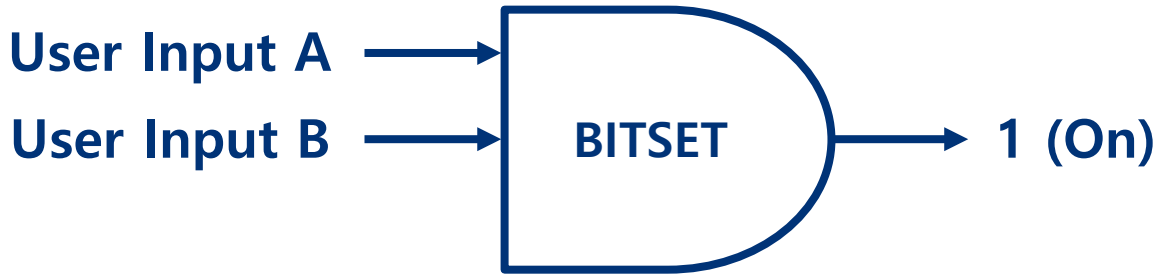
- The input value of User Input B must be between 1-16 starting with bit 1. If the value is higher than 16, it will be recognized as 16. If the input value of User Input B is "0", the output is always "0".



BITSET (Bit Set)

The **BITSET** function block sets the defined bit (**User Input B**) of the input addresses' value (**User Input A**). The output is the changed value.

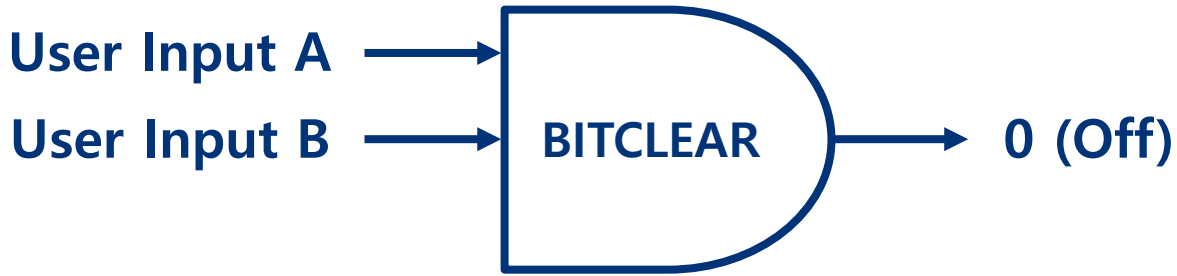
- The input value of User Input B must be between 1-16 starting with bit 1. If the value is higher than 16, it will be recognized as 16. If the input value of User Input B is "0", the output is always "0".



BITCLEAR (Bit Clear)

The **BITCLEAR** function block clears the defined bit (**User Input B**) of the input addresses' value (**User Input A**). The output is the changed.

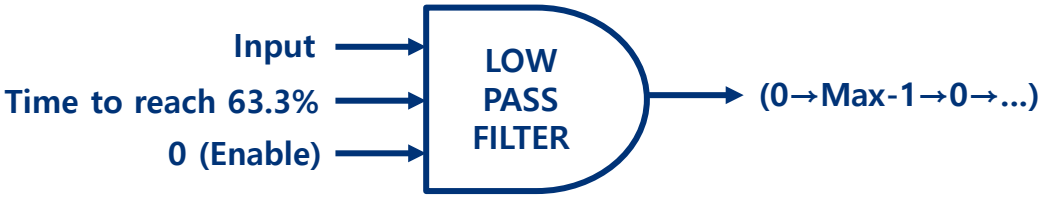
- The input value of User Input B must be between 1-16 starting with bit 1. If the value is higher than 16, it will be recognized as 16. If the input value of User Input B is "0", the output is always "0".

