Made in USA

ICM 500 Series

Digital Timer – TUDR Model

Multi-mode, programmable time delay

Installation, Operation & Application Guide

For more information on our complete range of American-made products – plus wiring diagrams, troubleshooting tips and more, visit us at **www.icmcontrols.com**

ICM CONTROLS™

Table of Contents

Specifications

Time Delay
- **Type:** Switch Settable
- **Range:** 1-1,023 seconds or minutes (Multiples of 0.1, 1, 10, 100)
- **Repeat Accuracy:** ± 2% under fixed conditions
- **Fixed Time Tolerance:** ± 5%
- **Time delay vs. temperature and voltage:**
  - ± 5% Maximum over the specified range of input voltage and temperature

Reset Time
- **During and after timing:**
  - 75 milliseconds (May be reset during the timing period without false output)

Input
- **Nominal Voltage:** 24, 115, 230 VAC or 12, 24, 110 VDC
- **Tolerance:** ± 15% of nominal
- **Frequency:** 50-60 Hz
- **Maximum allowable DC ripple voltage:** 20% peak to peak
- **Power Consumption:** *During:* 0.5 watts maximum *After:* 2.0 watts maximum

Output
- **Type:** Relay
- **Form:** SPDT, DPDT
- **Rating:** 10 amps resistive at 230 VAC;   - 1/6 HP @ 115 VAC
                                                - 1/3 HP @ 230 VAC
- **Life:** *Mechanical:* 10,000,000 *Full Load:* 1,000,000 operations

Protection
- **Transient:** ±1,400 volts for 100 microseconds
- **Polarity:** DC units are inverse voltage protected
- **Dielectric Breakdown:** 1,500 volts RMS minimum at 60 Hz between input and output
                            terminals
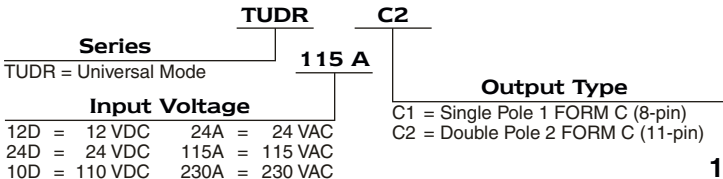- **Insulation Resistance:** 100 megohms minimum

Mechanical Specifications
- **Mounting:** Plug-in
- **Termination:** Standard 8 pin (octal) or 11-pin plug-in
- **Weight:** 5 ounces (142 grams)

Environmental Specifications
- **Operating temperature:** -40°F to +185°F (-40°C to +85°C)
- **Storage temperature:** -40°F to +185°F (-40°C to +85°C)

Product Identification

TUDR   **C2**

Series   **115 A**

TUDR = Universal Mode

Input Voltage

12D	=	12 VDC	24A = 24 VAC
24D	=	24 VDC	115A = 115 VAC
10D	=	110 VDC	230A = 230 VAC

Output Type

C1 = Single Pole 1 FORM C (8-pin)
C2 = Double Pole 2 FORM C (11-pin)

1

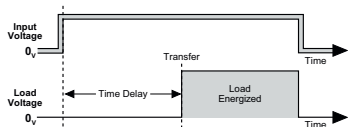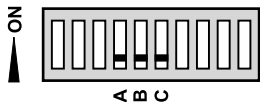# Delay on Make

When power is applied to the input, the time delay begins. After the time delay is complete, the contacts transfer and remain transferred as long as power is applied. The control is reset by removing power during or after the time delay period.
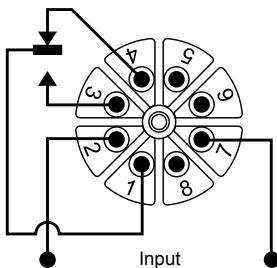
TIMING DIAGRAM

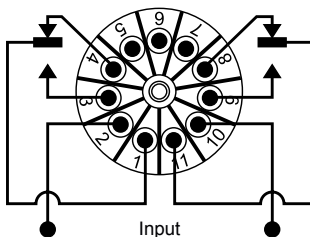## Mode Switch

(See programming instructions on Page 8)

