

Introduction

Your Eagle-Signal brand B506 1/16 DIN timer is a powerful instrument which can be field configured to fit a wide variety of applications. The secondary setpoint can be used for a second time output, combining the function of two timers in a single package, or as a batch counter to track the amount of completed cycles. 1 ms resolution with transistor outputs make this unit well suited for high speed processes.

Inside this manual you will find complete information on the Control mode, which deals with viewing and changing the available setpoints, and Program Mode which is used to configure the basic operation of the timer, as well as set a variety of other useful features.

Also found in this manual are detailed timing diagrams and descriptions of the available operating functions to aid you in determining how to properly configure the unit to solve your application. Additionally included are key product specifications, warranty procedures and ordering information should you require additional units or accessories.

Should you require any additional assistance with the installation and operation of this product, please call our toll free application support line at 1-800-234-8731.



**Technical Manual
702118-0001**

**Eagle Signal brand
B506
High
Performance
LED Timer**

Features

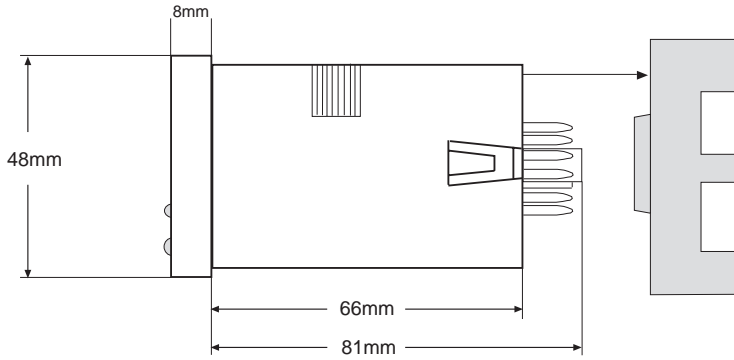
- 17 Different, field programmable, modes of operation
- Batch Count function with timed or latched output
- Dual setpoints in many modes
- Simple button per digit interface
- Timing resolution down to 1 ms
- Programmable security levels prevent unauthorized setpoint or program changes
- High Visibility LED display of both time value and setpoint
- Available with relay or solid state outputs
- IEC IP65 rated front panel
- Repeatability of 0.01%
- Inhibit input halts timing without resetting the cycle

Index

Overview	
Panel Mounting	page 2
Wiring Connections	page 2
Operation	
Front Panel	page 3
Control Mode	page 4
Configuration	
Program Mode	page 5 - 7
Timing Diagrams	page 8- 12
Program Flow Chart	page 13
General	
Specifications	page 14
Ordering Information	page 14
Notes Sheet	page 15
Warranty	page 16

OVERVIEW

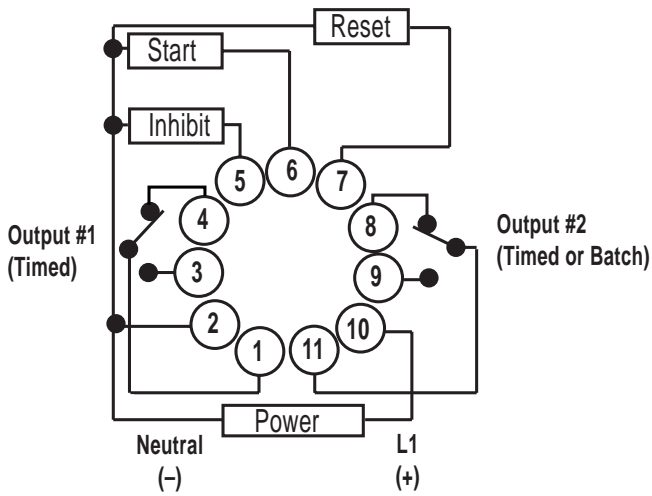
INSTALLATION



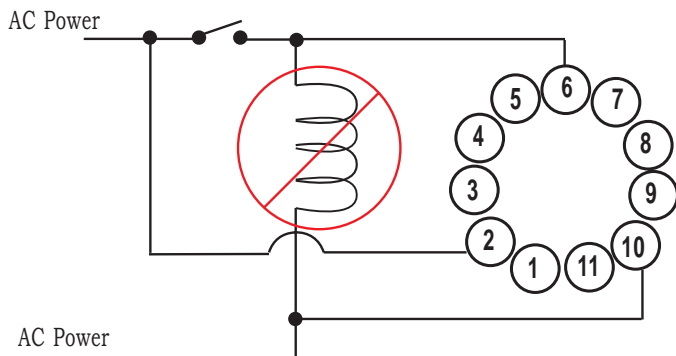
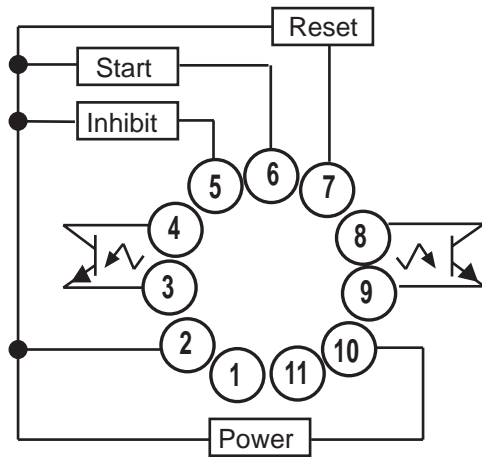
To wire the unit, an 11 pin socket is required. The unit can either be DIN rail mounted or panel mounted using the supplied mounting bracket. For panel mounting, place the unit in the cutout, then slide the bracket forward over the rear of the unit so that the tabs catch in the grooves on the housing and the bracket is as far forward as possible. Tighten the panel mount screws until there is a snug fit against the panel. Do not overtighten.

