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The contents of this Technical Information are subject to change without notice.

1. Introduction

❖ To the UT750 Users

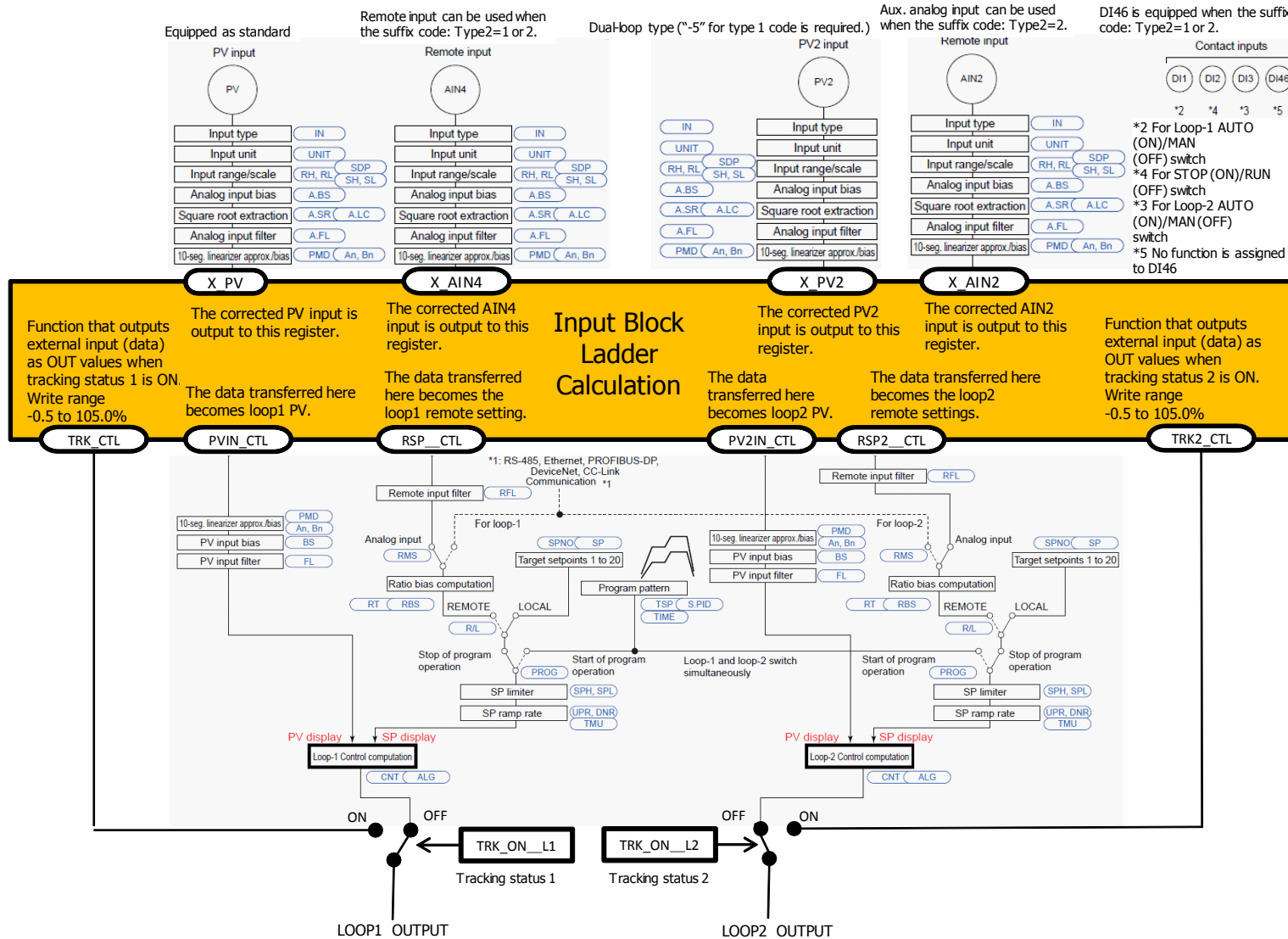
- ❖ The UTAdvanced Series uses ladder programs to achieve the custom computation features of the UT750. UT750 programs need to be reconstructed as UT75A ladder programs.
- ❖ This document describes compatibility issues between UT750 custom computation instructions and UT75A ladder instructions.
- ❖ Refer to this document when you reconstruct your programs.
- ❖ For the operating procedures of the LL50A, see the LL50A User's Manual (IM 05P05A01-02EN).