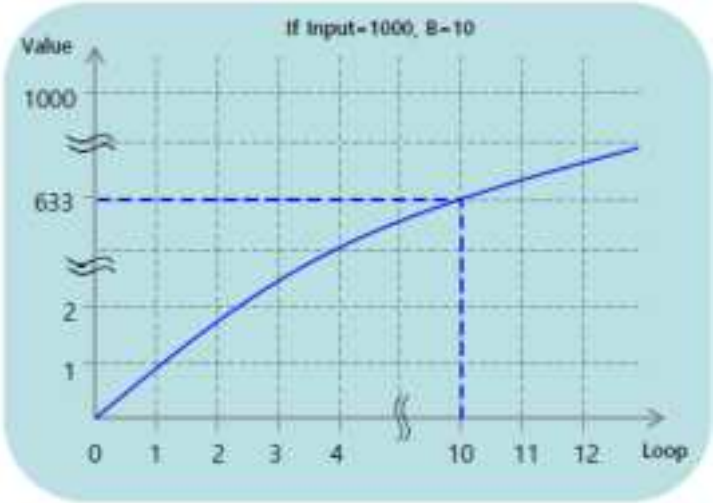


LOWPASSFILTER (Low Pass Filter)

The **LOWPASSFILTER** function block outputs the input at **A** (**User Input A**) using **User Input B** as the filter gains time constant.

- If **User Input C** is "0", the operation is started.





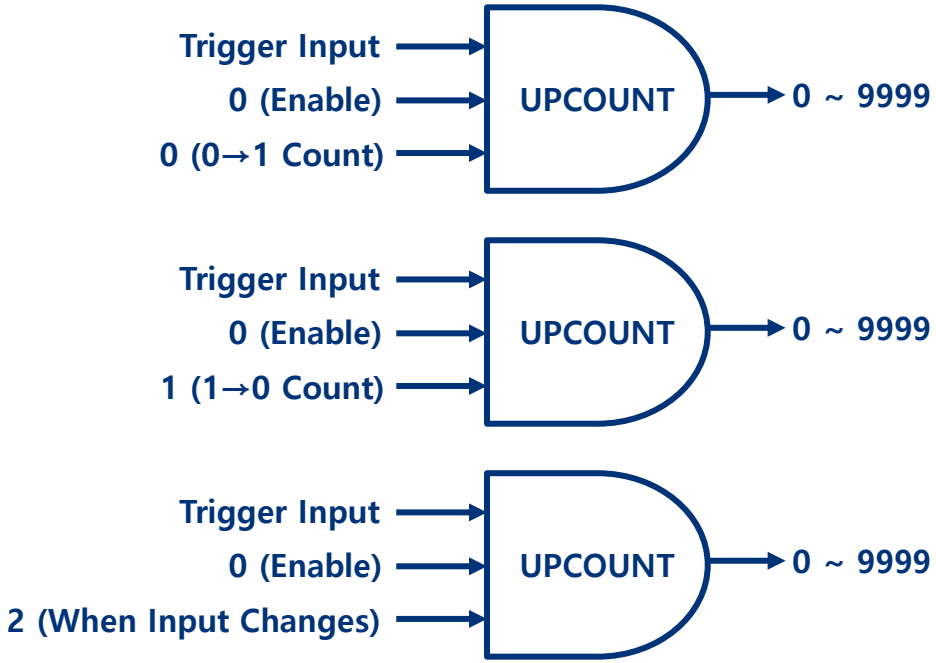
UPCOUNT (Up Count)