WIRING

B506-2001/2



B506-2051/2



Warning: Do Not connect a coil in parallel with the start signal for the B506, as pictured at left. Such a connection will cause the start signal to be continuously active. This situation also applies to the Reset and Inhibit inputs.

O P E R A T I O N

FRONT PANEL OPERATION

I/O Status Indicators

Illuminates to display when an input or output is active: "IN" for the start input, "O1" and "O2" for the timed outputs.

Preset 2 Indicator

Illuminates to indicate that Preset 2 is being shown on the lower display.

Numeric Keys

Each of the number keys is used to increment the value of the corresponding digit of the preset or parameter value.

Edit Key

In Control Mode: With "P" key, resets the displayed value.

In Program Mode: Scrolls between the applicable choices for the currently displayed parameter.

Primary Display

In Control Mode: Displays the current time value associated with the displayed preset or the batch value (if configured).

In Program Mode: Displays the Parameter Description.

Time Range Indicator

Illuminates to show the time base: H for hours, M for minutes, S for seconds. Multiple indicators will be illuminated when the time base is Hours:Minutes or Minutes:Seconds. During timing operation the illuminated LED will flash.

Batch Indicator

Illuminates to indicate that the Batch Count Value and Batch Preset are being displayed.

Set Value

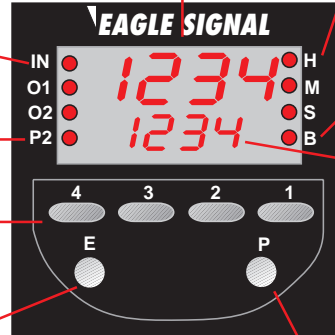
In Control Mode: Displays the settable value used to trigger the timed output(s) and the batch count (if configured).

In Program Mode: Displays the current selection for the chosen parameter.

Program Key

In Control Mode: Depressing the key will scroll the display among the preset and batch displays. Holding the key down for 3 seconds will shift the unit into Program Mode. With the "E" key, resets the displayed value

In Program Mode: Depressing the key will scroll the display from one parameter to the next. Holding the key down for 3 seconds will shift the unit to Control Mode.



OPERATION

CONTROL MODE



1

Preset 1 Display



2



Top display: Time Value for P1 Operation
Bottom display: Preset 1
Annunciators: Time Range

Pressing the numeric keys will cause the corresponding digit to increment by a value of one (i.e. the "1" key increments the rightmost digit, the "2" key the 2nd digit from the right, etc.). It is not necessary to press any other keys to enter the change, the new set point value will become effective immediately.



Please Note that based on the Operating Mode and Output 2 selection, Preset 2 may not be an available display.



1

Preset 2 Display



2



Top display: Time Value for P2 Operation
Bottom display: Preset 2
Annunciators: Time Range & P2

Changes are made in the same manner as for Preset 1 (detailed above).



Please Note that based on the Operating Mode and Output 2 selections, Batch may not be an available display.

Batch Display



1



2



Top display: Batch Count Value
Bottom display: Batch Count Preset
Annunciators: Batch

Changes are made in the same manner as for Preset 1 (detailed above).

CONFIGURATION

PROGRAM MODE

- Enter the Program Mode by holding down the "P" key for 3 seconds
- Press the "P" key to move the top display from one parameter to the next
- Press the "E" key to scroll the bottom display through the available choices for that parameter
- While in Program Mode, the unit will halt operation. Changes only become effective after returning to Control Mode by holding down the "P" key for 3 seconds

P
○ For 3 Seconds

Func
P E r C

P
○

Operating Function: Determines how output 1 will operate in relation to the Preset 1. Choices are:

- On Delay (OnDL)
- Off Delay (OffDL)
- Interval 1 (Int 1)
- Interval 2 (Int 2)
- On/Off Delay (OnOff)
- Delay/Interval (d Int)
- Accumulative (Acc)

A complete explanation, with timing diagrams, of each function can be found on page 8.

Out 2
P 2

P
○

Note: The following parameter will not appear if "Operating Function" is set to Off Delay, Delay/Interval or On/Off Delay. In these instances Output 2 automatically defaults to Batch Count.

Output 2 Operation: Determines the functionality of the 2nd output. Choices are:

- Preset 2 (P2): The unit will function as a dual setpoint timer, with output 2 linked to Preset 2.
- Batch Count (bC): Output 2 will be activated after a preset amount of Operations is completed. The preset value is input in the Batch Count screen in Control Mode.

P 2 0
AbS

Note: The following parameter will only appear if "Output 2" is set to Preset 2.

Preset 2 Operation: Determines how Preset 2 will operate in relation to Preset 1. The available choices vary based upon the selected "Operating Function":

For On-Delay and Accumulative:

- Absolute (Abs): Preset 2 is input as an absolute value, and the unit operates like two independent On-Delay timers.
- Prewarn (PrE): Preset 2 is set as a value relative to Preset 1. The input value for P2 is equal to the amount of time that Output 2 will activate prior to Output 1. Ex: If P1 = 20 seconds, and P2 equals 5, then output 2 will activate 15 seconds (20 - 5), after the timing cycle is initiated.

