Pico™ Controller
Bulletin 1760

Getting Results
Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc. is prohibited.

Throughout this manual, when necessary we use notes to make you aware of safety considerations.

**WARNING**

Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**IMPORTANT**

Identifies information that is critical for successful application and understanding of the product.

**ATTENTION**

Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you:

- identify a hazard
- avoid a hazard
- recognize the consequence

**SHOCK HAZARD**

Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.

**BURN HAZARD**

Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.
### Table of Contents

**Preface**
- Who Should Use this Manual ......................................... Preface-i
- Purpose of This Manual ............................................ Preface-ii
- Common Techniques Used in this Manual ....................... Preface-ii
- Rockwell Automation Support ...................................... Preface-iii

**Chapter 1**

**Pico Controller**
- Safety Information .................................................. 1-1
- Simply Pico .......................................................... 1-1
- Mount Pico .......................................................... 1-3
- Connect Pico ......................................................... 1-4
- Pico Operating Principle .......................................... 1-10
- Menu Structure ...................................................... 1-15

**Chapter 2**

**Drawing a Circuit with Pico**
- Operation of Pico .................................................. 2-1
- Set the Menu Language ............................................ 2-2
- Set the Time ........................................................ 2-3
- Choose Pico Operating Mode ..................................... 2-4
- Pico Circuit Diagram Elements .................................. 2-5
- Example: Creating a Circuit Diagram ......................... 2-9
- Function Relay Types .............................................. 2-13
- Example: Use a Function Relay ................................. 2-20
- Basic Circuits ....................................................... 2-23

**Chapter 3**

**Pico Interface Socket**

**Appendix A**

**Specifications**
- Physical Specifications ............................................ A-1
- Product Selection Table .......................................... A-1
- Accessories ......................................................... A-3
- Dimensions .......................................................... A-4

**Index**
Read this preface to familiarize yourself with the rest of the manual. It provides information concerning:

- who should use this manual
- the purpose of this manual
- related documentation
- conventions used in this manual
- Rockwell Automation support

**Who Should Use this Manual**

Use this manual if you are responsible for designing, installing, programming, or troubleshooting control systems that use Pico controllers.

You should have a basic understanding of electrical circuitry and familiarity with relay logic. If you do not, obtain the proper training before using this product.
Purpose of This Manual

This manual provides a basic overview of Pico and an introduction to Pico programming. For a more detailed description of how to install and use your Pico Controller, refer to publication 1760-UM001, Pico Controller User Manual.

Related Documentation

The following documents contain additional information concerning Rockwell Automation products. To obtain a copy, contact your local Rockwell Automation office or distributor.

<table>
<thead>
<tr>
<th>For</th>
<th>Read this Document</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A more detailed description of how to install and use your Pico controller.</td>
<td>Pico Controller User Manual</td>
<td>1760-UM001</td>
</tr>
<tr>
<td>In-depth information on grounding and wiring Allen-Bradley programmable controllers</td>
<td>Allen-Bradley Programmable Controller Grounding and Wiring Guidelines</td>
<td>1770-4.1</td>
</tr>
<tr>
<td>A description of important differences between solid-state programmable controller products and hard-wired electromechanical devices</td>
<td>Application Considerations for Solid-State Controls</td>
<td>SGI-1.1</td>
</tr>
<tr>
<td>An article on wire sizes and types for grounding electrical equipment</td>
<td>National Electrical Code - Published by the National Fire Protection Association of Boston, MA.</td>
<td></td>
</tr>
<tr>
<td>A complete listing of current documentation, including ordering instructions. Also indicates whether the documents are available on CD-ROM or in multi-languages.</td>
<td>Allen-Bradley Publication Index</td>
<td>SD499</td>
</tr>
<tr>
<td>A glossary of industrial automation terms and abbreviations</td>
<td>Allen-Bradley Industrial Automation Glossary</td>
<td>AG-7.1</td>
</tr>
</tbody>
</table>

Common Techniques Used in this Manual

The following conventions are used throughout this manual:

- Bulleted lists such as this one provide information, not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.
- Italic type is used for emphasis.
Rockwell Automation offers support services worldwide, with over 75 Sales/Support Offices, 512 authorized Distributors and 260 authorized Systems Integrators located throughout the United States alone, plus Rockwell Automation representatives in every major country in the world.

Local Product Support

Contact your local Rockwell Automation representative for:

- sales and order support
- product technical training
- warranty support
- support service agreements

Technical Product Assistance

If you need to contact Rockwell Automation for technical assistance, please review the Troubleshooting chapter in the Pico Controller User Manual first. Then call your local Rockwell Automation representative.

You can also contact Rockwell Automation Technical Support. To reach our Technical Support, go to the following website to find the support site for your region.

- http://support.automation.rockwell.com/contactinformation/

Your Questions or Comments on this Manual

If you find a problem with this manual, or you have any suggestions for how this manual could be made more useful to you, please contact us at the address below:

Rockwell Automation
Control and Information Group
Technical Communication, Dept. A602V
P.O. Box 2086
Milwaukee, WI 53201-2086

or visit our internet page at:
http://www.ab.com/pico or http://www.rockwellautomation.com
Pico Controller

Safety Information

Electrical Shock Hazard

The electrical installation and commissioning work must only be carried out by suitably qualified personnel.

Do not work on the device when the power is turned on.