❖ Differences between the UT75A and UT750

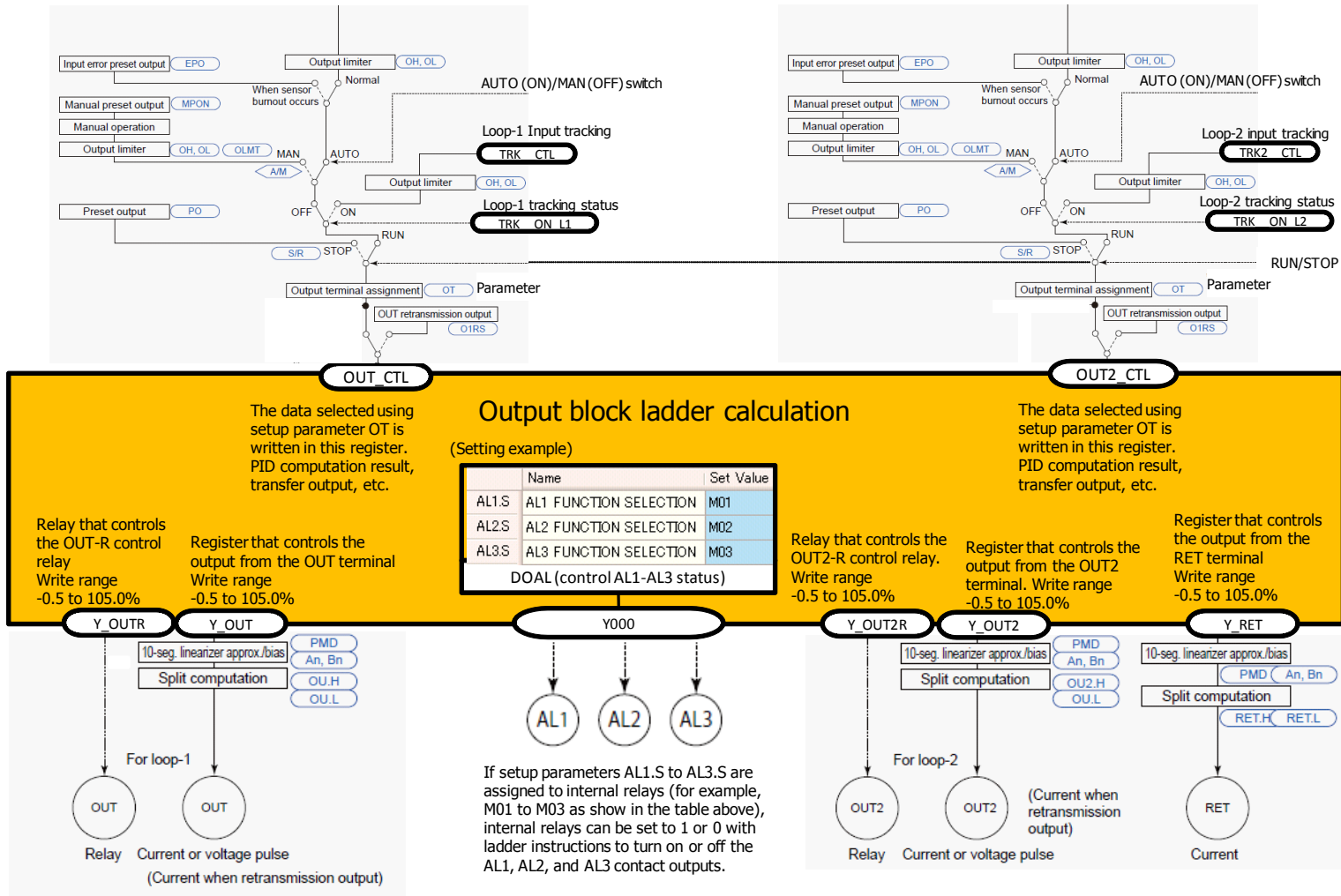
- ❖ UT75A ladder instructions can compute real quantities.
 - In the case of the UT750, custom computation had to be created taking into consideration the internal data 0 to 30000. For this reason, there was an EU range conversion module, but this is not necessary for the UT75A.
- ❖ User parameter names
 - U1 to U8 for the UT750
 - P01 to P30 for the UT75A
- ❖ I relay types
 - The UT750 ON status (I193 to I384) and OFF status (I385 to I576) turn on for one control period when the status changes.
 - The UT75A does not have an I relay that indicates status changes. Use the ladder instruction DIFU and DIFD to generate it.