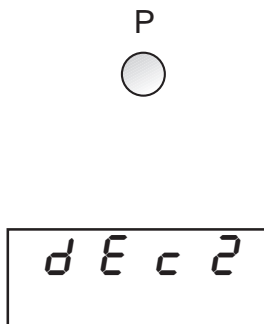
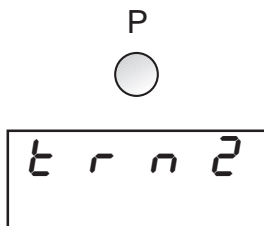
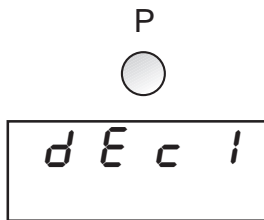
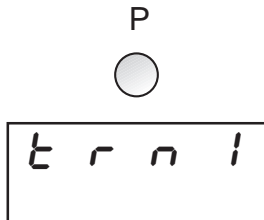
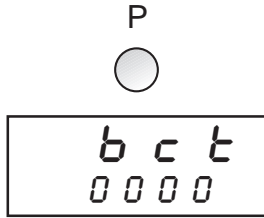
CONFIGURATION

For Interval 1 and Interval 2:

Begin Together (*bt*): Preset 2 is set as an independent time interval which will begin timing and activate Output 2 upon initiation of the start signal .

End Together (*Et*): Preset 2 is set as a value relative to Preset 1. The timing sequence for P2 will initiate at the appropriate time so that the timing sequences for P1 and P2 will end simultaneously and Output 1 and Output 2 will deactivate together.

Sequential (*SE*): Preset 2 is set as an independent time interval which will begin its timing sequence upon completion of the P1 interval.



Note: The following parameter will only appear if "Output 2" is set to Batch Count.

Batch Count Output: Sets the duration of Output 2, within a range from 1 second to 9999 seconds. A setting of 0000 will latch the output until a reset signal is received

Time Range 1 : Sets the unit of measure for the time values that will be used for Preset 1. The choices will not appear on the bottom display, but will be signified with the annunciator lights. Choices are:

- Seconds
- Minutes
- Hours
- Minutes:Seconds
- Hours:Minutes

Note: The following parameter will not appear if "Minutes:Seconds" or "Hours:Minutes" is chosen for Time Range 1.

Decimal Position for Time Range 1: Determines the resolution of the selected time range. Settable from 0000 to 0.000

Note: The following parameter will only appear for those configurations that provide a Preset 2 display.

Time Range 2 : Sets the unit of measure for the time values that will be used for Preset 2. The choices will not appear on the bottom display, but will be signified with the annunciator lights. Choices are:

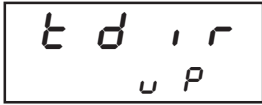
- Seconds
- Minutes
- Hours
- Minutes:Seconds
- Hours:Minutes

Note: The following parameter will not appear if "Minutes:Seconds" or "Hours:Minutes" is chosen for Time Range 2.

Decimal Position for Time Range 2: Determines the resolution of the selected time range. Settable from 0000 to 0.000.

C O N F I G U R A T I O N

P



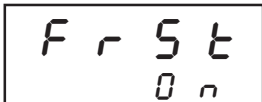
Timing Direction: Determines whether the time values for Preset 1 and 2 will increment from zero and change the state of the output at the set value (uP) or decrement from the set value and change the state of the output at zero (dn).

P



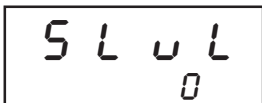
Power Reset Enable: After a loss of power, the unit can be programmed to either reset upon reapplication of power (0n) or continue from the point of power interruption (0FF).

P



Front Panel Reset Enable: When active (0n), the timing operation can be reset in Control Mode by simultaneously pressing the "E" and "P" keys. If inactive (0FF), the timing operation can only be reset through the remote input.

P



Security Level: 4 different levels of security are available:

0 = Full Access

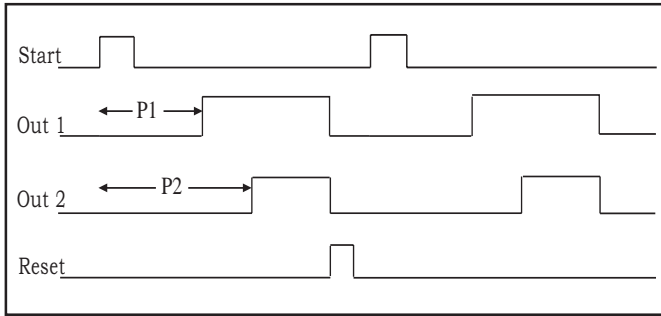
1 = SP Locked Out

2 = Access to Program Mode only by holding the "P" key for 10 seconds

3 = SP Locked Out and access to Program Mode only by holding the "P" key for 10 seconds

