

### *Description of Option:*

This option allows the iPLC-1 Controller to function as a stand-alone controller in high speed press applications. The additional features of the iPLC with this option are:

- Expanded number of programs from 4 to 60.
- Three Die Protection Inputs. (Inputs 1 - 3)
- Two Latching Inputs. (Inputs 4 -5)
- Brake Monitor Function. (Clutch Input on Input 6)
- Mode Select Inputs to control access to programmable features. (Inputs 7-8)
- Three Part and Batch Counters.
- Twelve Limit Outputs to control press functions.

Outputs 1-8 can be Auto Advanced for applications that require speed compensation.

When programmed as an Advanced Limits, the limit will turn on and off before its programmed Setpoints so that the load will mechanically activate at the programmed points.

Outputs 9-12 can be programmed as Position ON, Time OFF Limits (Time out timers).

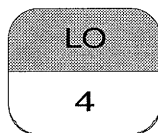
- Die Protection Fault Output. (LS13)
- Batch Counter Limit Output. (LS14)
- Redundant Fault Outputs. (LS15 & LS16)

Repeat Setpoint programming is not available with this option.

### *Keyboard Changes and Additions*



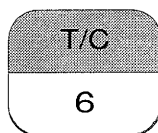
This key is still used to enter and exit program mode, but 60 programs are available instead of the standard four.



In addition to displaying the status of the 12 Limit Outputs, this key displays the status of Inputs 1 through 6. A fault on an input is shown by replacing the input number with an asterisk "\*". The input status must be showing on the display before a fault can be cleared.



Repeat Setpoint Programming is not available with the iPLC-1-32. This key is instead used to program the three Die Protection Limits. If a Positive or Negative Transition does not occur on the associated input within the programmed window, a Die Protection Fault will occur.

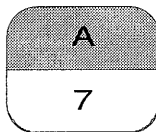


This key is dual purpose. When programming Limits 9 -12, pressing this key will change the limit from a Position ON / Position OFF Limit to a Position ON / Time OFF Limit where the OFF Setpoint is the on time in milliseconds. When used by itself, this key programs or inspects the three part and batch counters. Counter 1 counts the total number of press strokes, Counter 2 counts the number of press strokes in the present batch, and Counter 3 counts the number of batches made. The Batch Counter, Counter 2, has a programmable limit of 1 to 99,999 parts.

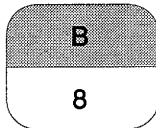
## Additional Instructions: iPLC-1-32

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### Keyboard Changes and Additions (cont'd)



This key is dual purpose. When used by itself, this key programs the Auto Advance time in milliseconds. When programming Limits 1-8, pressing this key will add the Auto Advance feature to the limit.



Use this key to display the stopping time of the press. Minimum stopping time is 30 mSec, which is the delay time of the AC Input Relay. Maximum stopping time is 9.999 seconds. This key is also used to program the acceptable stopping time of the press once the Brake Input (Input 6) is activated. Acceptable stopping time is programmed in milliseconds with a maximum of 999 milliseconds.

### Programming Changes and Additions

Except for the examples below, programming a iPLC-1-32 is identical to programming a standard iPLC Controller.

Repeat setpoint programming is not available with the iPLC-1-32. Section 12.15 of the iPLC Manual does not apply to the iPLC-1-32 Controller.

In all of the following examples, the iPLC-1-32 Controller must be in Program Mode. Refer to Sections 12.1 or Section 12.3 of the iPLC Manual.

### Die Protection

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The iPLC-1-32 has three die protection inputs. If an input transition does not occur within the programmed window, there is a fault. Outputs LS13, LS15, and LS16 will de-energize. Your application requires the following die protection windows.

Die Protection Input 1: 185 - 200

Die Protection Input 2: 265 - 283

Die Protection Input 3: 330 - 015

PRESS	DISPLAY	COMMENTS
[REPEAT]	"D1 - _ _ _ - _ _"	Window for Input 1. No Setpoints in memory. Input disabled.
[1,8,5], [►], [2,0,0], [ENTER]	"D1 - 185 - 200"	Window for Input 1.
[NEXT]	"D2 - _ _ _ - _ _"	Window for Input 2. No Setpoints in memory. Input disabled.
[2,6,5], [►], [2,8,3], [ENTER]	"D2 - 265 - 283"	Window for Input 2.
[NEXT]	"D3 - _ _ _ - _ _"	Window for Input 3. No Setpoints in memory. Input disabled.
[3,3,0], [►], [0,1,5], [ENTER]	"D3 - 330 - 015"	Window for Input 3.