Observe the relevant safety regulations:

• Turn off the power
• Make sure that the device cannot be powered on again inadvertently
• Check to make sure that no dangerous voltages are present before working on the device

Simply Pico

Clever Switching and Controlling

Pico is a compact, user-friendly and low-cost controller for simple control applications. Applications range from building and domestic automation to machine and plant control. Pico has built-in user-friendly operating elements and an LCD display.

Connect Pico and draw a circuit diagram on the display by pressing the buttons on the device. Pico works with make contacts, break contacts, and relays.

Enter a circuit diagram in Pico just like it is sketched on paper. Pico has basic and advanced functions for relays, time switches and contactors, among other functions. Make changes to the circuit by pressing the buttons on the device. Time consuming rewiring is not necessary.
**Applications Everywhere**

- Building and domestic automation, controllers for lighting, doors, window shutters
- Control ventilators, rotating doors, greenhouses, exterior lighting, window controllers, shop display lighting
- Create controllers for temperature, ventilation and brightness levels
- Control machines and plant, presses, conveyor belts, oscillating conveyors, sorters, pumps

**Overview of Pico**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Incoming Power</td>
</tr>
<tr>
<td>2</td>
<td>Inputs</td>
</tr>
<tr>
<td>3</td>
<td>Power/Run LED</td>
</tr>
<tr>
<td>4</td>
<td>Keypad</td>
</tr>
<tr>
<td>5</td>
<td>Socket for memory module or PC interface cable</td>
</tr>
<tr>
<td>6</td>
<td>Outputs</td>
</tr>
<tr>
<td>7</td>
<td>LCD display</td>
</tr>
<tr>
<td>8</td>
<td>Write-On Surface</td>
</tr>
</tbody>
</table>
Mount Pico

Mount on DIN Rail

1. Hook Pico to the top edge of the DIN rail and rotate into place while pressing down slightly as shown by the arrow.

2. Pico will clip into place and is secured by the built-in spring mechanism.

Mount on a Mounting Plate

Pico can be screwed to a mounting plate with the three or four feet which are included.
Connect Pico

**Pico Inputs 1760-L12BBB-xx, 1760-L12BWB-xx and 1760-L12DWD-xx**

- **BWB**: $U_e = 24$ V (20.4 - 28.8 V), $I_e = 80$ mA
- **DWD**: $U_e = 12$ V (10.2 - 15.6 V), $I_e = 140$ mA

- $5 - 7$ lb-in.
- $3.5$ mm

**Pico Inputs 1760-L12AWA-xx and 1760-L12NWA-xx**

- $U_e = 120/240$ V, $50/60$ Hz (90 to 264 V)
- $I_e = 40$ mA $120$ V, $20$ mA $240$ V

- $5 - 7$ lb-in.
- $3.5$ mm

Pico Inputs 1760-L18BWB-EX and 1760-L18BWB-EXND
Pico Inputs 1760-L18AWA-xx and 1760-L18NWA-xx

Pico Outputs 1760-L18xxx

Pico Inputs 1760-L20xxx
Pico Outputs 1760-L20xxx

Pico Inputs 1760-IB12XOB8
Pico Outputs 1760-IB12XOB8

Pico Inputs 1760-IA12XOW6I and 1760-IB12XOW6I
Pico Outputs 1760-IA12XOW6I and 1760-IB12XOW6I

- 24 V ±0±8 A
- 120 V ±0±8 A
- 240 V ±0±8 A

Pico Outputs 1760-OW8

- 24 V ±0±8 A
- 115 V ±0±8 A
- 230 V ±0±8 A
**Pico Operating Principle**

**Pico Operating Buttons**

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Del</td>
<td>Delete object in the circuit diagram</td>
</tr>
<tr>
<td>Alt</td>
<td>Special functions in the circuit diagram</td>
</tr>
<tr>
<td>Cursor</td>
<td>Move cursor</td>
</tr>
<tr>
<td></td>
<td>Select menu item</td>
</tr>
<tr>
<td></td>
<td>Choose contact numbers, values, times, etc.</td>
</tr>
<tr>
<td>Ok</td>
<td>Next menu level, store your entry</td>
</tr>
<tr>
<td>Esc</td>
<td>Previous menu level, cancel your entry</td>
</tr>
</tbody>
</table>
Move Through Menus to Choose Values

<table>
<thead>
<tr>
<th>Press</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Del and Alt</td>
<td>Show system menu (press both keys at the same time).</td>
</tr>
<tr>
<td>Ok</td>
<td>• Go to next menu level.</td>
</tr>
<tr>
<td></td>
<td>• Select menu item.</td>
</tr>
<tr>
<td></td>
<td>• Store your entry.</td>
</tr>
<tr>
<td>Esc</td>
<td>Cancel your entry since the last Ok.</td>
</tr>
<tr>
<td>Arrow Keys</td>
<td>• Change menu item.</td>
</tr>
<tr>
<td></td>
<td>• Change value.</td>
</tr>
<tr>
<td></td>
<td>• Change position.</td>
</tr>
</tbody>
</table>

12-Point Status Display
18-Point and 20-Point Status Display

Inputs
Retention Enabled
Day, Time
Outputs

1...5...8....
RE I P
MO 02:00 ST
.2...5...8 RUN

Inputs 1, 5, 8 ON
Outputs 2, 5, 8 ON

Debounce Enabled/P-Buttons Enabled
Start-up Mode
Mode

Menu Display

Current choice blinks in the Pico menu

PROGRAM...
RUN...
PARAMETER
SET CLOCK...