2. Ladder Program Registers

Primary Ladder Program Registers Used in an Input Function Block



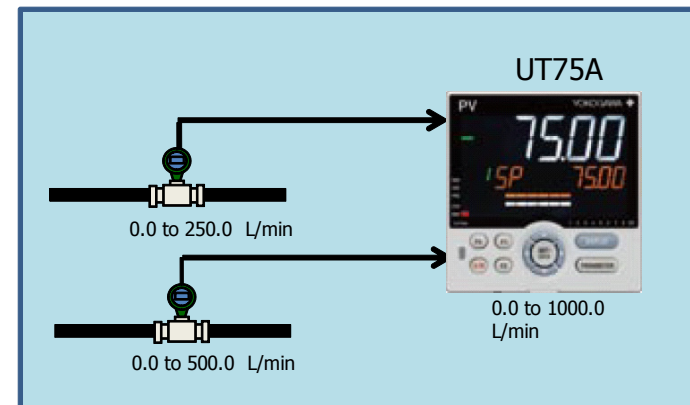
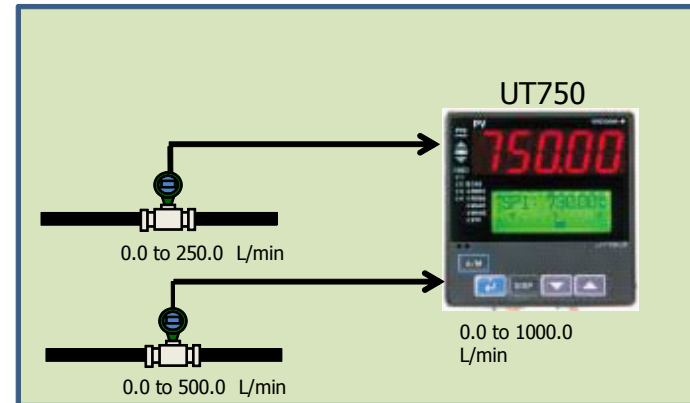
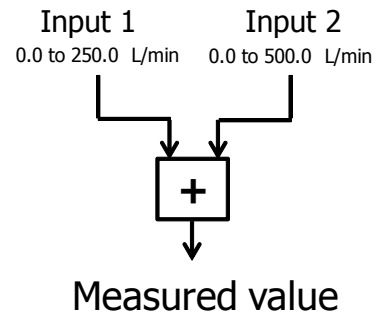
Primary Ladder Program Registers Used in an Output Function Block