TIMING DIAGRAMS

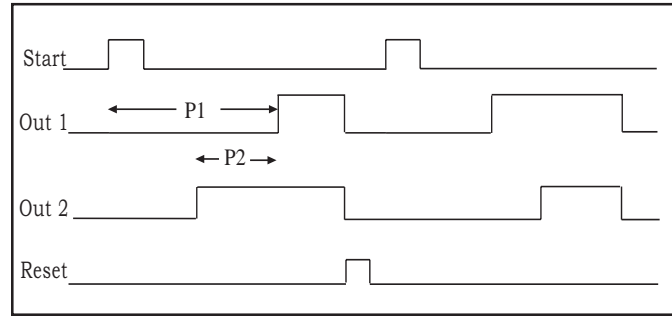
On Delay - Absolute



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1 or Reset
Preset 2 Timing	On leading edge of start signal	On completion of P2 or Reset
Output 1	Upon completion of P1	On Reset
Output 2	Upon completion of P2	On Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state. If the start input is applied during Reset, a new timing cycle will begin on the trailing edge of the Reset signal.

On Delay - Prewarn

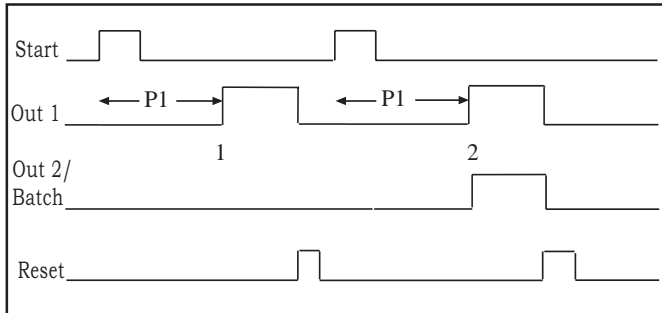


	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1 or Reset
Preset 2 Timing	Prior to completion of P1 by the amount of time set in P2	On completion of P2 or Reset
Output 1	Upon completion of P1	On Reset
Output 2	Prior to completion of P1 by the amount of time set in P2	On Reset

P1 must be set to a value greater than P2. An Inhibit input will halt all timing functions, but leave the outputs in their current state. If the start input is applied during Reset, a new timing cycle will begin on the trailing edge of the Reset signal.

CONFIRMATION

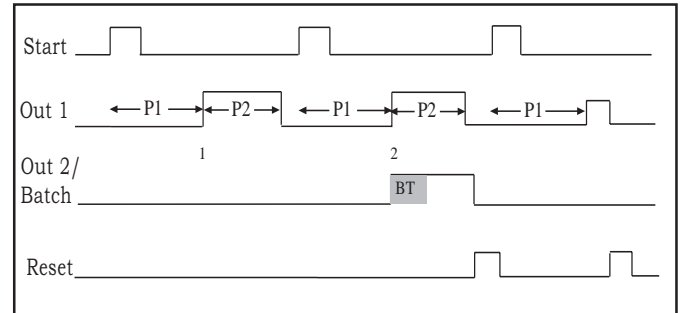
On Delay w/Batch



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1 or Reset
Batch Count	Accumulates on activation of Output 1	On Reset, only after the Batch Count Preset is reached
Output 1	On completion of P1	On completion of P1 or Reset
Output 2	When the Batch Count value equals the Batch Preset	On completion of Batch Output time or Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state. If the start input is applied during Reset, a new timing cycle will begin on the trailing edge of the Reset signal. The Remote Reset will only reset the Batch Count value after the Batch Preset has been reached, however, the Batch Count value can be reset at anytime via Front Panel Reset.

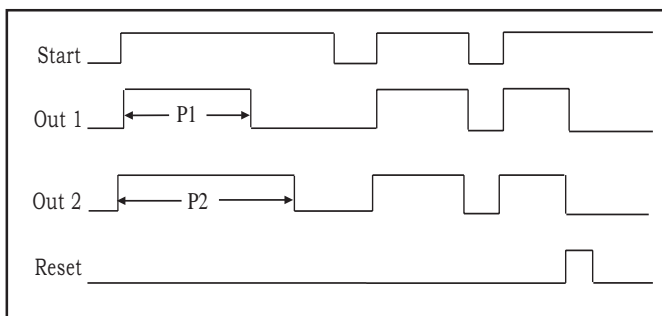
On Delay/Interval w/Batch



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1 or Reset
Preset 2 Timing	On activation of Output 1	On completion of P2 or Reset
Batch Count	Accumulates on falling edge of Output 1	On Reset, only after the Batch Count Preset is reached
Output 1	On completion of P1	On completion of P1 or Reset
Output 2	When the Batch Count value equals the Batch Preset	On completion of Batch Output time or Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state. A reset signal is not required to start a new P1 cycle. The Remote Reset will only reset the Batch Count value after the Batch Preset has been reached, however, the Batch Count value can be reset at anytime via Front Panel Reset.

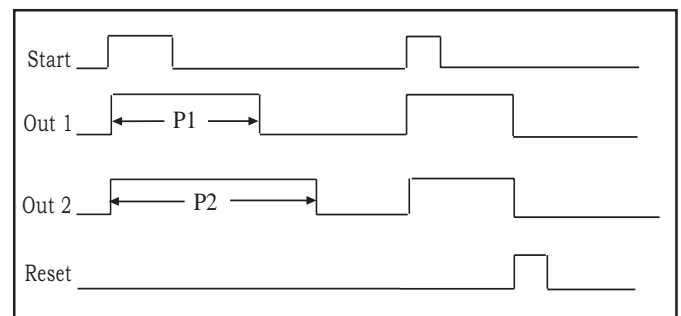
Interval 1 - Begin Together



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Preset 2 Timing	On leading edge of start signal	On completion of P2, deassertion of the Start Signal or Reset
Output 1	On leading edge of start signal	On completion of P2, deassertion of the Start Signal or Reset
Output 2	On leading edge of start signal	On completion of P2, deassertion of the Start Signal or Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state.