PASSWORD...
RUN...
PARAMETER
SET CLOCK...

Main menu with and without password enabled
Cursor Display

There are two different cursor types:

Full block navigation is shown as a flashing block:

- Move cursor with the left/right arrows
- When in circuit diagram, also use up/down arrows

Parameter change cursor flashes the selected parameter:

- Change position with left/right arrows
- Change values with up/down arrows

Flashing values/menus are highlighted in grey in this manual.

Circuit Diagram Menu

Each rung can hold four instructions, three input instructions (contacts) and one output instruction (coil or relay). Rungs are connected together through branches at the three positions between instructions. All programming of Pico can be done using the display and keypad.
Circuit Diagram Symbols

- P: Cursor button as input
- I: Contact for input
- Q: Contact for output
- M: Contact for internal marker bits
- T: Contact for timer relay
- C: Contact for counter relay
- ☀: Contact for real time clock switch
- A: Analog comparator contact
- D: Contact for text display (1)
- : : Contact for jump (1)
- R: Expansion Inputs (1)
- S: Contact for internal marker relay or Expansion Output (1)

Coil Field

```
I1 - M2 - T1 - {Q1
I2 - Q1
I3 - M2 - T2 - {Q2
```

1st circuit connection
2nd circuit connection
3rd circuit connection
41st circuit connection
Last circuit connection

(1) For 1760-L18xxx only
Menu Structure

Main Menu Without Optional Password Protection

STOP: Circuit diagram menu
RUN: Power flow display

STOP
RUN
PARAMETER
INFO...
SET CLOCK

PROGRAM...
STOP RUN
PARAMETER
INFO...
SET CLOCK

PROGRAM...
STOP RUN
PARAMETER
INFO...
SET CLOCK

PROGRAM...
STOP RUN
PARAMETER
INFO...
SET CLOCK

PROGRAM...
STOP RUN
PARAMETER
INFO...
SET CLOCK

STOP
RUN
PARAMETER
INFO...
SET CLOCK

STOP
PARAMETER
INFO...
SET CLOCK

T1 X S +
T2 ü M:S +
C Parameter Display +
O1 +

T1 X S +
S1 10.000
S2 +0

HH:MM 14:23
DD.MM 17.03
YEAR 2004

Display for Setting Clock

Information Display of Device

Parameter Display

REPLACE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?

DELETE?
Main Menu Setting Summer Time

- SET CLOCK
- SUMMER TIME
- RULE...
- EU
- GB
- US
- SUMMER START
- SUMMER END
- AM
- HH:MM
- DD.MM:00.00
- HH.MM:00:00
- DIFF: 0:00
Main Menu with Password Protection

If you do not know the password, you can delete the old password, but the circuit diagram and data will also be deleted. To delete the password, press Ok to DELETE ALL after entering four incorrect passwords. (Pressing Esc retains the circuit diagram and data. You can then make another four attempts to enter the password.)
System Menu

System

Password Entry

Set Password

Change Password

ENTER PASSW: XXXX

CHANGE PW

ACTIVATE PW

ENTER PASSW: XXXX

CHANGE PW

ACTIVATE PW

Password RANGE...

PROGRAM /
PARAMETER /
CLOCK /
OPTNG MODE /
INTERFACE /
DELETE FUNCT

DEBOUNCE OFF

DEBOUNCE ON

MODE: STOP

MODE: RUN

DEBOUNCE OFF

DEBOUNCE ON

P ON

P OFF

RETENTION ON(2)

RETENTION OFF(2)

(1) Only for Pico 1760-L18xxx
(2) Only for Pico 1760-L12BWB-xx, -L12DWD and -L18xxx.

SYSTEM...

SECURITY...

LANGUAGE...

CONFIGURATOR
## Chapter 2

### Drawing a Circuit with Pico

#### Operation of Pico

#### Buttons for Drawing Circuit Diagrams

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="del.png" alt="Delete" /></td>
<td>Delete branch, contact, relay, or empty rung in the circuit diagram</td>
</tr>
</tbody>
</table>
| ![Alt](alt.png) | • Toggle between break and make contact  
  • Connect contacts and relays  
  • Add circuit connections |
| ![Up/Down Arrows](updown.png) | • Change value  
  • Move cursor up and down |
| ![Left/Right Arrows](leftright.png) | • Move cursor to left and right  
  • Change between parameters |
| ![Esc](esc.png) | • Go to previous menu level  
  • Undo settings from previous Ok  
  • Exit current display |
| ![Ok](ok.png) | • Go to next menu level  
  • Change, add contact/relay  
  • Save setting |
Set the Menu Language

Power Up Pico for the First Time

When you power-up Pico for the first time, you are asked to select the menu language.

Use the up and down cursor buttons to select a language. Definitions of the language abbreviations are shown below.