3. Examples

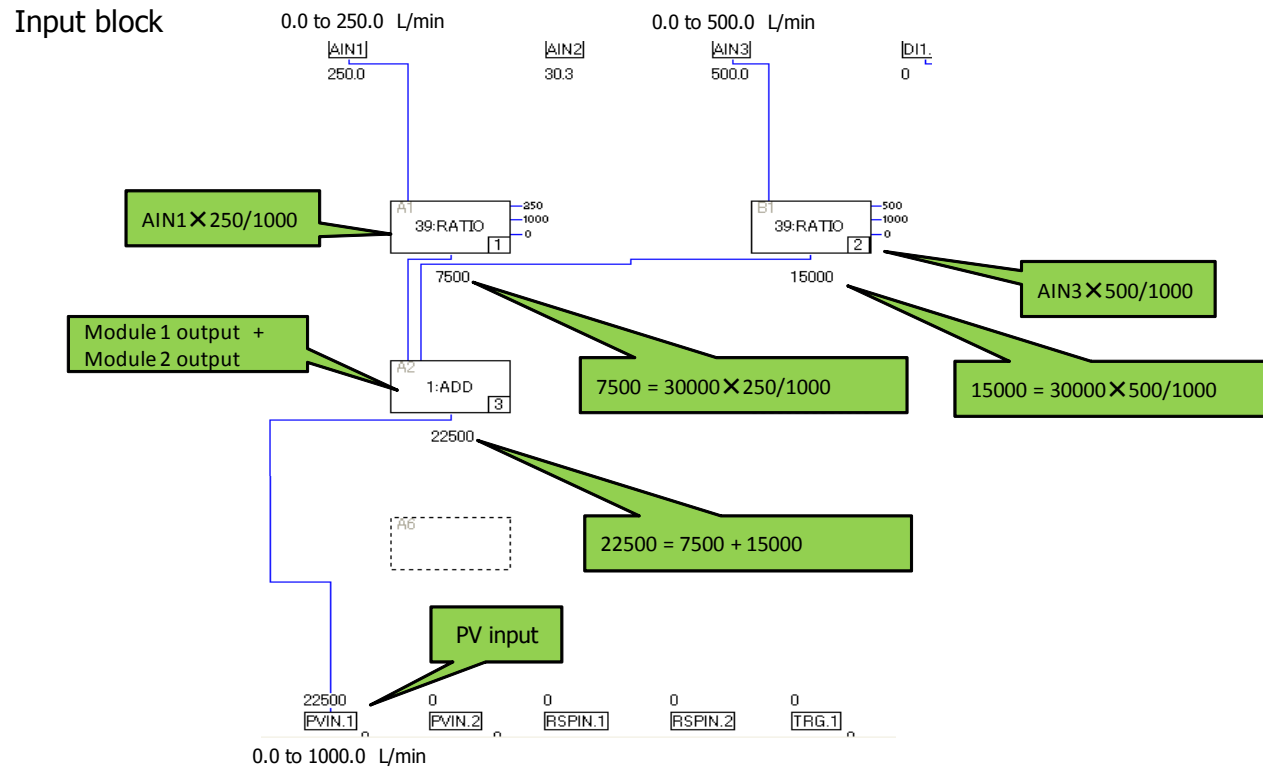
❖ Example of Replacing a UT750 Custom Computation with a UT75A Ladder Program (1/3)

❖ In this example, two flow rates are summed and displayed as a measured value.



❖ Example of Replacing a UT750 Custom Computation with a UT75A Ladder Program (2/3)

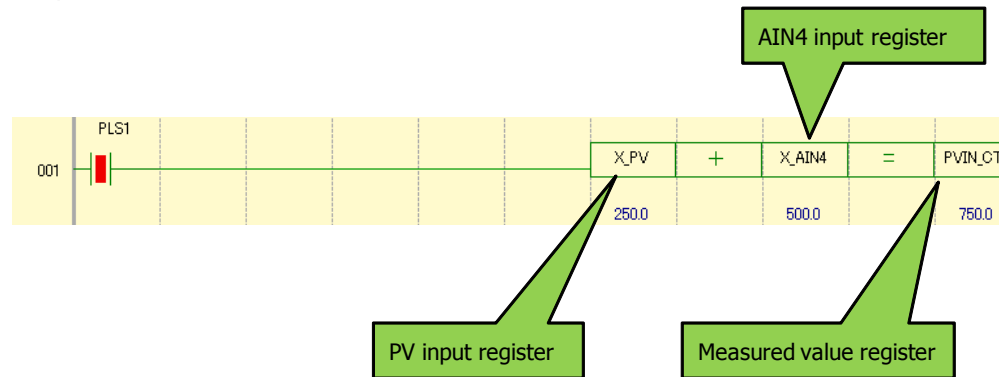
❖ UT750 custom computation



❖ Example of Replacing a UT750 Custom Computation with a UT75A Ladder Program (3/3)

