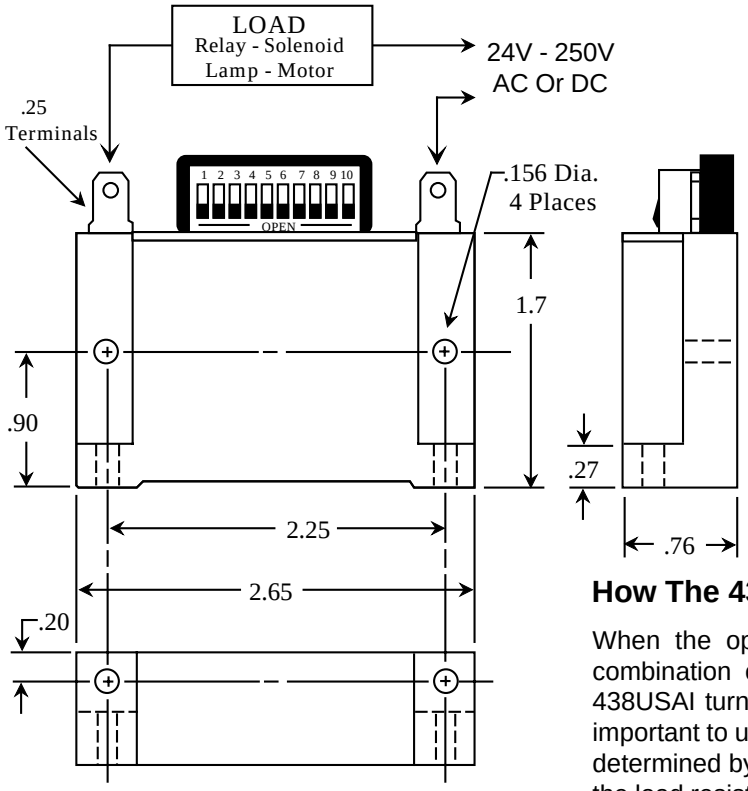
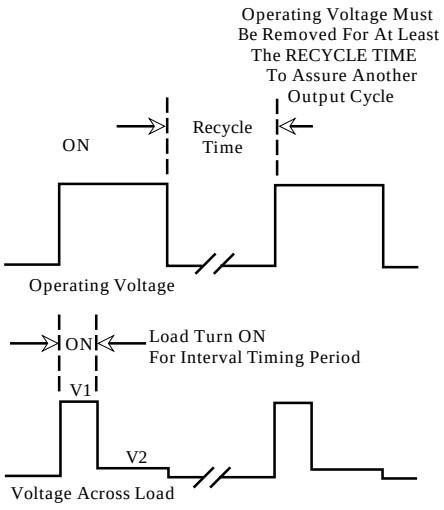
438USAI Universal Switch Adjustable Interval Time Capsule ®

The Model 438USAI is an in-line timing device that performs as a two terminal interval timer. Operation is exactly the reverse of the standard Artisan Controls Corporation Time Capsule ® devices. When connected in series with a load circuit, the 438USAI will energize the load when operating voltage is first applied, turning off after the DIP switch settable delay period. Three models provide interval timing periods of: 0.1 - 102.4 seconds in 0.1 second increments, 1 - 1024 seconds in 1 second increments, and 10 - 10,240 seconds in 10 second increments. The interval timing action can be repeated by removing and re-applying the operating voltage. The 438USAI operates at any voltage from 24 to 250 volts AC or DC.

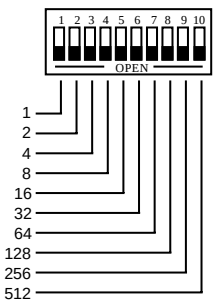
Mechanical . . . . . Timing Diagram . . . . .





How The DIP Switches Work . . . . . .

Switch #1 will add 1 second to the timing period when open. Switch #2 will add 2 seconds to the timing period when open. Switch #3 will add 4 seconds to the timing period when open. Switch #4 will add 8 seconds to the timing period when open. This binary progression permits delay periods ranging from 1 second to 1024 seconds in 1 second increments.



Switches show timing interval of the 438USAI set for 1024 seconds

How The 438USAI Works . . . . . .