<table>
<thead>
<tr>
<th>Language</th>
<th>LCD display</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>ENGLISH</td>
<td>GB</td>
</tr>
<tr>
<td>German</td>
<td>DEUTSCH</td>
<td>D</td>
</tr>
<tr>
<td>French</td>
<td>FRANCAIS</td>
<td>F</td>
</tr>
<tr>
<td>Spanish</td>
<td>ESPANOL</td>
<td>E</td>
</tr>
<tr>
<td>Italian</td>
<td>ITALIANO</td>
<td>I</td>
</tr>
<tr>
<td>Portuguese</td>
<td>PORTUGUES</td>
<td>–</td>
</tr>
<tr>
<td>Dutch</td>
<td>NEDERLANDS</td>
<td>–</td>
</tr>
<tr>
<td>Swedish</td>
<td>SVENSKA</td>
<td>–</td>
</tr>
<tr>
<td>Polish</td>
<td>POLSKI</td>
<td>–</td>
</tr>
<tr>
<td>Turkish</td>
<td>TURKCE</td>
<td>–</td>
</tr>
<tr>
<td>Czeckh</td>
<td>CESKY</td>
<td>–</td>
</tr>
<tr>
<td>Hungarian</td>
<td>MAGYAR</td>
<td>–</td>
</tr>
</tbody>
</table>

A brief current surge is produced when powering on the unit for the first time. Do not switch the unit using reed contacts, since these may burn or melt.

Press **Ok** to confirm your choice or press **Esc** to exit the menu. The unit then switches to the status display. You can also change the language setting at a later date.

If you do not set the language, Pico displays this menu and waits for you to select a language every time the unit is powered up.
Set the Time

Controllers with the “-NC” designation do not have real time clocks.

Set the Real Time Clock

Set Week Day and Time
Winter/Summer Time (Daylight Savings Time)

Choose Pico Operating Mode

The two Pico operating modes are RUN and STOP.

- RUN: Pico processes the circuit diagram.
- STOP: Create and modify the circuit diagram.

The alternating RUN/STOP menu shows either RUN or STOP as follows:

- STOP mode active: RUN is shown
- RUN mode active: STOP is shown

Selectable Start-up Behavior

It is possible to select the operating mode to be activated when Pico is powered up. You can choose start-up in “RUN” mode or in “STOP” mode through the System Menu.
Pico Circuit Diagram

Elements

Contacts

Contacts are used to modify the flow of current in the circuit diagram. Contacts in the circuit diagram are either make or break contacts. Make contacts are open when off (de-energized) and closed when on. Break contacts are closed when off and open when on.

<table>
<thead>
<tr>
<th>Contact</th>
<th>Pico Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make contact; Open when off</td>
<td>I, Q, M, A, C, T, P, D, S, , R</td>
</tr>
<tr>
<td>Break contact; Closed when off</td>
<td>I, Q, M, A, C, T, P, D, S, R</td>
</tr>
</tbody>
</table>

Pico works with different contacts, which can be used in any order in the contact fields of the circuit diagram.

<table>
<thead>
<tr>
<th>Contact Type</th>
<th>Make Contact</th>
<th>Break Contact</th>
<th>1760-L12xxx</th>
<th>1760-L18xxx</th>
<th>1760-L20xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Inputs</td>
<td>I</td>
<td>I</td>
<td>I1 to I8</td>
<td>I1 to I12</td>
<td></td>
</tr>
<tr>
<td>0 signal</td>
<td></td>
<td></td>
<td>I13</td>
<td>I13</td>
<td></td>
</tr>
<tr>
<td>Expansion Status</td>
<td></td>
<td></td>
<td>–</td>
<td>I14(3)</td>
<td></td>
</tr>
<tr>
<td>Short-circuit/overload</td>
<td></td>
<td></td>
<td>–</td>
<td>I15 to I16</td>
<td></td>
</tr>
<tr>
<td>Soft Inputs - Keypad</td>
<td>P</td>
<td>P</td>
<td>P1 to P4</td>
<td>P1 to P4</td>
<td></td>
</tr>
<tr>
<td>Controller Outputs</td>
<td>Q</td>
<td>Q</td>
<td>Q1 to Q4</td>
<td>Q1 to Q8</td>
<td></td>
</tr>
<tr>
<td>Internal Marker Bits</td>
<td>M</td>
<td>M</td>
<td>M1 to M16</td>
<td>M1 to M16</td>
<td></td>
</tr>
<tr>
<td>Internal Marker Bits</td>
<td>N</td>
<td>N</td>
<td>N1 to N16</td>
<td>N1 to N16</td>
<td></td>
</tr>
<tr>
<td>Counters</td>
<td>C</td>
<td>C</td>
<td>C1 to C16</td>
<td>C1 to C16</td>
<td></td>
</tr>
<tr>
<td>Timers</td>
<td>T</td>
<td>T</td>
<td>T1 to T16</td>
<td>T1 to T16</td>
<td></td>
</tr>
<tr>
<td>Real Time Clock(1)</td>
<td></td>
<td></td>
<td>1 to 8</td>
<td>1 to 8</td>
<td></td>
</tr>
<tr>
<td>Analog Setpoint Compare(2)</td>
<td>A</td>
<td>A</td>
<td>A1 to A16</td>
<td>A1 to A16</td>
<td></td>
</tr>
<tr>
<td>Text Display</td>
<td>D</td>
<td>D</td>
<td>D1 to D16</td>
<td>D1 to D16</td>
<td></td>
</tr>
<tr>
<td>Expansion Outputs or Internal Marker Bits</td>
<td>S</td>
<td>S</td>
<td>S1 to S8</td>
<td>S1 to S8</td>
<td></td>
</tr>
<tr>
<td>Jump to Label</td>
<td>:</td>
<td>:</td>
<td>:1 to #:8</td>
<td>:1 to #:8</td>
<td></td>
</tr>
<tr>
<td>Expansion Inputs</td>
<td>R</td>
<td>R</td>
<td>–</td>
<td>R1 to R12</td>
<td></td>
</tr>
<tr>
<td>Expansion Overload Detection</td>
<td>R</td>
<td>R</td>
<td>–</td>
<td>R15 and R16(3)</td>
<td></td>
</tr>
</tbody>
</table>
### Relays

Pico has thirteen different types of relay for use in a circuit diagram.