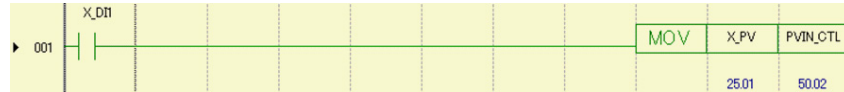
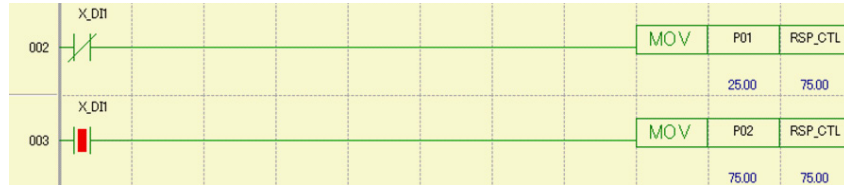
❖ UT75A ladder calculation

Input ladder calculation

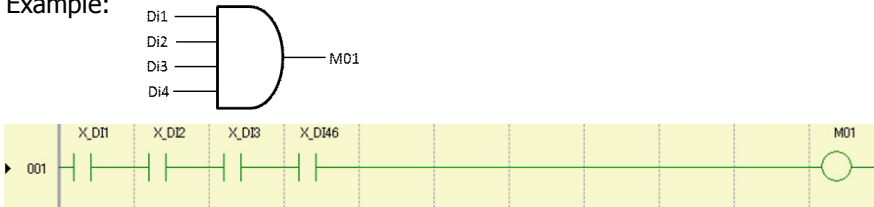
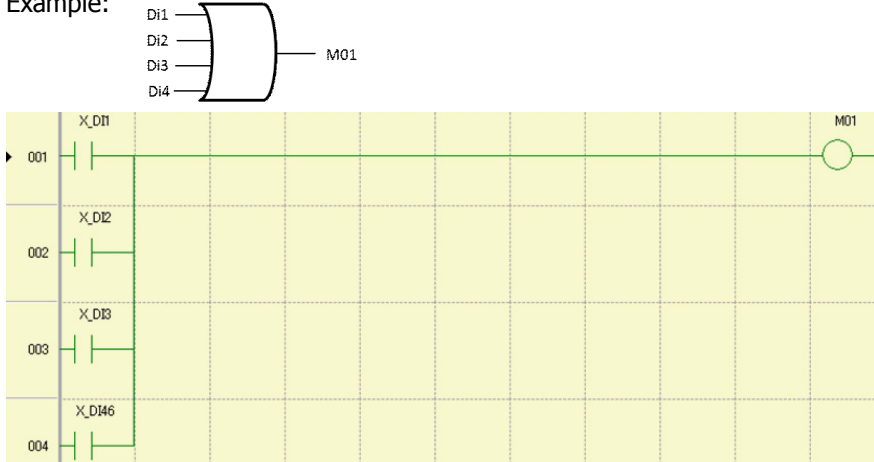


4. Conversion Tables

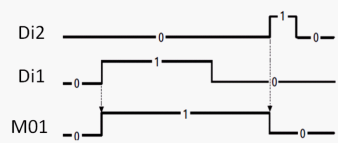
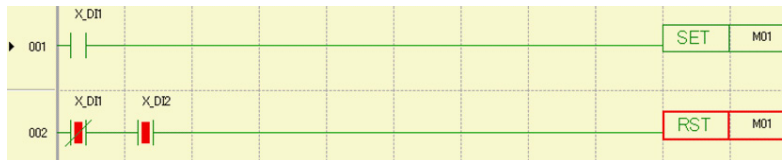
Conversion Table (No. 1 to 11)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
1	ADD	Addition	ADD	
2	SUB	Subtraction	SUB	
3	MUL	Multiplication	MUL	
4	DIV	Division	DIV	
5	ABS	Absolute Value	ABS	
6	RECIPRO	Reciprocal	RECIPRO	
7	MINMAXAVE	Auto Selector	MAX, MIN, AVE, SUB	
8	MAXHOLD	Hold Maximum Value	MXHD1	
9	MINHOLD	Hold Minimum Value	MNHD1	
10	HOLD	Hold	Multiple instructions	<p>Use the Load and Move instructions. Example: Hold measured value with Di1 OFF.</p> 
11	SWITCH	Switch	Multiple instructions	<p>Use the Load and Move instructions or Load Not and Move instructions. Example: Set P01 input to the remote SP value with Di1 OFF. Set P02 input to the remote SP value with Di1 ON.</p> 