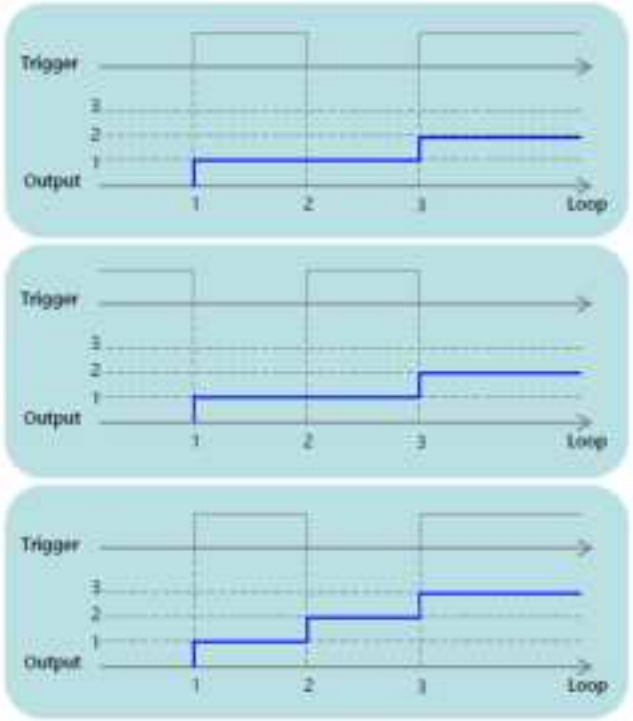
The **UPCOUNT** function block receives a trigger input (A) and outputs are up-counted by C conditions.

- If C is 0, upcount starts when the trigger input (A) changes from 0 to 1 (rising edge).
- If C is 1, upcount starts when the trigger input (A) changes from 1 to 0 (falling edge).
- If C is 2, upcount starts when the trigger input (A) changes.

UPCOUNT - Continued

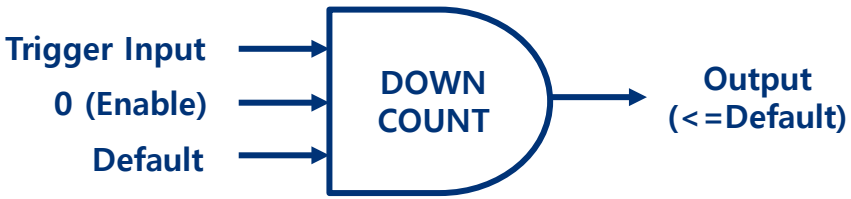
The **UPCOUNT** function block receives a trigger input (A) and outputs are up-counted by C conditions.

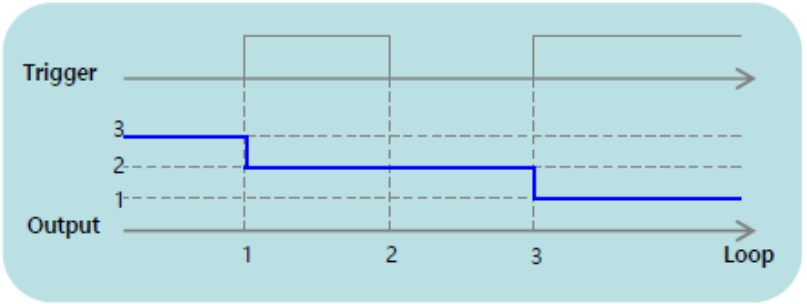




DOWNCOUNT (Down Count)

The **DOWNCOUNT** function block receives a trigger input (A) and outputs a value down-counted by C conditions.