Interval 2 - Begin Together

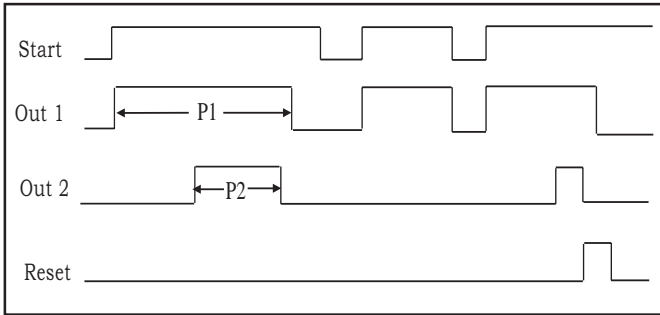


	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, or Reset
Preset 2 Timing	On leading edge of start signal	On completion of P2 or Reset
Output 1	On leading edge of start signal	On completion of P1 or Reset
Output 2	On leading edge of start signal	On completion of P2 or Reset

Operates the same as the Interval 1- Begin Together mode, except the start input does not have to be sustained to continue operation. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

CONFIGURATION

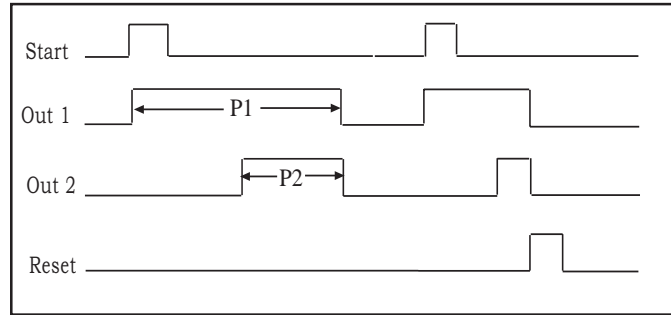
Interval 1 - End Together



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Preset 2 Timing	Prior to completion of P1 by the amount of time set in P2	On completion of P2, deassertion of the Start Signal or Reset
Output 1	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Output 2	Prior to completion of P1 by the amount of time set in P2	On completion of P2, deassertion of the Start Signal or Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state.

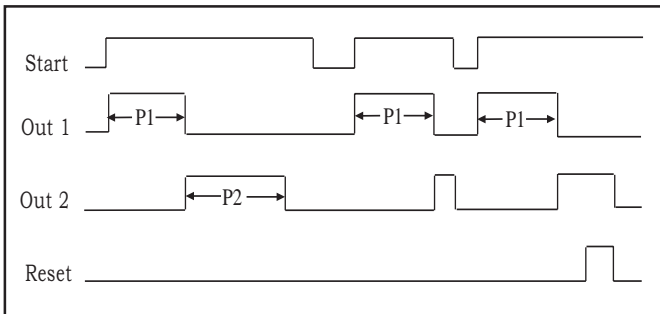
Interval 2 - End Together



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Preset 2 Timing	Prior to completion of P1 by the amount of time set in P2	On completion of P2, deassertion of the Start Signal or Reset
Output 1	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Output 2	Prior to completion of P1 by the amount of time set in P2	On completion of P2, deassertion of the Start Signal or Reset

Operates the same as the Interval 1-End Together mode, except the start input does not have to be sustained to continue operation. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

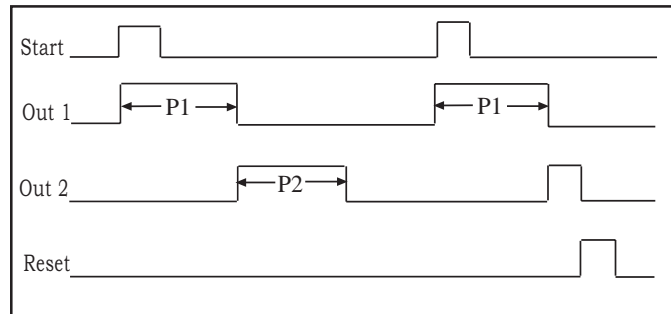
Interval 1 - Sequential



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Preset 2 Timing	On completion of P1	On completion of P2, deassertion of the Start Signal or Reset
Output 1	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Output 2	On completion of P2	On completion of P2, deassertion of the Start Signal or Reset

An Inhibit input will halt all timing functions, but leave the outputs in their current state.