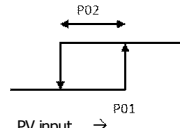
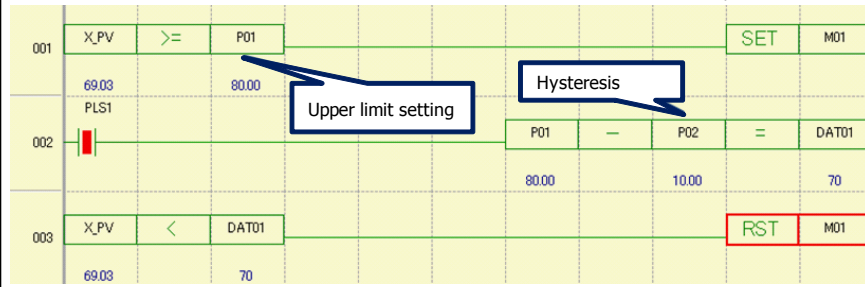
Conversion Table (No. 12 to 15)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
12	LIMIT	Limiter	LIMIT	
13	CONST	Constant	MOV	Set the K parameter to a constant, and substitute the constant in the target parameter.
14	AND	AND Logic	Multiple instructions	<p>Use the Load and And instructions. Example:</p> 
15	OR	OR Logic	Multiple instructions	<p>Use the Load and Or instructions. Example:</p> 

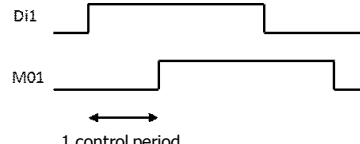
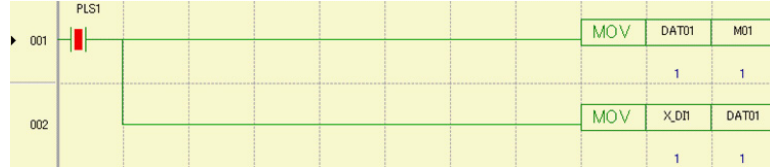
Conversion Table (No. 16 to 18)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
16	XOR	XOR Logic	XOR_B	
17	NOT	NOT Logic	NOT_B	
18	LATCH	Latch	Use the internal (M) relay and multiple instructions.	<p>Use the M relay for the previous and output values. Example:</p>  <p>[Note] When a power failure occurs, OUT is reset to 0.</p> 

❖ Conversion Table (No. 19 to 22)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
19	GT	Greater-than Logic	Use the internal (M) relay and multiple instructions.	<p>Use the M relay for the previous and output values. Use the GEF and LTF instructions to SET and RST.</p> <p>Example M01 is turned on when the PV input is P01 or greater. It is turned off when the PV input is less than (P01-P02).</p>   <p>The diagram shows a ladder logic program with three steps:</p> <ul style="list-style-type: none"> Step 001: X_PV >= P01 (80.00) SET M01. A callout box labeled "Upper limit setting" points to the value 80.00. Step 002: PLS1 (80.00) P01 - P02 = DAT01 (10.00) 70. A callout box labeled "Hysteresis" points to the subtraction operation. Step 003: X_PV < DAT01 RST M01 (70).
20	LT	Less-than Logic	Use the internal (M) relay and multiple instructions.	Use the M relay for the previous and output values. Use the LEF and GTF instructions to SET and RST.
21	DCOUNTER	Decremental Counter	Multiple instructions	<p>The basic function is achieved with CNT.</p> <p>To make the count input both edges, use DIFU and DIFD.</p> <p>For auto initialization, apply count-out relay CNT1 to the reset input in the next period.</p> <p>For the current counter value, query COUNTER1.</p>
22	COUNTER	Counter	Use DAT and multiple instructions.	<p>The basic function is achieved with ADD. Add 1 to DAT.</p> <p>To make the count input both edges, use DIFU and DIFD.</p>