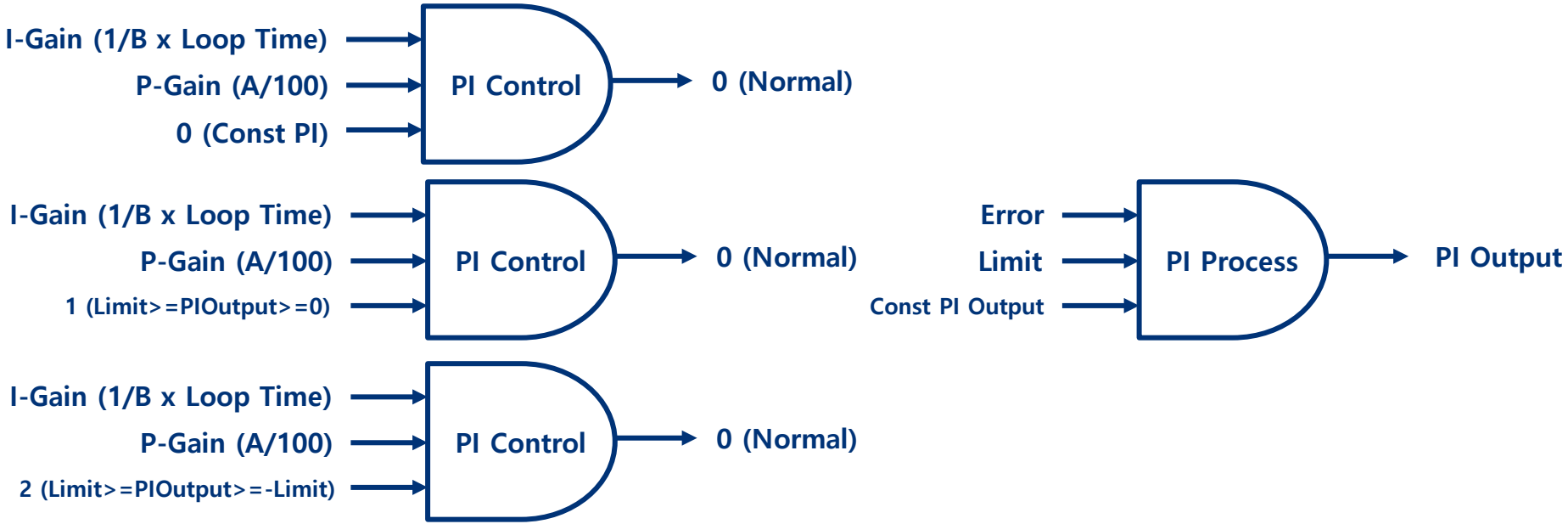




PI CONTROL + PI PROCESS

The **PI CONTROL + PI PROCESS** function blocks can be used for PI control.

- The **PI PROCESS** block must be used after the **PI CONTROL** block.
- The **PI Output** = Error x P-Gain (A/100) + [Loop x {Error x I-Gain (1/B x Loop Time)}].



Example #1

Adding an Analog Signal to the Accel Time

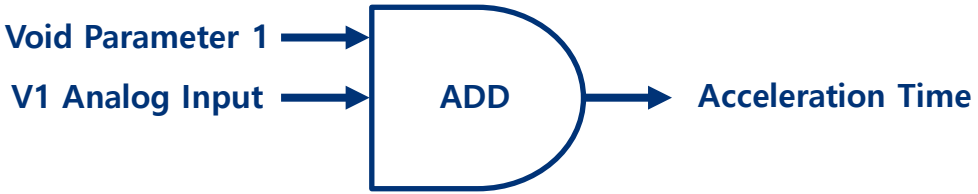
Using the **ADD** function block, the value from V1 analog input along with a pre-set integer value can simply be added together for the acceleration time. Note, V1 Monitor is scaled up to 100.0% or "10.00" and the Acceleration Time requires one decimal place.

Parameter	Description	Value	Note
AP-02	User Sequence Enable	1: Yes	Enables the User Sequence
US-01	User Sequence Command	1: Run	Runs the User Sequence
US-11	Link UserOut1	0007	Links the Output for User Function 1 to the Acceleration Time (0h0007)
US-31 (0h191F)	Void Parameter 1	300	Sets an integer value of 300 to Void Parameter 1
UF-01	User Function 1	1: ADD	Assigns the ADD function block to the User Function 1
UF-02	User Input 1-A	0h191F	Assigns Void Parameter 1 (0h191F) to Input A for User Function 1
UF-03	User Input 1-B	0h0012	Assigns V1 Monitor % (0h0012) to Input B for User Function 1

Example #1

Adding an analog signal to the accel time

With 0VDC on V1, a value of "300" (preset integer value) or 30.0s will be the acceleration time. If 5V is being inputted on V1, a value of "500" or 50.0s in addition to 30.0s (80.0s total) will be the acceleration time.