CONNECTION DIAGRAMS

**Single Pole Output
1 FORM C**

Input

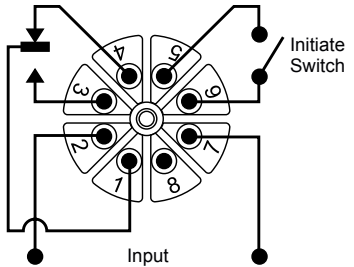**Double Pole Output
2 FORM C**

Input
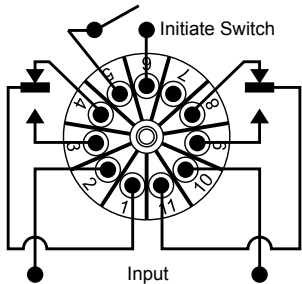
2

Delay on Break

MODE OF OPERATION

Power must be applied before and during the time delay period. When the initiate contact closes, the contacts transfer and remain transferred as long as the initiate contact is closed. The time delay begins when the initiate contact opens. At the end of the time delay period, the contacts are returned to the off state. If the initiate contact recloses during the time delay period, the contacts remain transferred and the time delay is reset to zero. Removal of input power during the delay returns the contacts to the off state and resets the time delay to zero. A one second interrogation delay prevents nuisance trips due to initiate switch bounce or tampering.
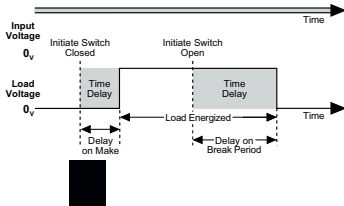
CONNECTION DIAGRAMS

Single Pole Output
1 FORM C

Initiate Switch

Input

Double Pole Output
2 FORM C

Initiate Switch

Input

TIMING DIAGRAM

Time

Input Voltage
0_V

Initiate Switch Closed

Initiate Switch Open

Load Voltage
0_V

Time Delay

Time Delay

Load Energized

Time

Delay on Make

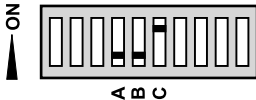Delay on Break Period

Mode Switch

(See programming instructions on Page 8)
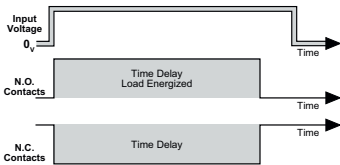

ON
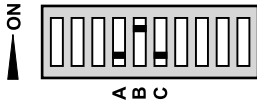
A B C

Interval

MODE OF OPERATION

When power is applied to the input, the contacts will transfer. After the time delay is complete, the contacts will return to their off state. The contacts will remain in the off state indefinitely unless power is reset.
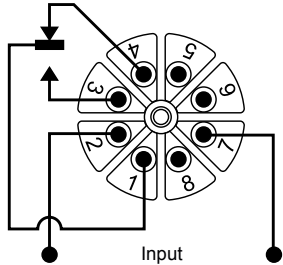
TIMING DIAGRAM

Mode Switch
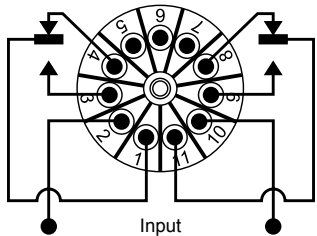
(See programming instructions on Page 8)

CONNECTION DIAGRAMS

**Single Pole Output
1 FORM C**

Input

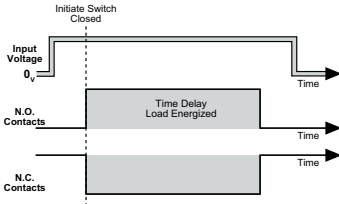**Double Pole Output
2 FORM C**

Input

Single Shot

MODE OF OPERATION

Power must be applied to the input terminals before and during the delay period. When the initiate contact closes, the output contacts transfer immediately and the time delay begins. The output contacts return to their original position when the delay period is complete.
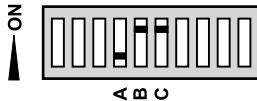
Note: The initial contact closure can be momentary or maintained. To reset the timer during the delay period, remove the input power.
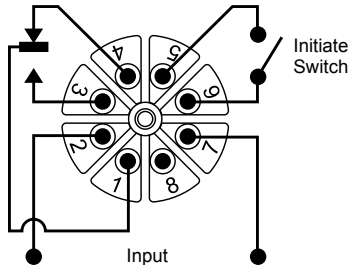
TIMING DIAGRAM

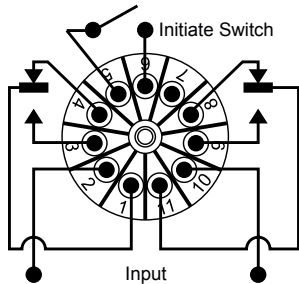

Mode Switch

(See programming instructions on Page 8)

CONNECTION DIAGRAMS

Single Pole Output
1 FORM C

Initiate Switch

Input

Double Pole Output
2 FORM C
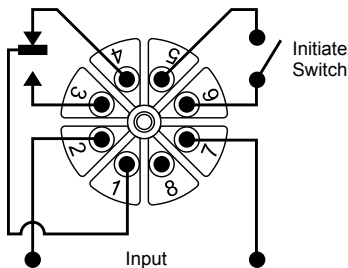

Initiate Switch

Input

5

Delay on Make / Delay on Break
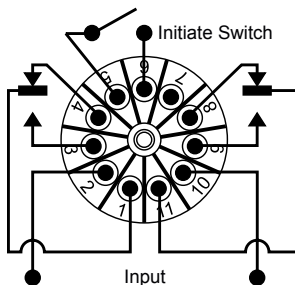
MODE OF OPERATION