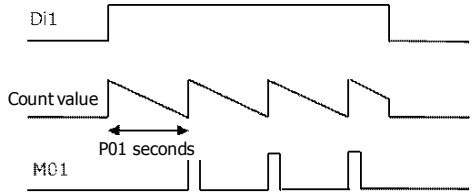
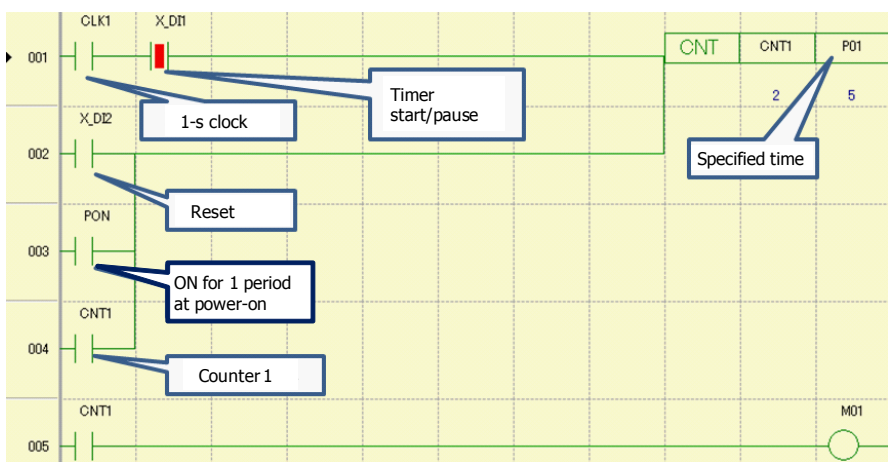
Conversion Table (No. 23 to 29)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
23	EQ	Equal-to Logic	IRNGF	
24	NEQ	Not-Equal-to Logic	ORNGF	
25	RANGE	Range Logic	IRNGF	
26	DELAY	Delay Logic	Multiple instructions	<p>DAT and two MOV instructions Example: Output the Di1 status through M01 with one control period delay.</p>  
27	ANDW	AND (Long Word) Logic	AND	UT750 uses 32 bit. UT75A uses 16 bit.
28	ORW	OR (Long Word) Logic	OR	UT750 uses 32 bit. UT75A uses 16 bit.
29	SHIFT	Word Shift	RSFT LSFT SFT	UT750 is 32bit signed. UT75A is 16bit. RSFT and LSFT are unsigned.

Conversion Table (No. 30 and 31)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
30	SUM	Sum	Use DAT and multiple instructions.	<p>UT750 P1 initialization flag: MOV the initial value (UT750 IN2) to DAT. DAT = DAT + sum value (UT750 IN1) UT750 is 32 bit integer. UT75A is 32 bit floating-point number.</p>
31	TIMER	Timer	Multiple instructions	<p>The basic function is achieved with CNT. Use the special relay clock. For the initial value, use the K or P register. For auto initialization, take the Load Not of the timeout relay TIM1 in the next period. Example: When the auto initialization flag is OFF</p>

Conversion Table (No. 31 Continued)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
31	TIMER	Timer	Multiple instructions	<p>(continued from the previous page) Example: When the auto initialization flag is ON</p>  

Conversion Table (No. 32 to 41)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
32	CHGLMT	Rate-of-change Limiter	CLMT	
33	PLINE1	10-segment Linearizer 1	PLN1	10-segment linearizer is PLN1. Biasing is not possible. Use a 10-segment linearizer table that takes bias into consideration.
34	PLINE2	10-segment Linearizer 2	PLN2	10-segment linearizer is PLN2. Biasing is not possible. Use a 10-segment linearizer table that takes bias into consideration.
35	ILINE1	Inverse 10-segment Linearizer 1	ILN1	
36	ILINE2	Inverse 10-segment Linearizer 2	ILN2	
37	CURVE1	Curve Linearizer 1	PLN21	UT750 uses curve linearizer. UT75A uses a 20-segment linearizer.
38	CURVE2	Curve Linearizer 2	PLN22	UT750 uses curve linearizer. UT75A uses a 20-segment linearizer.
39	RATIO	Ratio	RATIO	
40	FILTER	First Order Lag Filter	FLTR	
41	EUCONV	EU Range Conversion	No corresponding instruction	The UT75A does not use internal data (0 to 30000), so there is no need for EU range conversion.

