

# Index

---

## A

Accumulator  
  load and output instructions, 11-25  
  logic instructions, 11-30  
  operations, 9-10-9-13  
  shifting bits in, 11-42

Adding Numbers, 11-34

Agency Approvals, 2-7

Aliases, 8-25

Auxiliary Functions, 3-17

## B

Bases  
  expansion, 4-14  
  I/O supported, 4-8  
  installation spacing, 2-4  
  installing modules, 2-10  
  local, 4-14  
  mounting dimensions, 2-10, 4-8  
  power budget, 4-26-4-31  
  power specifications, 2-6  
  power supply schematics, 4-11  
  power wiring, 2-11  
  run relay, 4-12  
  setting base jumpers, 4-16  
  setting switches, 4-16  
  specifications, 4-10-4-13

Battery, replacement, 3-14, 13-2

Baud Rate, 3-12

Bit Operation Instructions, 11-42

Boolean Instructions, 9-3, 11-4-11-18

## C

Communication, instructions, 11-52

Communication Port  
  data format, 3-13  
  DL340, 3-12  
  DL340 port diagrams, 3-13  
  master / slave selection, 3-13  
  response delay time, 3-13

Comparative Boolean Instructions, 11-19-11-21  
  in stages, 10-18, 12-12-12-19

Configuration, I/O examples, 4-17-4-25

Control Relays, 8-21

Converting Number Formats, 11-44-11-49

Counters, 8-22, 9-9, 11-23  
  in stages, 10-15, 12-19

CPU  
  auxiliary functions, 3-17  
  battery, 3-14  
  clearing memory, 3-21  
  features, 3-2  
  indicators, 13-3-13-6  
  memory options, 3-5  
  mode setting, 8-4  
  modes of operation, 3-20, 8-6-8-8  
  operating system, 8-3  
  scan time, 8-16  
  setup  
    DL330/DL340P, 3-9  
    DL340, 3-10  
    DL340 network address, 3-12  
  setup and system functions, 3-16  
  specifications, 3-3  
  switches  
    DL330/DL330P, 3-9  
    DL340, 3-10-3-13

## D

- Data Instructions, 9-12-9-47
  - in stages, 10-17
- Data Registers, 8-23
- Derating Characteristics, 5-10
- Dimensions, 2-7
- Discrete Input
  - specifications, 6-4-6-15
  - terminology, 6-2
- Discrete Memory, 8-19
- Discrete Output
  - specifications, 7-6-7-20
  - terminology, 7-2
- Dividing Numbers, 11-40

## E

- EEPROM, 3-5
- Enclosures, selection, 2-7
- End Instruction, 9-3
- Environmental Specifications, 2-6
- Error Codes, B-2
- Execution Times, 8-18, C-2-C-9
- Expansion Bases, 4-14-4-15

## F

- Fault Messages, 11-56
- Flowchart Programming, 10-26
- Forcing I/O, 8-10
- Fuses
  - I/O protection, 5-12
  - power supply, 13-4

## G

- Grounding, 2-4

## I

- I/O Memory, 8-20
- I/O Modules
  - address switch (base), 4-16

- configuration history, 4-2
- derating, 5-10
- discrete input specifications, 6-4-6-15
- discrete output specifications, 7-6-7-20
- example configurations, 4-17-4-25
- fuse protection, 5-12-5-15
- installing, 4-13
- numbering, 4-2, 4-3
- placement, 4-4-4-6
- point requirements, 4-3
- power requirements, 4-27-4-29
- response time, 8-14
- selection considerations, 5-2
- sinking and sourcing circuits, 5-2
- solid state field devices, 5-9
- testing outputs, 13-8
- troubleshooting, 13-10
- update sequence, 8-8
- wiring guidelines, 2-12, 5-11

- Indicators, CPU, 13-3-13-6

- Input Modules
  - specifications, 6-4-6-15
  - wiring diagrams, 6-4-6-15

- Installation
  - base mounting dimensions, 2-10
  - base power wiring, 2-11
  - base wiring, 4-7-4-9
  - component dimensions, 2-7
  - DL330/DL330P setup, 3-9
  - DL340 setup, 3-10
  - grounding, 2-4
  - I/O modules, 4-13
  - I/O wiring guidelines, 2-12
  - installing modules, 2-10
  - local and expansion bases, 4-14
  - panel design specifications, 2-4
  - setting CPU switches, 3-9-3-12

- Instruction, execution times, 8-18, C-2-C-9

- Instruction Set, index, 11-3

- Instructions
  - accumulator load and output, 11-25
  - accumulator logic instructions, 11-30
  - bit operations, 11-42
  - boolean, 11-4-11-18
  - comparative boolean, 11-19-11-21
    - in stages, 12-12-12-19