<table>
<thead>
<tr>
<th>Relay Type</th>
<th>Pico Symbol</th>
<th>1760-L12xxx</th>
<th>1760-L18xxx</th>
<th>Coil Function</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Outputs</td>
<td>Q</td>
<td>Q1 to Q8</td>
<td>Q1 to Q8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Internal Marker Bits</td>
<td>M</td>
<td>M1 to M16</td>
<td>M1 to M16</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Internal Marker Bits</td>
<td>N</td>
<td>N1 to N16</td>
<td>N1 to N16</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Counters</td>
<td>C</td>
<td>C1 to C16</td>
<td>C1 to C16</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Timers</td>
<td>T</td>
<td>T1 to T16</td>
<td>T1 to T16</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Real Time Clock&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>☑️</td>
<td>☑️1 to ☑️8</td>
<td>☑️1 to ☑️8</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Operating Hours Counters</td>
<td>O</td>
<td>O1 to O4</td>
<td>O1 to O4</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Analog Setpoint Compare&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>A</td>
<td>A1 to A16</td>
<td>A1 to A16</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Text Display</td>
<td>D</td>
<td>D1 to D16</td>
<td>D1 to D16</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Jump to Label</td>
<td>:</td>
<td>:1 to :8</td>
<td>:1 to :8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Expansion Outputs or Internal Marker Bits</td>
<td>S</td>
<td>S1 to S8 (as marker)</td>
<td>S1 to S8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Year Time Switch</td>
<td>Y</td>
<td>Y1 to Y8</td>
<td>Y1 to Y8</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Master Reset</td>
<td>Z</td>
<td>Z1 to Z3</td>
<td>Z1 to Z3</td>
<td>X</td>
<td>–</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> Not available on “-NC” models.

<sup>(2)</sup> This applies only to the 1760-LxxBWB-xx and 1760-L12DWD.

The switching behavior of these relays is set using coil functions and parameters. The coil functions and parameters are listed with the description of each function relay type.
The options for setting output and marker relays are listed with the description of each coil function.

### Retentive Actual Values

With Pico 1760-L12BWB-xx, 1760-L12DWD, and 1760-L18xxx, it is possible to save the actual values of markers, timers and counters in the event of a power failure. The quantities and values that may be retained are found in the following table.

For further information see the *Pico Controller User Manual*, publication number 1760-UM001B-EN-P.

### Retentive Relays

<table>
<thead>
<tr>
<th>Relay Type</th>
<th>Pico Symbol</th>
<th>1760-L12BWB-xx</th>
<th>1760-L12DWD</th>
<th>1760-L18xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Marker Bits</td>
<td>M</td>
<td>4 (M13 to M16)</td>
<td>4 (M13 to M16)</td>
<td></td>
</tr>
<tr>
<td>Counters</td>
<td>C</td>
<td>1 (C8)</td>
<td>4 (C5, C6, C7, C8)</td>
<td></td>
</tr>
<tr>
<td>Timers</td>
<td>T</td>
<td>1 (T8)</td>
<td>2 (T7, T8)</td>
<td></td>
</tr>
<tr>
<td>Text Display</td>
<td>D</td>
<td>–</td>
<td>8 (D1 to D8)</td>
<td></td>
</tr>
</tbody>
</table>
Basic Output Energize

Maintained/Flip-Flop Output

Latching Output

Set Instruction

Reset Instruction
Example: Creating a Circuit Diagram

Interconnect Contacts and Relays

Connecting Pico

1. Connect S1 to Pico input terminal I1
2. Connect S2 to Pico input I2
3. Connect load M1 to Pico output Q1

Draw Circuit in Circuit Diagram Menu

Start Status Display

1...5...8.....
RE I P
MO 02:00 ST
.2...5...8 RUN

Start Status Display

or

12-I/O Pico

18-I/O Pico

Insert Contact “I1”
Insert Contact "I2"

Draw Connection Between Contact and Relay Coil

Choose Relay Coil “Q1”
Change Operating Mode

Pico now in RUN mode

Test Circuit Diagram

Power flow display
Operate Switch “S1” and “S2”

“S1” on
I1-I2----(Q1

“S2” on
I1-I2----(Q1

Relay “Q1” picks up

Return to Status Display with ESC

In the next example, a timing relay will be added to the circuit.

Status display is activated.
Choose STOP mode.