Example #2

Drive Stops After 20s Using External Trip

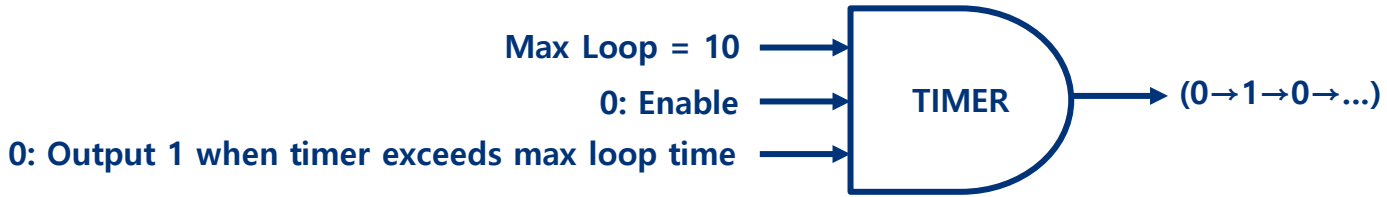
Using the **TIMER** function block and the **Virtual Digital Input** function, an External Trip can be set to occur with an on-delay of 20s when digital input P3 is activated. Note, a digital input on-delay can be set in parameter IN-85 but only up to 10s max.

Parameter	Description	Value	Note
IN-67	P3 Define	50: US Enable	Assigns the User Sequence enable function to digital input P3
CM-70	Virtual DI 1 Define	4: External Trip	Assigns the External Trip function to Virtual DI 1
AP-02	User Sequence Enable	1: Yes	Enables the User Sequence
US-01	User Sequence Command	2: DI Run	Set Digital Input Run as the run signal for the User Sequence
US-02	User Sequence Loop Time	1s	Sets the User Sequence Loop Time to 1s
US-11	Link User Output 1	0x0385	Links the Output for User Function 1 to the Virtual DI read/write (0x0385)
US-31 (0h191F)	Void Parameter 1	20	Sets an integer value of 20 to Void Parameter 1
US-32 (0h1920)	Void Parameter 2	0	Sets an integer value of 0 to Void Parameter 2
US-32 (0h1921)	Void Parameter 3	0	Sets an integer value of 0 to Void Parameter 3
UF-01	User Function 1	14: TIMER	Assigns the TIMER function block to User Function 1
UF-02	User Input 1-A	0h191F	Assigns Void Parameter 1 (0h191F) to Input 1-A
UF-03	User Input 1-B	0h1920	Assigns Void Parameter 2 (0h1920) to Input 1-B
UF-04	User Input 1-C	0h1921	Assigns Void Parameter 3 (0h1921) to Input 1-C

Example #2

Drive Stops After 20s Using External Trip

When digital input P3 is activated (closed), the User Sequence will start in the background. With only the TIMER function block used as function 1, the output will turn to a "1" after 20s (delay time). This is due to a 1s User Sequence Loop Time and 20s max loop for the TIMER function block (1s x 20). The output is then linked to the Virtual DI read/write address where it activates Virtual DI 1 set for External Trip.