Interval 2 - Sequential

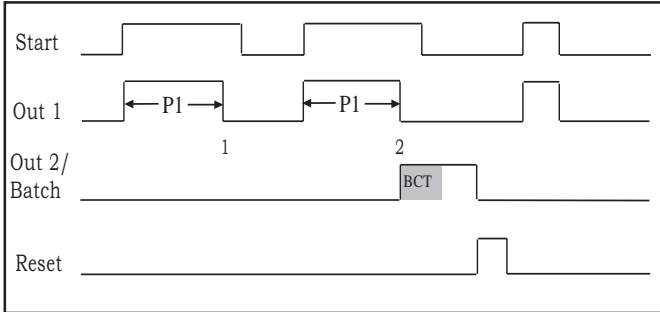


	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, or Reset
Preset 2 Timing	On completion of P1	On completion of P2, or Reset
Output 1	On leading edge of start signal	On completion of P1 or Reset
Output 2	On completion of P2	On completion of P2, or Reset

Operates the same as the Interval 1-Sequential mode, except the start input does not have to be sustained to continue operation. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

CONFIGURATION

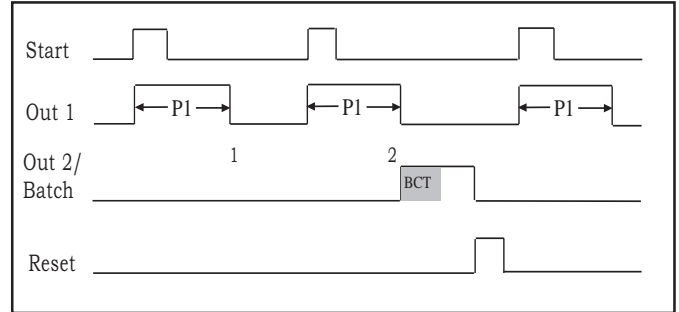
Interval 1 - Batch



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Batch Count	On trailing edge of Output 1	On Reset
Output 1	On leading edge of start signal	On completion of P1, deassertion of the Start Signal or Reset
Output 2	When the Batch Count Value equals the Batch Preset	On completion of the Batch Count Time or Reset

It is not necessary to reset the timer to begin a new interval, however reset is required to set the batch count value back to 0. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

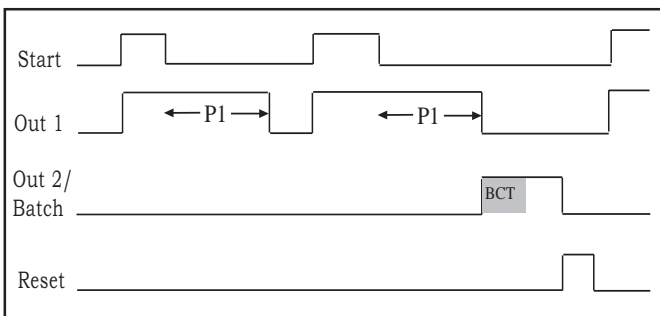
Interval 2 - Batch



	Activates	Deactivates
Preset 1 Timing	On leading edge of start signal	On completion of P1 or Reset
Batch Count	On trailing edge of Output 1	On Reset
Output 1	On leading edge of start signal	On completion of P1 or Reset
Output 2	When the Batch Count Value equals the Batch Preset	On completion of the Batch Count Time or Reset

It is not necessary to reset the timer to begin a new interval, however reset is required to set the batch count value back to 0. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

Off Delay - Batch Count

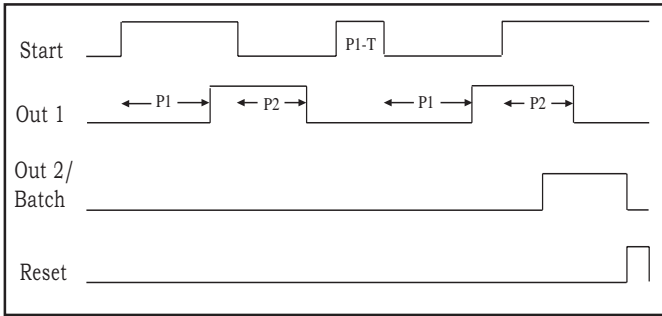


	Activates	Deactivates
Preset 1 Timing	On trailing edge of start signal	On completion of P1 or Reset
Batch Count	On trailing edge of Output 1	On Reset
Output 1	On leading edge of start signal	On completion of P1 or Reset
Output 2	When the Batch Count Value equals the Batch Preset	On completion of the Batch Count Time or Reset

It is not necessary to reset the timer to begin a new interval, however reset is required to set the batch count value back to 0. An Inhibit input will halt all timing functions, but leave the outputs in their current state. Start signals will be accepted while the Batch Count Output is active.

CONFIGURATION

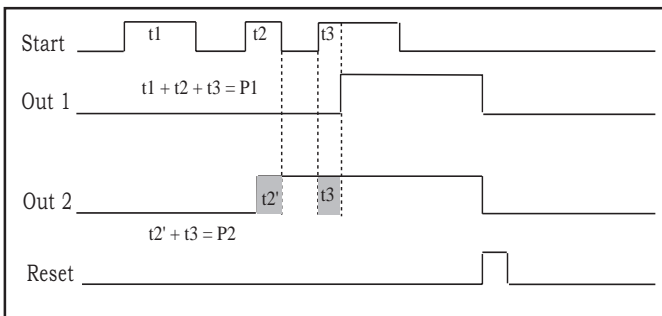
On/Off Delay - Batch Count



	Activates	Deactivates
Preset 1 Timing	On change of state of the start signal	On change of state of the start signal or reset
Preset 2 Timing	On change of state of the start signal after P1 has elapsed	On change of state of the start signal after P2 is active, or Reset
Batch Count	Accumulates on falling edge of Output 1	On expiration of the Batch Count Time or Reset
Output 1	On completion of P1	On completion of P2 or Reset
Output 2	When the Batch Count value equals the Batch Preset	On completion of Batch Output time or Reset