Program...
Run
Parameter
Set Clock...
## Function Relay Types

<table>
<thead>
<tr>
<th>Circuit Diagram Symbol</th>
<th>Function Relay Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Timing relay with on-delay, with and without random switching" /></td>
<td>Timing relay with on-delay, with and without random switching</td>
</tr>
<tr>
<td><img src="image" alt="Timing relay with off-delay, with and without random switching" /></td>
<td>Timing relay with off-delay, with and without random switching</td>
</tr>
<tr>
<td><img src="image" alt="Timing relay, single pulse" /></td>
<td>Timing relay, single pulse</td>
</tr>
<tr>
<td><img src="image" alt="Timing relay, flashing" /></td>
<td>Timing relay, flashing</td>
</tr>
<tr>
<td><img src="image" alt="Counter relay, up/down counter" /></td>
<td>Counter relay, up/down counter</td>
</tr>
<tr>
<td><img src="image" alt="Time switch, weekday/time (only in Pico models with clock)" /></td>
<td>Time switch, weekday/time (only in Pico models with clock)</td>
</tr>
<tr>
<td><img src="image" alt="Analog comparator relay (only in Pico models with 24V dc)" /></td>
<td>Analog comparator relay (only in Pico models with 24V dc)</td>
</tr>
</tbody>
</table>

## Timing Relay

![Timing Relay with on delay, with and without random switching](image)
With random switching, the relay contact switches randomly at any time up to the specified time value (shown shaded in figure).
Timing Relay, Flashing

Flash Frequency = 1/2 x setpoint

Parameter Display for Timing Relays
Counter Relay

Parameter Display for Counter Relays
Real Time Switch

**Example:** Real Time Switch 1 switches on Monday through Friday between 6:30 and 9:00 and again between 17:00 and 22:30 (5:00 pm and 10:30 pm).

![Parameter Display for Real Time Switches](image)

Parameter Display for Real Time Switches

Real Time Switch Number

<table>
<thead>
<tr>
<th>Week Day(s) from - to</th>
<th>On Time</th>
<th>Off Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO - FR</td>
<td>06:30</td>
<td>09:00</td>
</tr>
<tr>
<td>SU</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Parameter Display (Access Control)
Analog Comparator

Available functions:

- \( I_7 \geq I_8, I_7 \leq I_8 \)
- \( I_7 \geq \text{Setpoint}, I_7 \leq \text{Setpoint} \)
- \( I_8 \geq \text{Setpoint}, I_8 \leq \text{Setpoint} \)

The analog comparator can compare voltages from 0V to 10V (setpoints “0.0” to “10.0”).

**TIP**

Analog signals of sensors typically fluctuate by several millivolts. For stable switching the setpoints should differ by at least 0.2V (switching hysteresis). Do not use any relay with output energize or impulse relay coil functions.

Parameter Displays for Analog Comparators

Compare inputs I7 and I8.

![Diagram of Analog Comparator](image)

Compare input “I7” to a setpoint.

![Diagram of Analog Comparator with Setpoint](image)

Compare input “I7” to a setpoint.
Text Display

The Text Display is used to display eight freely definable messages on the Pico screen. Each text block displays up to 48 characters from the Pico display character set (ASCII + Pico special characters). If the Text Display is enabled, the text entered via PicoSoft is displayed. If several Text Displays are enabled, the next screen is displayed every 4 seconds. When Text Display D1 is enabled it stays displayed (fault indication).

Press Ok to switch to the menus at any time.

Current values or parameters of function relays can be displayed in lines 2 and 3.

Examples:

Fault Signals

| CAUTION! | PUMP 1 |
| MOTOR    | MALFUNCTION |

Time with Text Display

| THE TIME IS | 14:42 |

Display Counter Value

| QUANTITY | ACTV 0042 |
| PCS      | SETP0100 |

Display Current Value and Parameter of Timing Relay

| TIME RELAY 1 |
| SETP99.00 S |
| ACTV 42.00 S |
**Example: Use a Function Relay**

**Conventional Circuit**

![Conventional Circuit Diagram]

Pico switches M1 with 10 seconds delay.

**Select an Internal Marker Relay**

Start Circuit from first example

Position cursor on "Q"

**Select Marker Contact and Connect to New Output Relay**

![Select Marker Contact Diagram]
Select Trigger Relay for Time

Insert Timing Relay Contact

Select Parameter Access
Set “10 Seconds”

Connect Timing Relay Contact to New Output Relay

Change Pico to RUN to test the program. Test the circuit as shown for the first example. To display and access the parameters for the timing relay and change the time value in RUN mode, position the cursor in the circuit diagram on the “T” of “T1” and press Ok.
Basic Circuits

Significance of Logic Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>“0”</td>
<td>Make contact open, break contact closed, relay coil not energized</td>
</tr>
<tr>
<td>“1”</td>
<td>Make contact closed, break contact open, relay coil energized</td>
</tr>
</tbody>
</table>

### Negation (NOR)

<table>
<thead>
<tr>
<th>I1</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

### Permanent Contact (Unconditional Rung)

<table>
<thead>
<tr>
<th>---</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Flip-Flop Output

<table>
<thead>
<tr>
<th>I1</th>
<th>State</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0 to 1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0 to 1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Series Connection (AND)

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Parallel Connection (OR)

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Exclusive OR Circuit (XOR)

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Motor Start/Stop Circuit

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>Contact Q1</th>
<th>Coil Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Alternatively:

I1----I2-----{Q1
Q1

I1-------SQ1
I2-------RQ1
Pico Interface Socket

The Pico interface socket, which is beneath a protective cap, accepts the optional Pico memory module, or connects Pico to a PC using the optional PC interface cable and the PicoSoft software. This allows you to copy the circuit diagrams to and from the PC and/or memory module.

Memory Module

Memory modules are available as an optional accessory. Each memory module can store a single Pico circuit diagram. Information stored on the memory module is non-volatile (the information is not lost when the power is turned off). The memory module can be used to make a backup copy of a program and/or to transfer it to another Pico controller.

Each memory module can hold one Pico program, up to 32K.