Example #3

Switch the Frequency Reference from V0 to V1

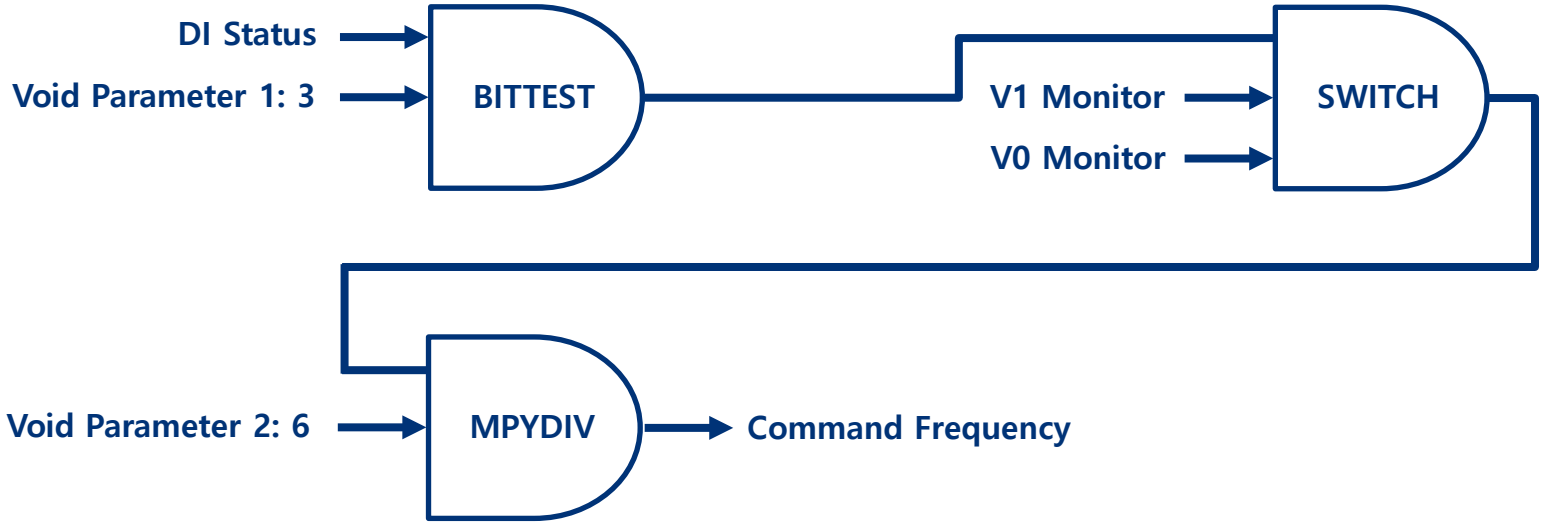
Using both the **SWITCH** and **BITTEST** function blocks, the frequency reference can be switched from V0 to V1 with a digital input. Typically, this can be achieved with Second Source function built in the drive but not if it's already in use. Also, the **MPYDIV** function block had to be used to multiply the output of function 2 by "6" due to scaling.

Parameter	Description	Value	Note
IN-67	P3 Define	0: None	Sets a value of 0: None to digital input P3
AP-02	User Sequence Enable	1: Yes	Enables the User Sequence
US-01	User Sequence Command	1: Run	Runs the User Sequence
US-13	Link User Output 3	0x1D00	Links the Output for User Function 3 to the Command Frequency (0x1D00)
US-31 (0h191F)	Void Parameter 1	3	Sets an integer value of 3 to Void Parameter 1
US-32 (0h1920)	Void Parameter 2	6	Sets an integer value of 6 to Void Parameter 2
UF-01	User Function 1	21: BITTEST	Assigns the BITTEST function block to User Function 1
UF-02	User Input 1-A	0h155A	Assigns the DI Status (0x155A) to Input 1-A
UF-03	User Input 1-B	0h191F	Assigns Void Parameter 1 (0x191F) to Input 1-B
UF-06	User Function 2	20: SWITCH	Assigns the SWITCH function block to User Function 2
UF-07	User Input 2-A	0x1A05	Assigns the Output from User Function 1 (0x1A05) to Input 2-A
UF-08	User Input 2-B	0x0012	Assigns the V1 Monitor (0x0012) to Input 2-B
UF-09	User Input 2-B	0x0013	Assigns the V0 Monitor (0x0013) to Input 2-C
UF-11	User Function 3	8: MPYDIV	Assigns the MPYDIV function block to User Function 3
UF-12	User Input 3-A	0x1A05	Assigns the Output from User Function 2 (0x1A0A) to Input 3-A
UF-13	User Input 3-B	0x0012	Assigns Void Parameter 2 (0x1920) to Input 3B

Example #3

Switch the Frequency Reference from V0 to V1

When digital input P3 is activated (closed), the Frequency Reference will switch from V0 (built-in potentiometer) to V1 (0-10VDC) analog input.



Example #3

Switch the Frequency Reference from V0 to V1