When the operating voltage is applied to the series combination of the 438USAI and the load circuit, the 438USAI turns ON, and the load will be energized. It is important to understand that the load current that flows is determined by the (Applied Voltage - 10 volts) divided by the load resistance. The 10 volts is the maximum voltage that will be dropped across the 438USAI at a full .25A of load current. As an example: a 440Ω (ohm) relay coil that would normally draw 250mA at 110V DC will now only be permitted to draw 227mA. This is determined by the voltage across the relay which becomes 110 - 10, or 100V DC (V1). At 100V, the current becomes 100V/440Ω = 227mA. At the end of the timing interval the 438USAI turns OFF, but leakage current continues to flow. This leakage current can be as high as 3mA. This would cause the relay to have 3mA x 440Ω = 1.32V (V2) across it. Always make certain that the dropout voltage of the load circuit is below the voltage caused by the residual leakage current.

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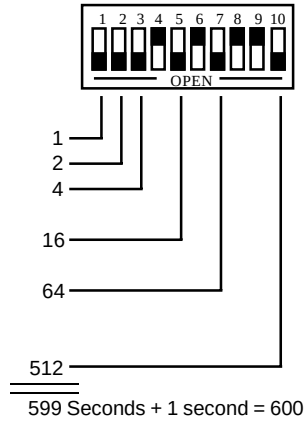
Solid State Timers and Controllers

Specifications

Operating Voltage:	24V - 250V AC/DC 50/60Hz.
Timing Mode:	Interval - Load turns ON with application of operating voltage then turns OFF after delay period.
Timing Ranges:	Three models see *Ordering Information*.
Timing Adjustment:	Digital timing is DIP switch programmable see *Ordering Information*.
Programmable Timing Tolerance:	±15%.
Timing Variation:	±2% at any combination of operating voltage and temperature.
Repeatability Of Timing Period:	±2% nominal.
Recycle Time:	200 milliseconds.
Output Rating:	.25 ampere inductive with inrush current to 8 amperes for 8 milliseconds.
Output Voltage Drop in "ON" State:	10 volts maximum voltage drop across the 438USAI at any operating voltage and load current to .25 ampere during an interval timing cycle.
Leakage Current in "OFF" State:	3 milliamperes maximum at any operating voltage and load circuit.
Transient Protection:	Maximum transient voltage protection is 6000 volts as delivered through a source resistance of 30 ohms with a maximum duration of 8.3 milliseconds.
Operating Temperature:	-20˚C to +85˚C
Humidity:	95% condensing
Terminations:	Two (2) .25 Faston type.
Data Sheet Revision Date:	September 28, 1995

Example Of Setting The 438USAI DIP Switches For An Interval Delay Of 600 seconds

To illustrate the setting of the DIP switches, assume that a 600 second delay period is to be programmed by the 10 DIP switches. In order to achieve the 600 seconds we must add an additional 599 seconds to the initial minimum delay of 1 second. Begin with all DIP switches closed. Now open switch #10 and subtract its value of 512 seconds from the 599, the result is 87. Move down to the next lower DIP switch and repeat the process. However, switch #9 (256 seconds) is greater than the 87 seconds, so return switch #9 to the closed position and move down to the next lower switch #8. Switch #8 (128 seconds) is still greater than the 87 seconds, so return switch #8 to the closed position and move down to the next lower switch #7. Switch #7 (64 seconds) is now subtracted from the 87 resulting in 23 seconds remaining. Leave switch #7 in the open position and move down to switch #6. Switch #6 (32 seconds) is again greater than the 23 seconds, so return switch #6 to the closed position and move down to the next lower switch #5. Switch #5 (16 seconds) is now subtracted from the 23 resulting in 7 seconds remaining. Leave switch #5 in the open position and move down to switch #4. Switch #4 (8 seconds) is again greater than the 7 seconds, so return switch #4 to the closed position and move down to the next lower switch #3. Continue this procedure with switches #3, #2, and #1, which will all be moved to the open position. This technique will work for any time from 1 to 1024 seconds.



Ordering Information

Part Number	Interval Timing Range	Timing Adjustment Increment
438USAI	1 - 1024 Seconds	1 Second
438USAI-1	0.1 - 102.4 Seconds	0.1 Second
438USAI-2	10 - 10,240 Seconds	10 Second

All models operate over the voltage range of 24 to 250 volts AC or DC

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