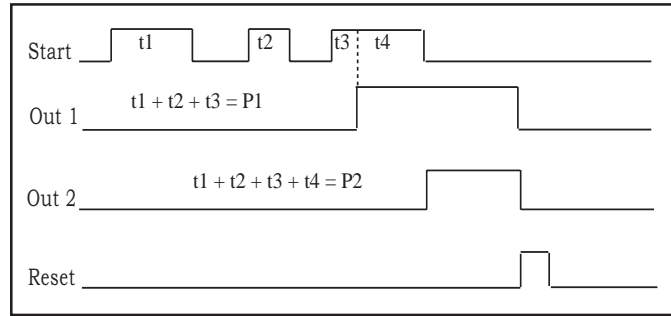
Any transition of the start signal will effect the timing operation: During the timing cycle for P1 a transition will cause P1 to restart. A transition of the start signal after P1 has completed will cause P2 to begin. Any transition of the start signal prior to the completion of P2 (and the deactivation of Output 1) will cause P2 to restart. An Inhibit input will halt all timing functions, but leave the outputs in their current state.

Accumulative - Prewarn



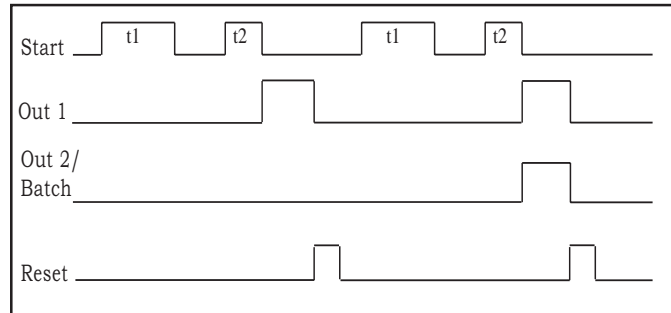
	Activates	Deactivates
Preset 1 Timing	On leading edge of each start signal	On completion of P1 or Reset
Preset 2 Timing	Prior to completion of P1 by the amount of time set in P2	On completion of P2 or Reset
Output 1	On completion of P1	On Reset
Output 2	Prior to completion of P1 by the amount of time set in P2	On Reset

Accumulative - Absolute



	Activates	Deactivates
Preset 1 Timing	On leading edge of each start signal	On completion of P1 or Reset
Preset 2 Timing	On leading edge of each start signal	On completion of P2 or Reset
Output 1	On completion of P1	On Reset
Output 2	On completion of P2	On Reset