Power must be applied at all times. Upon closure of the initiate switch, the delay on make period begins. Once complete, the contacts transfer and remain transferred as long as the initiate switch is closed. When the initiate switch opens, the delay on break period begins. Once complete, the contacts return to their original state and all time delays reset. If the initiate contact re-closes during the delay on break period, the contacts remain transferred and the delay on break is reset. Removal of input power resets all timing functions. Should the initiate contact open during the delay on make period, the delay on make period is reset to zero.
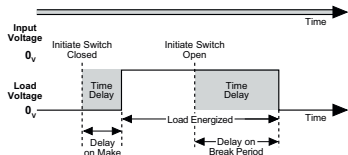
TIMING DIAGRAM

Mode Switch

(See programming instructions on Page 10)

CONNECTION DIAGRAMS

Single Pole Output
1 FORM C

Initiate Switch

Input

Double Pole Output
2 FORM C

Initiate Switch
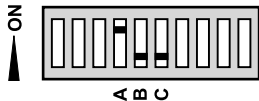
Input

Repeat Cycle

MODE OF OPERATION

The output contacts transfer immediately when power is applied to the input terminals, initiating the **ON** delay. Upon completion of the **ON** delay, the relay transfers and the **OFF** delay is initiated. Maintained power application allows the unit to recycle indefinitely.

TIMING DIAGRAM
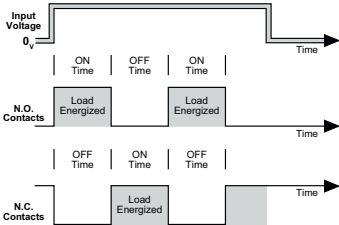
Mode Switch
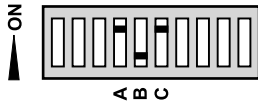
(See programming instructions on Page 10)

CONNECTION DIAGRAMS

**Single Pole Output
1 FORM C**

Input

**Double Pole Output
2 FORM C**

Input
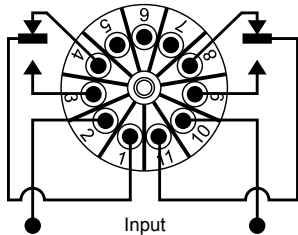
Programming for Single Time Delays

(DOM, DOB, Interval, and Single Shot)

SETTING THE MODE OF OPERATION

Mode of Operation	A	B	C
Delay on Make	OFF	OFF	OFF
Delay on Break	OFF	OFF	ON
Interval	OFF	ON	OFF
Single Shot	OFF	ON	ON
Delay on Make / Delay on Break	See Page 10		
Repeat Cycle			

SELECTABLE TIME RANGES

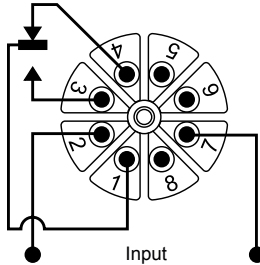- Timing range multipliers x0.1, x1, x10, or x100
- Timing in minutes or seconds
  (The example shown is set for "seconds" and the multiplier is x1)

TIMING ADJUSTMENT

- The time delay is adjusted by closing any combination of 10 binary code switches
- Transfer a switch to the **ON** position then add all the **ON** switch values for the total time delay
  (The example shown on Page 9 is set for 171 seconds)

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The example shown below is set for delay on make.

Step 1: Set the mode of operation (Single and dual modes are selected by transferring a combination of three mode switches).
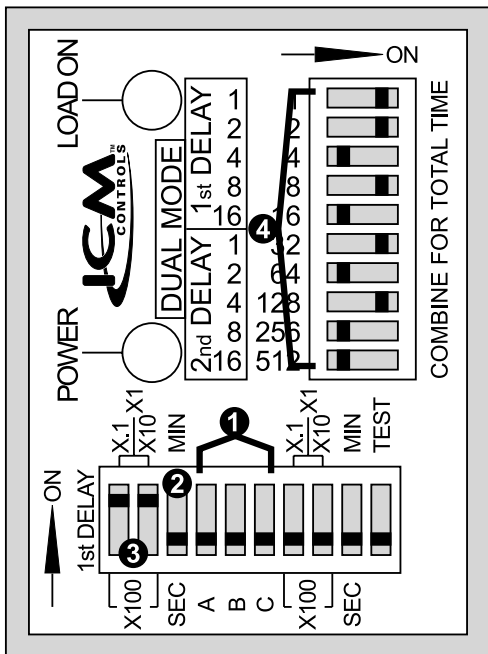
Step 2: Select minutes or seconds