Conversion Table (No. 42 to 54)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
42	SELECT2	Switching Between 2 Inputs	No corresponding instruction	For the UT75A, set the control mode to loop control with PV switching.
43	TMPHUM	Temperature and Humidity Calculation	TMPHUM	
44	SQR	Square Root Extraction	SQT	
45	CHGDET	Detection of Change	DIFU, DIFD	
46	OUTSEL1	Loop 1 Output Selection 1	No corresponding instruction	Use the output type selection parameter (OT) to set it.
47	OUTSEL11	Loop 1 Output Selection 11	No corresponding instruction	Use the output type selection parameter (OT) to set it.
48	OUTSEL12	Loop 1 Output Selection 12	No corresponding instruction	Use the output type selection parameter (OT) to set it.
49	OUTSEL13	Loop 1 Output Selection 13	No corresponding instruction	Use the output type selection parameter (OT) to set it.
50	OUTSEL14	Loop 1 Output Selection 14	No corresponding instruction	Use the output type selection parameter (OT) to set it.
51	OUTSEL2	Loop 2 Output Selection 2	No corresponding instruction	Use the output type selection parameter (OT) to set it.
52	OUTSEL21	Loop 2 Output Selection 21	No corresponding instruction	Use the output type selection parameter (OT) to set it.
53	OUTSEL22	Loop 2 Output Selection 22	No corresponding instruction	Use the output type selection parameter (OT) to set it.
54	OUTSEL23	Loop 2 Output Selection 23	No corresponding instruction	Use the output type selection parameter (OT) to set it.

Conversion Table (No. 55 to 66)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
55	DISPCHG	Display Data Unit Conversion	No corresponding instruction	The UT75A does not use internal data (0 to 30000), so there is no need for display data unit conversion.
56	PARASET	Parameter Setting	MOV	Specify the parameter as the destination of the MOV instruction.
57	DISP1	Data Display 1	No corresponding instruction	Use the UT75A's custom display function.
58	DISP2	Data Display 2	No corresponding instruction	Use the UT75A's custom display function.
59	EXRDO	Special DO Output	No corresponding instruction	
60	OUTSET1	Output 1 Terminal Configuration	No corresponding instruction	Use the output type selection parameter (OT) to set it.
61	OUTSET2	Output 2 Terminal Configuration	No corresponding instruction	Use the output type selection parameter (OT) to set it.
62	TCOMP	Fluid Temperature Compensation	TCMP1	
63	PCOMP	Fluid Pressure Compensation	PCMP1	
64	PLINE3	10-segment Linearizer 3	PLN3	
65	PLINE4	10-segment Linearizer 4	PLN4	
66	(None)	-	-	-

Conversion Table (No. 67 to 78)

UT750 custom computation			UT75A ladder program	
No	Symbol	Module name	Corresponding instruction	Description
67	DED	Dead Time	DED	
68	MAV	Moving Average	MAV	
69	MSELECT	Multi-selector	Multiple instructions	IRNGF, RATIO
70	ECOUNTER	Edge-triggered Counter	Multiple instructions	The basic function is achieved with ADD/SUB. To make the count input both edges, use DIFU and DIFD.
71	ETIMER	Edge-triggered Timer	Multiple instructions	The basic function is achieved with TIM. Use the special relay clock.
72	ECHGDET	Detection of Change at Edge	DIFU, DIFD	
73	SQR2	Square Root Extraction 2	SQTE	
74	FLWSUM	Flow Sum	No corresponding instruction	
75	CPO	Integrated Pulse Output	CPO	
76	BCD	BCD Conversion	BCD	
77	XORW	XOR (Long Word) Logic	XOR	UT750 uses 32 bit. UT75A uses 16 bit.
78	DATASAVE	Data Save	No corresponding instruction	MOV to the P register.

Revision Information

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