MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

Analog timer module type A1ST60 (Hardware)

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers Please read this manual carefully so that the equipment is used to its optimum A copy of this manual should be forwarded to the end User

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IB (NA) 66479 A (9404) MEE Printed in Japan

1. GENERAL DESCRIPTION

1 GENERAL DESCRIPTION

This User's Manual explains the specifications, handling, and how to use the A1ST60 type analog timer module (hereafter called the A1ST60) used with an AnSCPU

An A1ST60 can set and adjust timer time easily without using a programming

1 1 Features

(1) An A1ST60 has 8 points of analog timers (T0 to T7)

(2) Range of an analog timer can be set individually

- 0 1 to 1 0 sec
- 1 to 10 sec
- 10 to 60 sec
- 60 to 600 sec

(3) Timer time can be adjusted by potentiometers

(4) An A1ST60 has a pause function that can temporarily stops counting of a timer

POINTS

(1) The analog timer (T0 to T7) of the A1ST60 is different from CPU's internal timer (T0 to T7)
An analog timer (T0 to T7) on a sequence program programs an I/O signal X allocated to A1ST60 as a contact of an analog timer and programs Y as a coil

(2) I/O numbers X and Y designated in this manual are based on the case that an A1ST60 is installed at slot 0 of a main base unit

2. SPECIFICATIONS

2 SPECIFICATIONS

2 1 General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55 °C (See the important notice described below)				
Storage ambient temperature	--20 to 75 °C				
Operating ambient humidity	10 to 90% RH, non-condensing				
Storage ambient humidity	10 to 90% RH, non-condensing				
Vibration resistance	Conforms to *2 JIS C 0911	Frequency	Acceleration	Amplitude	Sweep Count
		10 to 55 Hz	—	0 075 mm (0 003 in)	10 times *1 (1 octave/ minute)
		55 to 150 Hz	9 8 m/s^2 (1g)	—	
Shock resistance	Conforms to *2 JIS C 0912 (98 m/s^2 (10g) x 3 times in 3 directions)				
Noise durability	By noise simulator of 1500 Vpp voltage 1 μsec noise width and 25 to 60 Hz noise frequency				
Dielectric withstand voltage	1500 VAC for 1 minute across AC external terminals and ground 500 VAC for 1 minute across DC external terminals and ground				
Insulation resistance	5 MΩ or greater by 500 VDC insulation resistance tester across AC external terminals and ground				
Grounding	Class 3 grounding; Ground to the panel if proper grounding is not available				
Operating ambience	Free of corrosive gases Dust should be minimal				
Cooling method	Self-cooling				

REMARKS

(1) One octave marked *1 indicates a change from the initial frequency to double or half frequency For example, any of the changes from 10 to 20 Hz, from 20 to 40 Hz, or 20 to 10 Hz are referred to as one octave

(2) *2JIS: Japanese Industrial Standard

IMPORTANT

Restriction for UL standard approved products

In order to be recognized as UL listed products, the following restructions apply;

(1) Operating ambient temperature is limited from 0 to 50°C

(2) A class 2 power supply recognized by the UL standard must be used

2 2 Performance Specifications

Items	Specifications
Number of timers	8 points (ON delay operation)
Timer set value range (Can be selected individually)	0 1 to 1 0 sec 1 to 10 sec 10 to 60 sec , 60 to 600 sec
Timer precision	±2 0 %
Number of occupied I/O points	16 (I/O allocation output 16 points)
Internal current consumption (5 VDC)	0 055 A
Weight kg (lb)	0 13 (0 29)

2 3 Applicable Systems

(1) An A1ST60 applies to an AnSCPU

(2) Number of A1ST60 modules is not limited

Number	Contents
(1)	Timer operating LED Displays the ON/OFF state of an analog timer (T0 to T7) ON: Lit, OFF: Not lit

LED	Analog Timer	LED	Analog Timer
Y0	T0	Y4	T4
Y1	T1	Y5	T5
Y2	T2	Y6	T6
Y3	T3	Y7	T7

(2) Timer contact LED
Displays the ON/OFF state of an analog timer contact (T0 to T7)
ON: Lit, OFF: Not lit

LED	Analog Timer	LED	Analog Timer
X0	T0	X4	T4
X1	T1	X5	T5
X2	T2	X6	T6
X3	T3	X7	T7