Each memory module stores:

- the circuit diagram
- all parameter settings of the circuit diagram
- system settings

1760-MM1 for all 1760-L12xxx controllers

1760-MM2 for the 1760-L18xxx controllers
ELECTRICAL SHOCK HAZARD

The memory module and PC-cable socket are at the potential of L2. There is a danger of electric shock if L2 is not grounded. Do not make contact with electrical components under the socket cover.

Load or Store the Circuit Diagram

You can only transfer the program from Pico to the memory module or vice versa in the STOP mode.

DEVICE - CARD: Transfer circuit diagram and parameter settings from Pico to the memory module.

CARD - DEVICE: Transfer circuit diagram and parameter settings from the memory module to Pico.

DELETE CARD: Delete the contents of the memory module.

Available Memory Modules

The following memory modules are available as Pico accessories.

<table>
<thead>
<tr>
<th>Pico Controller</th>
<th>Memory Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760-L12xxx</td>
<td>1760-MM1 (Series A only)</td>
</tr>
<tr>
<td>1760-L18xxx</td>
<td>1760-MM2 (Series A only)</td>
</tr>
<tr>
<td>Series B Pico Controllers</td>
<td>1760-MM2B</td>
</tr>
</tbody>
</table>

Programs including all relevant data can be transferred from the 1760-MM2B memory module to the Series B Pico Controllers. The existing 1760-MM1 and 1760-MM2 memory modules are Read-Only when used with Series B Pico Controllers. The 1760-MM2B memory module will not work with Series A Pico Controllers.
PicoSoft

PicoSoft is an optional PC program that creates, stores, and manages Pico circuit diagrams. It transfers the circuit diagrams from the PC to Pico or vice versa using a special PC interface cable.

**ATTENTION**

The PC interface cable is catalog number 1760-CBL-PM02 and is available as an accessory item. Only use the Pico interface cable. Do not attempt to make your own cable as this can cause damage to the unit or present a shock hazard.

The PicoSoft software also includes extensive on-line Help.

To use the on-line Help, start PicoSoft and choose Contents in the Help menu. Context sensitive help is also available. Choose a menu item with the mouse and press F1 while keeping the mouse button pressed.

**Software Compatibility**

If you are using programming software to program the Pico controller, be sure that you are using the correct software version.

**IMPORTANT**

PicoSoft version 6.1 or higher must be used to for the Series B Pico controller. Earlier versions of PicoSoft can only be used with Series A Pico controllers.

**Find the Series Letter**

The Series letter is printed on the side of the housing as shown.

**Download the Software**

You can download a free copy of PicoSoft version 6.1 from our web site. Go to [http://www.ab.com/picosoft6](http://www.ab.com/picosoft6).

For PicoSoft Pro, please contact your Allen-Bradley Distributor or Rockwell Automation representative.
Appendix A

Specifications

Physical Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>200g (7 oz)</td>
<td>300g (10.6 oz)</td>
<td>70g (0.154 lb)</td>
</tr>
<tr>
<td>Ambient temperature, (operation)</td>
<td>-25°C to + 55°C (-18°F to 131°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C to +70°C (-40°F to +158°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>5 to 95%, non-condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emitted interference, interference immunity</td>
<td>EN 55011, EN 55022, Class B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards and regulations Approvals</td>
<td>EN 50178, UL, CSA, CE, C-Tick</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Product Selection Table

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Line Power</th>
<th>Real Time Clock</th>
<th>Display and Keypad</th>
<th>Analog</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760-L12AWA</td>
<td>8 (120/240V ac)</td>
<td>4 (relay)</td>
<td>100 - 240V ac</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1760-L12AWA-NC(1)</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L12AWA-NBD(2)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1760-L18AWA</td>
<td>12 (120/240V ac)</td>
<td>6 (relay)</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1760-L18AWA-EX(3)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1760-L18AWA-EXND(2)(3)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Publication 1760-GR001C-EN-P - April 2005
<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Line Power</th>
<th>Real Time Clock</th>
<th>Display and Keypad</th>
<th>Analog</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760-L12BWB</td>
<td>8 (24V dc)</td>
<td>4 (relay)</td>
<td>24V dc</td>
<td>Yes</td>
<td>Yes</td>
<td>2 (0 to 10V dc)</td>
</tr>
<tr>
<td>1760-L12BWB-NC(1)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L12BWB-ND(2)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L12BBB</td>
<td>8 (24V ac)</td>
<td>4 (MOSFET)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L12BBB-ND</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L18BWB-EX(3)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L18BWB-EXND(2)(3)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1760-L20BBB-EX(3)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
| (1) NC = no real time clock  
(2) ND = no display  
(3) EX = suitable for use with expansion modules
### Expansion Modules