- counters, 11-23
  - in stages, 12-19
- end placement, 9-3, 13-13
- initial stage, 12-3
- jump, 12-5
- math, 11-34
- messages (fault), 11-56
- network communication, 11-52
- not jump, 12-5
- number conversion, 11-44
- program control, 11-50
- RLL<sup>PLUS</sup>, 12-2
- shift registers, 11-24
  - in stages, 12-21
- stage, 12-3
- timers, 11-22
  - in stages, 12-18

## J

- Jump Instruction, 12-5
- Jumpers, on bases, 4-16

## L

- Latching Outputs, in stages, 10-14
- Local Bases, 4-14

## M

- Maintenance
  - battery replacement, 13-2
  - guidelines, 13-2
- Master Control Relays, 11-50
- Math Instructions, 11-34
- Memory
  - battery backup, 3-14
  - clearing, 3-21
  - external storage, 3-4-3-6
  - initialization, 8-5
  - maps, 8-19, 8-25-8-40
  - options for CPUs, 3-4-3-6
  - PROM Writer Unit, 3-6
  - retentive, 3-4, 3-11, 8-5
  - retentive selection switch, 3-9
  - volatile and non-volatile, 3-4
- Messages, 11-56
- Multiplying Numbers, 11-38

## N

- Network Address, 3-12, 3-13
- Network Instructions, 11-52
- Noise, reducing problems, 13-11
- Not Jump Instruction, 12-5
- Number Conversion Instructions, 11-44

## O

- Output Modules
  - specifications, 7-6-7-20
  - using outputs in stages, 10-12
  - wiring diagrams, 7-6-7-20

## P

- Pause Relay, 13-13
- Power Budget, 4-26-4-31
  - worksheet, 4-31
- Power Specifications, 2-6
- Power Supply
  - schematics, 4-11
  - wiring, 4-9-4-12
- Program Control Instructions, 11-50
- Program Mode, 8-6
- Programming
  - accumulator usage, 9-10-9-12
  - basic concepts, 9-2
  - counters, 9-9
  - device connections, 3-18
  - flowchart style, 10-26
  - instruction set index, 11-3
  - RLL<sup>PLUS</sup> concepts, 10-2-10-37
  - stack operation, 9-6
  - timers, 9-8
  - troubleshooting, 13-12
- PROM Writer Unit, 3-6

## Q

- Quick Start, A-2-A-7

## R

- RAM, 3-5
- Retentive Memory, 3-4, 3-11
  - initialization of, 8-5
  - selection switch, 3-9
- Run Mode, 8-7
- Run Relay, 4-12

## S

### Safety

- fuses, 5-12
- guidelines, 2-2
- levels of protection, 2-2
- panel design specifications, 2-4
- planning for, 2-2
- sources of assistance, 2-2

### Scan Time, 8-16

### Shift Registers, 8-24, 11-24

- in stages, 12-21

### Shifting Accumulator Bits, 11-42

### Sinking Circuits, 5-2

### Sourcing Circuits, 5-2

### Special Registers, 8-24

### Special Relays, 8-24

- using the pause relay, 13-13

### Specifications

- base power, 2-6
- CPU, 3-3
- discrete input modules, 6-4-6-15
- discrete output modules, 7-6-7-20
- environmental, 2-6
- panel design, 2-4
- power source, 2-6

### Stages, 8-23

- activating, 10-8
- activating with power flow, 10-11
- execution rules, 10-7
- flowchart view, 10-26
- instructions, 12-3
- numbering, 10-6
- parallel branching concepts, 10-19
- resetting stages, 12-11
- setting, 10-10
- setting stages, 12-11
- unusual operations, 10-24
- using bits as contacts, 10-22, 12-7-12-10
- using comparative boolean in, 10-18
- using data instructions in, 10-17
- using initial, 10-8
- using outputs in, 10-12
- using to latch outputs, 10-14
- using with jump instructions, 10-9

### Storing Programs, 3-4-3-8

### Subtracting Numbers, 11-36

### Switches, CPU

- DL330/DL330P, 3-9
- DL340, 3-10

### DL340 communication, 3-12

### System

- component dimensions, 2-7
- components, 1-4
- enclosures, 2-7
- environmental specifications, 2-6
- operation, 8-2-8-37
- panel design specifications, 2-4
- power supply requirements, 2-6

## T

### Terminology

- discrete input, 6-2
- discrete output, 7-2

### Timers, 8-22, 9-8, 11-22

- in stages, 10-15, 12-18

### Troubleshooting

- See also* Indicators
- I/O modules, 13-10
- noise problems, 13-11
- programs, 13-12
- testing outputs, 13-8

## U

### UVPROM, 3-5

- comparing to the CPU, 3-8
- copying CPU program to, 3-7
- erasing, 3-8
- installing in CPU, 3-9, 3-10
- loading program to CPU, 3-8

## W

### Weights, D-2

### Wiring

- base power, 2-11
- bases, 4-7-4-9
- I/O guidelines, 5-11
- I/O modules, 2-12
- run relay, 4-12

### Word Memory, 8-19