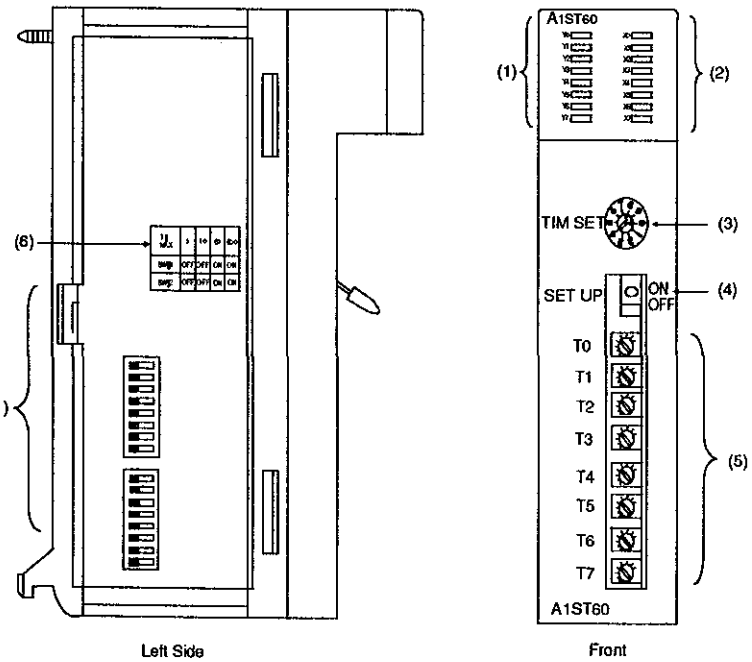
(3) Timer select switch
Selects the analog timer (T0 to T7) to adjust the timer time
(Factory-set to 9)

Number	Contents	Number	Contents
0	Select T0	5	Select T5
1	Select T1	6	Select T6
2	Select T2	7	Select T7
3	Select T3	8	Select T0 to T7
4	Select T4	9	No processing (The switch is usually set to this position)

(4) SET UP Switch
Checks the timer time of an analog timer
(Factory set to OFF)
ON : An analog timer designated in (3) is turned ON
OFF: The switch is usually set to this position

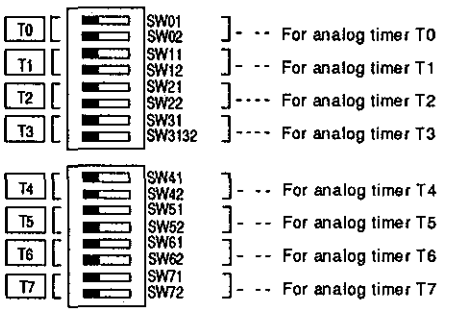
3. NOMENCLATURE

NOMENCLATURE



Left Side Front

Number	Contents
(5)	Adjustment Volume Adjusts time of an analog timer (Factory-set to the minimum value)
(6)	Range switch instruction Shows switch positions to set timer range
(7)	Setting Range Switch



4. SETTING AND OPERATING PROCEDURES

4 SETTING AND OPERATING PROCEDURES

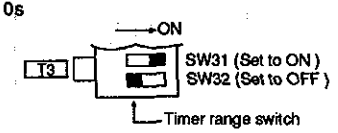
(1) Timer range setting

Set range of analog timers (T0 to T7) by the timer range switch

Switch Names \ Timer Time Ranges	0.1 to 1 s	1 to 10 s	10 to 60 s	60 to 600 s
SW[ ]1	OFF	ON	OFF	ON
SW[ ]2	OFF	OFF	ON	ON

[ ]: Analog timer number (0 to 7)

Example To set the range of an analog timer T3 at 1 to 10s



(2) Install the A1ST60 on a base unit

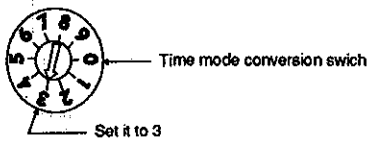
(3) Tuning the adjustment volume

(a) Set the A1SCPU and A1ST60 to the following states and turn ON the power supply to the A1SCPU

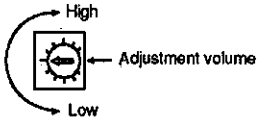
- Set the RUN keyswitch of the A1SCPU to STOP.
- Set the SET UP switch of the A1ST60 to OFF

(b) Select an analog timer (T0 to T7) for adjustment by the timer select switch

Example: Selecting analog timer T3



(c) Adjust the volume of the selected timer for targeted time



(d) Turn ON the SET UP switch

Then, confirm timing between the timer contact LED is lit and the timer operation LED goes ON

(e) Turn OFF the SET UP switch after confirming the ON timing of the timer contact LED

(f) For fine adjustment, repeat the operations in c) to d)

(g) Set time of rest of analog timers in the order given in b) to f)