Accumulative - Batch

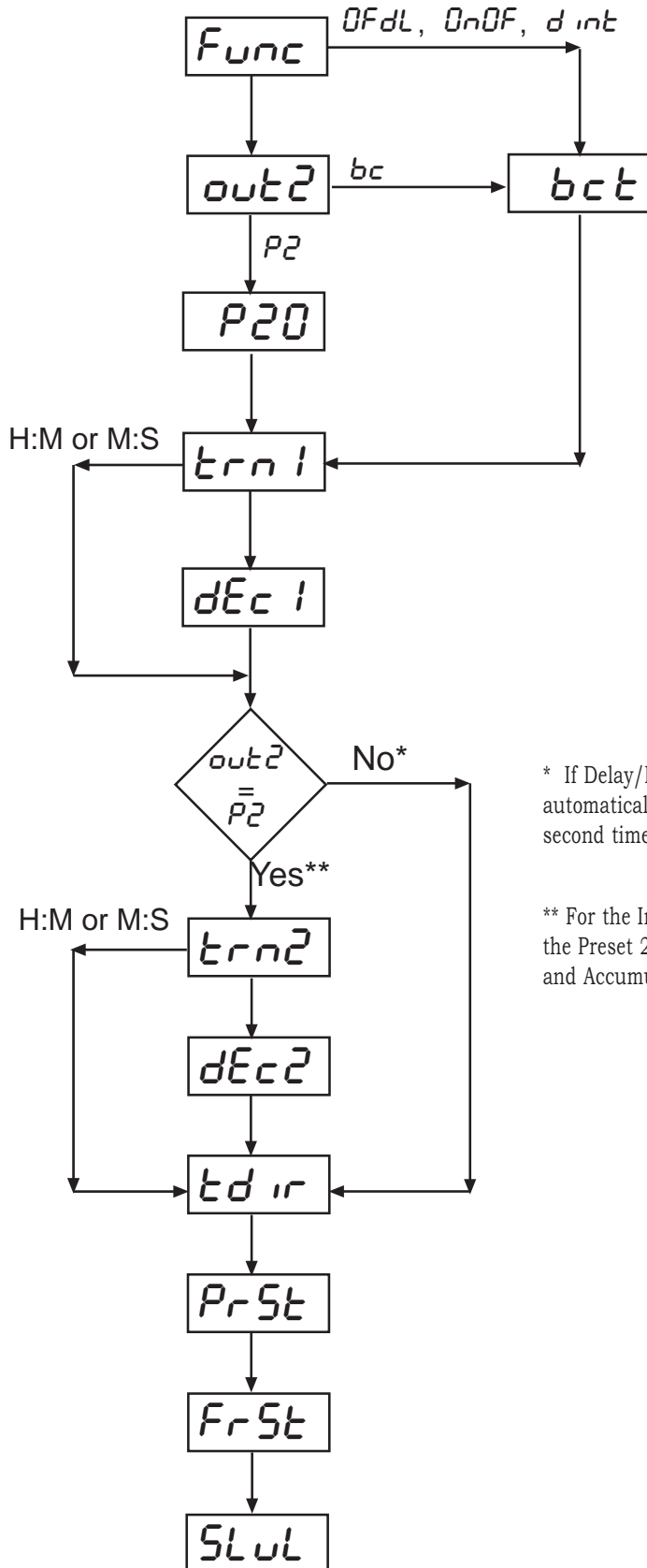


	Activates	Deactivates
Preset 1 Timing	On leading edge of each start signal	On completion of P1 or Reset
Batch Count	On leading edge of Output 1	On Reset, only after the Batch Count Preset is reached
Output 1	On completion of P1	On Reset
Output 2	When the Batch Count Value equals the Batch Preset	On Reset, only after the Batch Count Preset is reached

It is not necessary to reset the timer to begin a new interval, however reset is required to set the batch count value back to 0. An Inhibit input will halt all timing functions, but leave the outputs in their current state. Start signals will be accepted while the Batch Count Output is active

CONFIGURATION

PROGRAMMING OVERVIEW



* If Delay/Interval or On/Off are selected as the Operating Function, Out2 is automatically set to Batch. However, the P2 setting is still available, and the second time range is available.

** For the Interval 1 & Interval 2 modes, a second time range will not appear if the Preset 2 operation is set to End Together. This is also true for the On Delay and Accumulative Modes if Prewarn is the selection for Preset 2 Operation.

GENERAL

SPECIFICATIONS

Inputs

Start:	NPN or Dry Contact
Reset:	NPN or Dry Contact
Inhibit:	NPN or Dry Contact
Activation Time:	4 ms (B506-2XX2), 21 ms (B506-2XX1)
Impedance:	10 KΩ

Outputs

Relay (B506-200X):	2 SPDT (5 amp) - 15 ms max latency
Transistor (B506-205X):	NPN Open Collector - 30 VDC, 30 mA max, opto isolated

Physical

Dimensions:	48mm x 48mm, 85mm deep
Mounting:	Panel Mounting 45mm x 45mm cutout or DIN rail
Wiring Connection:	Via 11 pin plug in socket
Weight:	100 grams (3.5 ounces)

Operation

Supply Voltage:	85 - 264 VAC 50/60Hz, or 24 VAC/VDC
Power Consumption:	< 10 VA max @ 240 VAC, 200 mA @ 24 VDC
Time Ranges:	Hours, Minutes, Seconds, Hours:Minutes, Minutes:Seconds
Resolution:	Settable from XXXX to X.XXX for Hours, Minutes, and Seconds ranges
Repeat Accuracy:	± 0.01%
Display:	Dual line, 4 digit, 7 segment LED - 8mm high
Memory:	Nonvolatile retains settings when power is disengaged
Electrical Service Life:	100,000 cycles at full load
Mechanical Service Life:	10 million cycles at min. load

Environmental

Front Panel Rating:	IEC IP65
Operating Temperature:	0° to 55° C (32° to 131° F)
Storage Temperature:	-40° to 90° C (-40° to 194° F)
Humidity:	5% to 95% RH non-condensing
Approvals:	UL, CUL recognized - File #97337, CE certified

ORDERING INFORMATION

Description	Model #
High Performance Timer, Relay Out, 90-240 VAC	B506-2001
High Performance Timer, Relay Out, 24 VDC/AC	B506-2002
High Perf Timer NPN trans Out, 90-240 VAC	B506-2051
High Perf Timer, NPN trans Out, 24 VAC/DC	B506-2052

Description	Model #
11 Pin Socket - DIN Rail Mount	60SR2P06
11 Pin Socket - Outward facing terminals	PBT-03172

WARRANTY

Standard B506 products manufactured by the Company are warranted to be free from defects in workmanship and material for a period of two years from the date of shipment, and products which are defective in workmanship or material will be repaired or replaced, at the option of the Company, at no charge to the Buyer. Final determination as to whether a product is actually defective rests with the Company. The obligation of the Company hereunder shall be limited solely to repair and replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by the Company of written notice of any alleged defects or deficiency promptly after discovery within the warranty period, and in the case of components or units purchased by the Company, the obligation of the Company shall not exceed the settlement that the Company is able to obtain from the supplier thereof. No products shall be returned to the Company without its prior consent.

Products which the Company consents to have returned shall be shipped F.O.B. the Company's factory. The Company cannot assume responsibility or accept invoices for unauthorized repairs to its components, even though defective. The life of the products of the Company depends, to a large extent, upon the type of usage thereof, and THE COMPANY MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR SPECIFIC APPLICATIONS BY THE BUYER NOR AS TO PERIOD OF SERVICE UNLESS THE COMPANY SPECIFICALLY AGREES OTHERWISE IN WRITING AFTER THE PROPOSED USAGE HAS BEEN MADE KNOWN TO IT.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.