# Autotech Controls
# M1950 $I^2 \cdot$ PLS
# Output Module
## Instruction & Operation Manual

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# PLS Module Introduction

Autotech's $I^2 \bullet$ PLS™ "integrates with intelligence" to provide an incredibly powerful functional unit which has the capacity for 80 PLS outputs.

## Most Advanced 80 Channel PLS

- LCD User Interface
- 100 Programs
- 100-280 microsecond scan time
- Optical I/O isolation
- Short-circuit proof resolver with broken wire detection and self diagnostics

The $I^2 \bullet$ PLS with its 2 line by 20 character LCD display sets a new milestone for user interface. All programming is menu driven with simple English messages. In addition, a bright 4-digit LED display is used to display position, RPM and other most commonly used parameters.

A 20-key keypad provides "*hot keys*" to quickly access or program the $I^2 \bullet$ PLS while retaining Autotech's popular 5-key programming feature. In addition, the user is able to enter alphanumeric labels for some functions.

PLS, Die Protect, or Load Signature modules may be plugged into any of the five back panel slots.

# Specifications

## PLS Module Specifications

| | |
|---|---|
| Maximum number of Programs or setups | 100 |
| PLS Setpoints | 20 per program |
| | Max.10 for Channels 1-8 |
| | Max.10 for Channels 9-16 |
| Number of Output Channels | 16, multiple dwells |
| Scale Factor | Desired counts per turn minus one. Programmable from 16 to 999, common to all PLS programs (Resolution:17 to 1000 counts / turn) |
| Offset | Programmable from 0 to Scale Factor Value, common to all PLS programs |
| Speed Compensation | Programmable for first 8 channels; each program has its own speed compensation |
| Scan Time | Microseconds for all 16 channels |
| Digital Outputs | P or N Type (Factory ordered) |
| **N-TYPE:** | |
| Logic True: | Transistor ON, 1.0 V @ 100 mA |
| Logic False: | Transistor OFF, 0.2 mA leakage @ 50V |
| N-type transistor outputs | Use with Autotech or similar relay output chassis |
| **P-TYPE:** | |
| Logic True: | Transistor ON, 1.7 V @ 100 mA |
| Logic False: | Transistor OFF, .02 mA leakage @ 250V |
| P-type transistor outputs | Use with Autotech or similar relay output chassis |

# Key Sequences

☞ **IMPORTANT NOTE:**
The GRAY KEYS, PLS and Die Protect, are "hot keys" which may be pressed to access either mode at any time.

| General Key Sequences | |
|---|---|
| **Key Pressed** | **Response** |
| RIGHT OR LEFT ARROW keys | • Moves the cursor from one choice to another. (The active field will be blinking.) |
| ENTER key | • Saves the selection |
| Up and Down Arrow Key or Numerical Keys (For Numerical values: user must ENTER to save) | • Increments or decrements values |
| MODE key | • Steps through the module modes |

# PLS Module Program Access

Pressing the PLS key will access the Edit Menu Display. If multiple PLS modules are installed, the user selects which module he wishes to edit. An example of this display is shown below:

```
1      2      3       4      5
PLS    PLS    DPS     TON
```

# PLS Operation

## PLS Modes

This section explains editing PLS parameters. Refer to the M1950 Base Unit Manual for Change, Edit, and Setup Program Menu Programming.

To program the PLS, move the blinking cursor in the Module display to "PLS" and press the **ENTER** key

to program the PLS setup information.

```
PLS    PLS    DPS     TON
 1      2      3       4      5
```

(Example Display only. Modules will vary.)

☞ This Mode may also be reached through the FRONT PANEL PLS KEY:
• Press the front panel PLS key once. If only one PLS module is installed, the display will go directly to the Channel Status display (shown in the next display of this manual).
• If more than one PLS module is installed, the display will go the the Change, Edit, Setup Display.

## PLS1 — Channel Status Display

The channel status display allows the operator to view the ON or OFF status of the 16 channels. All sixteen channels are viewable by pressing the **RIGHT ARROW** key. The channels are viewed four at a time: 1 to 4, 5 to 8, 9 to 12, and 13 through 16. Further pressing of the right arrow key will scroll through all 16 channels and return to to channel 1.

```
CH= 01      02      03      04
ST= OFF     ON      OFF     ON
```

## PLS2 — Dwell

A **DWELL** is composed of "ON" and corresponding "OFF" setpoints. (ON and OFF refer to the channel output status.) Setpoints are the shaft positions (angles) at which a channel is turned "ON" or "OFF".

```
CH 01      On=32      Of=92
   D1 New  On=32      Of=92
```

It is advisable to write the setpoint values down as they are entered.

Move through the DWELL display by using the right **ARROW** key. Press MODE to move to the next display.

CH: Select the Channel number by using the **numeric** or **UP or DOWN ARROW** keys. The current values of the setpoints are viewed on the top row and are not programmable.

D1 : For each channel, there may be eight dwell setpoints selected. The consecutively numbered dwells are accessible after each dwell is programmed by pressing the **UP ARROW** key to the next dwell number.

New ON/OF: Use the numeric or UP or DOWN ARROW key to change the values. Use the RIGHT ARROW key to move as follows:

ON SETPOINT
FIRST PRESS of the RIGHT ARROW KEY after the Dwell number moves the blinking cursor to the ON setpoint. Use the numeric key or the UP or DOWN arrow key to change the value.

OFF SETPOINT
**SECOND PRESS** of the RIGHT ARROW KEY moves the blinking cursor to the OFF setpoint for programming. Use the numeric key or the UP or DOWN arrow key to change the value.

---

NOTE: PRESS ENTER to SAVE the Setpoints
OR

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PRESS the RIGHT ARROW KEY a third time to cause **BOTH** the **ON and OFF setpoints** to be changed at the same time (while retaining the span of dwell relationship). An example of dwell spans is shown below. Note the relationship in this example shows a span of 100 being retained.

☞ Numeric entry is not allowed in this case, only the use of the UP and DOWN arrow keys may be used.

| Old/New Setpoint ON | Old/New Setpoint OFF | SAME SPAN Retained |
|---|---|---|
| 80 | 180 | 100 |
| 200 | 300 | 100 |
| 30 | 130 | 100 |

☞ All Dwells on one channel will be cleared when the ON and OFF Setpoints are programmed with the same value.

## PLS3 — Speed Compensation

```
CH 01          Speed Comp.
  Old =10        New =47
```

Speed Compensation is a degree advancement per 100 RPM which is programmable for each of the first eight channels.

The value entered is the angle of offset to be added per each 100 RPM.

The speed compensation value in the display above would add 47 degrees to the actual position of the shaft for each 100 RPM of speed for channel one. (Actual Shaft Speed = RPM $+47^{\circ}/100$ RPM)

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# How to Order

ASY-M1950-16X . . . . PLS Output Module - 16 Channel
**Where x =**
  P       PNP Sourcing Outputs
  N       NPN Sinking Outputs