The coils of all analog timers (T0 to T7) can be turned ON at same time by setting the timer select switch to 8 and turning ON the SET UP switch

(h) After adjusting timers, set the timer select switch to 9

After that, the SET UP switch operation becomes invalid

POINT

If an analog timer is adjusted when the AnSCPU is in the RUN state, the timer starts when either analog timer start signal (Y) or the SET UP switch goes ON

5. PROGRAMMING

5 PROGRAMMING

5.1 I/O Signals List

The following I/O signals are used for the input/output of an analog timer of an A1ST60

Device No	Signal Contents	Device No	Signal Contents
X0	Contact of analog timer T0	Y0	Coil of analog timer T0
X1	Contact of analog timer T1	Y1	Coil of analog timer T1
X2	Contact of analog timer T2	Y2	Coil of analog timer T2
X3	Contact of analog timer T3	Y3	Coil of analog timer T3
X4	Contact of analog timer T4	Y4	Coil of analog timer T4
X5	Contact of analog timer T5	Y5	Coil of analog timer T5
X6	Contact of analog timer T6	Y6	Coil of analog timer T6
X7	Contact of analog timer T7	Y7	Coil of analog timer T7
X8 to XF	(Unusable)	Y8	Pause coil of analog timer T0
		Y9	Pause coil of analog timer T1
		YA	Pause coil of analog timer T2
		YB	Pause coil of analog timer T3
		YC	Pause coil of analog timer T4
		YD	Pause coil of analog timer T5
		YE	Pause coil of analog timer T6
		YF	Pause coil of analog timer T7

5.2 Programming Methods

Use an analog timer as follows:

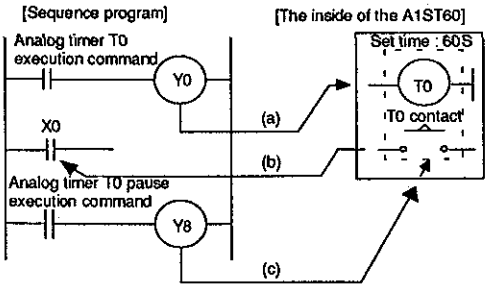
(1) Use Y0 to Y7 as the coil of an analog timer

Use X0 to X7 of the same I/O number as the timer contact

(2) The A1ST60 has a pause coil that temporarily stops an analog timer

Use Y8 to YF as a pause coil

Example: When analog timer T0 is executed with a sequence program



(a) If output Y0 goes ON, analog timer T0 goes ON, and a timer count is started

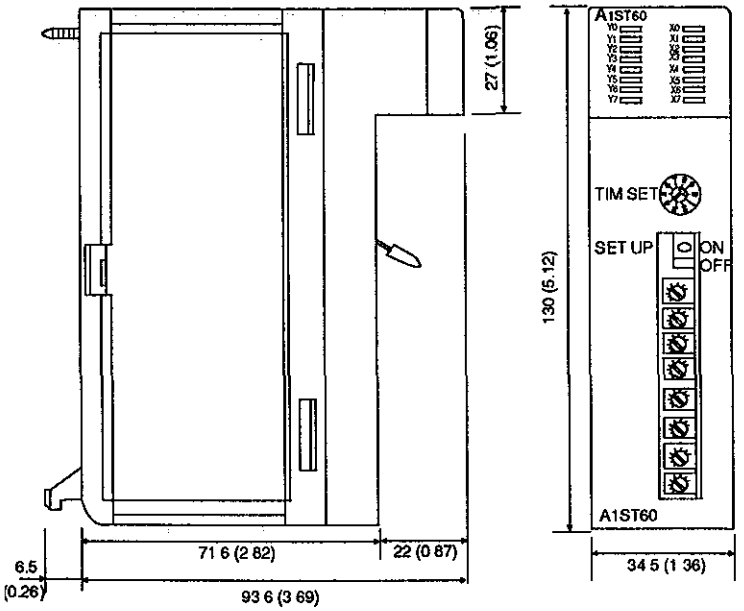
(b) Analog timer contact T0 goes ON and input X0 goes ON 60 seconds after output Y0 goes ON

(c) While output Y8 goes ON, the timer T0 stops

Then, when output Y8 goes OFF, the count is resumed from the time stopped

6. OUTSIDE DIMENSIONS

6 OUTSIDE DIMENSIONS



Unit mm (inch)

REVISIONS

A	
Apr., 1994	

IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety interlocking circuit for the CPs

(2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly If it is necessary to handle them take the following precautions

(a) Ground human body and work bench

(b) Do not touch the conductive areas of the printed circuit board and its electrical parts with and non-grounded tools etc