Step 3: Select the multiplier

Step 4: Set the time delay

Programming for Dual Time Delays

(DOM/DOB, Repeat Cycle)

SETTING THE MODE OF OPERATION

Mode of Operation	A	B	C
Delay on Make			
Delay on Break	See Page 8		
Interval			
Single Shot			
Delay on Make / Delay on Break	ON	OFF	OFF
Repeat Cycle	ON	OFF	ON

SELECTABLE TIME RANGES

- Timing range multipliers x0.1, x1, x10, or x100
- Timing in minutes or seconds
  (In the example shown, the first time delay is set for "seconds" and the multiplier is x1)
  (The second time delay is set for "minutes", and the multiplier is x10)

TIMING ADJUSTMENT

- Each time delay is adjusted by closing any combination of five binary coded switches
- Transfer a switch to the **ON** position then add all the **ON** switch values for the total time delay
  (In the example shown, the first time is set for 11 seconds, the second for 50 minutes)

10

The example shown below is set for delay on make/delay on break.

Step 1: Set the mode of operation
Step 2: Select minutes or seconds – first time delay
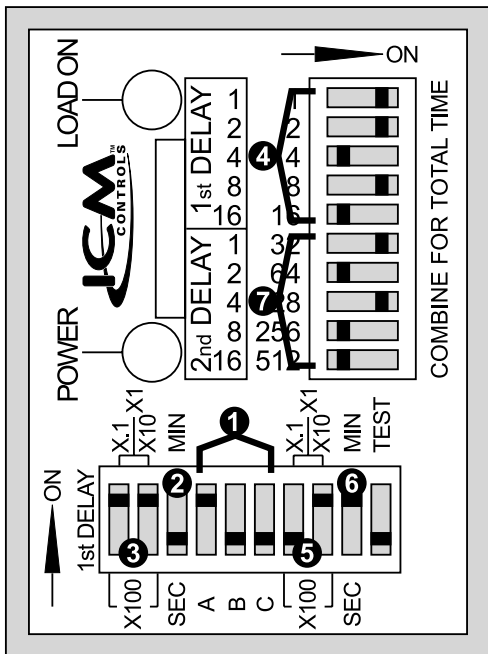**Step 3:** Select the multiplier – first time delay
Step 4: Set the first time delay
Step 5: Select the multiplier – second time delay
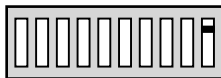**Step 6:** Select minutes or seconds – second time delay
Step 7: Set the second time delay

Testing the Unit

The test mode switch allows the user to test the electrical connections without changing the time delay settings. When the test mode switch is placed in the **ON** position, the contacts immediately transfer and remain transferred until the switch is turned **OFF** again. (Don't forget to turn it off.)

Ordering Information

ICM Series	Input Voltage	Output Type	Description
ICM500	24 VAC	Single Pole 1 FORM C 8-Pin	• Multi-mode; DOM, DOB, Interval, Single Shot, DOM/DOB and Repeat Cycle • Crystal Accuracy • Switch Settable Delays from 1 to 1,023 seconds in multiples of 0.1, 1, 10, and 100 seconds • Base to be ordered separately as an accessory item • For 8-pin order ASC-8 • For 11-pin order ASC-11
ICM501	115 VAC		
ICM502	230 VAC		
ICM503	12 VDC		
ICM504	24 VDC		
ICM505	110 VDC		

Note: For 11-pin base model, Double Pole, 2 FORM C, add suffix D
Example: ICM501D = 115 VAC, 11-pin

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ONE-YEAR LIMITED WARRANTY

The Seller warrants its products against defects in material or workmanship for a period of one (1) year from the date of manufacture. The liability of the Seller is limited, at its option, to repair, replace or issue a non-case credit for the purchase prices of the goods which are provided to be defective. The warranty and remedies set forth herein do not apply to any goods or parts thereof which have been subjected to misuse including any use or application in violation of the Seller's instructions, neglect, tampering, improper storage, incorrect installation or servicing not performed by the Seller. In order to permit the Seller to properly administer the warranty, the Buyer shall: 1) Notify the Seller promptly of any claim, submitting date code information or any other pertinent data as requested by the Seller. 2) Permit the Seller to inspect and test the product claimed to be defective. Items claimed to be defective and are determined by Seller to be non-defective are subject to a $30.00 per hour inspection fee. This warranty constitutes the Seller's sole liability hereunder and is in lieu of any other warranty expressed, implied or statutory. Unless otherwise stated in writing, Seller makes no warranty that the goods depicted or described herein are fit for any particular purpose.

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