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Line Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760-IA12XOW6I</td>
<td>12 (100 - 240V ac)</td>
<td>6 (relay)</td>
<td>100 - 240V ac</td>
</tr>
<tr>
<td>1760-IA12XOW4IF</td>
<td>12 (100 - 240V ac)</td>
<td>4 (relay)</td>
<td>100 - 240V ac</td>
</tr>
<tr>
<td>1760-IB12XOW6I</td>
<td>12 (24V dc)</td>
<td>6 (relay)</td>
<td>24V dc</td>
</tr>
<tr>
<td>1760-IB12XOB8</td>
<td>12 (24V dc)</td>
<td>8 (transistor)</td>
<td>24V dc</td>
</tr>
<tr>
<td>1760-DW2</td>
<td>-</td>
<td>2 (relay)</td>
<td>24V dc</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760-MM1</td>
<td>Memory Module for 12 I/O Pico Controller</td>
</tr>
<tr>
<td>1760-MM2</td>
<td>Memory Module for 18 I/O Pico Controller</td>
</tr>
<tr>
<td>1760-MM2B</td>
<td>Memory Module for Pico Series B Controllers</td>
</tr>
<tr>
<td>1760-CBL-PM02</td>
<td>Programming Cable for Pico Controller</td>
</tr>
<tr>
<td>1760-RPLCONN</td>
<td>Expansion Module Connector - included with expansion module. Catalog number listed is replacement part.</td>
</tr>
<tr>
<td>1760-SIM</td>
<td>Input Simulator for 12 I/O 24V dc Pico Controller</td>
</tr>
<tr>
<td>1760-PICOSOFT</td>
<td>Configuration Software for Pico Controllers.</td>
</tr>
<tr>
<td>D1760GR001BENP</td>
<td>Pico Controllers Getting Results Manual, publication number 1760-GR001B-EN-P</td>
</tr>
<tr>
<td>D1760UM001BENP</td>
<td>Pico Controllers User Manual, publication number 1760-UM001B-EN-P</td>
</tr>
</tbody>
</table>
Specifications

Dimensions

Pico 1760-L12xxx

Pico 1760-L18xxx, 1760-L20xxx and Expansion Modules
Pico 1760-OW2 Expansion Module

Dimensions of the 1760-RM… Remote Processor modules
Index

A
accessories A-3
Allen-Bradley
contacting for assistance Preface-iii
support Preface-iii
Analog comparator 2-18

B
Basic circuit
Exclusive OR circuit (XOR) 2-24
Flip-flop output 2-23
Impulse relay 2-23
Motor start/stop circuit 2-25
Negation (NOR) 2-23
Permanent contact 2-23
Series connection (AND) 2-24
Break contact 2-5
Buttons 1-10
Use in circuit diagrams 2-1

C
Cable 3-3
Change operating mode 2-4
Circuit diagram
Access relay parameters 2-21
Choosing relay type 2-10
Displaying 2-9
Example 2-9, 2-20
Inserting contacts 2-9
Loading 3-2
Select marker relay 2-20
Storing 3-2
Symbols 1-14
Testing 2-11
Using a function relay 2-20
Using buttons in 2-1
Circuit diagram elements 2-5
Coil function 2-8
common techniques used in this manual
Preface-ii
contacting Allen-Bradley for assistance
Preface-iii
Contactor function 2-8
Contacts
Overview 2-5
Counter relay 2-16
Parameter display 2-16
Cursor display 1-13

dimensions
1760-L12 A-4
1760-L18 A-4
1760-L20 A-4
1760-OW2 A-5
1760-RM A-5
expansion modules A-4

E
Example
Basic circuits 2-23
Circuit diagram 2-9
Contacts and relays 2-9
Example of function relay 2-20

F
Function relays
Analog comparator 2-18
Counter relay 2-16
Overview 2-13
Text display 2-19
Time switch 2-17
Timing relay 2-13

K
Keypad 1-10

L
Logic tables 2-23

M
Make contact 2-5
manuals, related Preface-ii
Memory Module (optional) 3-1
Menu guidance 1-11
Menu structure 1-15
Mounting 1-3

O
Operating buttons 1-10

P
Parameter display
Analog comparator 2-18
Counter relay 2-16
For timing relays 2-15
Time switch 2-17
Index

physical specifications A-1
Overview of Pico 1-2
PicoSoft 3-3
Programming cable 3-3
publications, related Preface-ii
Purpose of this Manual Preface-ii

R
related publications Preface-ii
Relay types
  Overview 2-6

S
selection table
  controllers A-1
selections table
  expansion modules A-3
Setting the time 2-3
Setting week day 2-3
Software 3-3
specifications
  physical A-1
Startup behavior 2-4
Status display 1-12
Summer time 2-4

Symbols in circuit diagram 1-14
System menu 1-18

T
Terminals, inputs/outputs 1-4
Text display 2-19
Time switch 2-17
  Parameter display 2-17
Timing relays 2-13
  Parameter display 2-15
troubleshooting
  contacting Allen-Bradley for assistance Preface-iii

W
Winter time 2-4
Wiring diagrams
  1760-L12AWA-NC, 1760-L12AWA, and 1760-L12AWA-ND 1-4
  1760-L12AWA-xx and 1760-L12BWB-xx 1-5
  1760-L12BWB and 1760-L12BWB-NC 1-4
  1760-L18AWA 1-9
  1760-OW2 1-9
Rockwell Automation provides technical information on the web to assist you in using our products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

**Installation Assistance**

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States</strong></td>
<td>1.440.646.3223</td>
</tr>
<tr>
<td></td>
<td>Monday – Friday, 8am – 5pm EST</td>
</tr>
</tbody>
</table>

For additional assistance, contact our technical support teams:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outside United States</strong></td>
<td>Please contact your local Rockwell Automation representative for any technical support issues.</td>
</tr>
</tbody>
</table>

**New Product Satisfaction Return**

Rockwell tests all of our products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States</strong></td>
<td>Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.</td>
</tr>
</tbody>
</table>

For additional assistance, contact our technical support teams:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outside United States</strong></td>
<td>Please contact your local Rockwell Automation representative for return procedure.</td>
</tr>
</tbody>
</table>