**Programming Changes and Additions (cont'd)****Auto Advances**

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Limit 5 is used to control a solenoid that has a 10 mSec delay between electrical and mechanical activation. You want to Advance Limit 5 by 10 mSec to compensate for this delay.

PRESS	DISPLAY	COMMENTS
[A]	"DELAY 000"	Default Delay time of 0 mSec.
[0,1,0], [ENTER]	"DELAY 010"	Program Delay of 10 mSec.
[LS], [0,5], [ENTER]	"05-100-150"	Programmed Setpoints on Limit 5.
[FUNCTION], [A], [ENTER]	"05-100^150"	"^" indicates that the Limit is now an Advanced Limit.

**Time Out Limits**

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You want to use Limit 9 as a Time Out timer output. The limit to turn on at 200 and turn off after 230 mSec.

PRESS	DISPLAY	COMMENTS
[LS], [0,9], [ENTER]	"09- _ _ - _ _"	No Setpoints programmed on Limit 9.
[2,0,0], [▶], [2,3,0]	"09-200-230"	Limit Setpoints.
[FUNCTION], [T/C], [ENTER]	"09-200<230"	"<" indicates that the Limit is now a Time Out Limit.

**Part and Batch Counters**

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You want to program the press to shut off after a batch of 5000 pieces.

PRESS	DISPLAY	COMMENTS
[T/C]	"C,1 000000"	Number of press strokes since power up.
[T/C]	"C,2 00000"	Number of press strokes in present batch since power up.
[T/C]	"C,3 00000"	Number of batches run since power up.
[T/C], [0,5], [ENTER]	"C2,L, 05000"	Number of press strokes per batch. When exceeded, Output LS14 will de-energize.

The values of the three counters are not stored on power down. The number of strokes per batch is stored. Counters 1 and 2 increment as the position passes through the zero point in either direction. These counters are not intelligent. If a press cycle has a fault, the counters will still increment if the position passes through zero.
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## Additional Instructions: iPLC-1-32

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### Programming Changes and Additions (cont'd)

#### Brake Monitor

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You want a maximum stop time of 125 mSec on your press.

PRESS	DISPLAY	COMMENTS
[B]	"S,TIME 0.000"	Default on power up. Displays stop time on every cycle. Mim. time of 30 mSec.
[B], [1,2,5], [ENTER]	"ST,LIM 125"	Programmed stop time limit. If stop time is exceeded, outputs LS15 & LS16 will de-energize.

### Fault Clearing

The Redundant Fault Outputs (LS 15 & LS16) will de-energize due to one or more of five types of faults.

- iPLC-1-32 experiences a power failure. Outputs will re-energize when power is re-applied.
- Transducer fault.
- Die Protection fault on any of the three channels. This fault also de-energizes LS13.
- Stop Time fault.
- Either Auxiliary Latching Input (Input 4 or 5) is energized.

The Auxiliary Latching Inputs are typically used for such applications as Material Buckle or End of Stock detection. The state of the inputs is sensed by the iPLC-1-32 which then controls the outputs. Because the Auxiliary Latching Inputs do not directly control power to the press, they must not be used as Emergency Stop Inputs or in any application that safeguards the press operator.

A transducer fault is cleared by following the procedure in Section 13.1 of the iPLC User's Manual. The remaining three types of faults are cleared by displaying their status with the [LO] Key.

In the following example, there is a Die Protection fault on Input 2.

PRESS	DISPLAY	COMMENTS
[LO]	"01, _ _ _ ++ _ _ _"	Output Status LS1 to LS8. "_" = OFF, "+" = ON
[LO]	"09, + _ + _ _ + _ _"	Output Status LS9 to LS16. "_" = OFF, "+" = ON
[LO]	"IN, 1*3-45-6"	Input Status. "*" = Error on Input.
[CLEAR]	"IN, 123-45-6"	Error on Die Protection 2 cleared.

### *Fault Clearing (cont'd)*

When the number of press cycles is reached, Output LS14 de-energizes. This output can be wired in series with the Redundant Fault Outputs to stop the press when the batch has been completed. The following keystrokes re-energizes LS14 once the operator is ready to start the next batch.

PRESS	DISPLAY	COMMENTS
[T/C]	"C,1 005000"	Number of press strokes since power up.
[T/C]	"C,2 00000"	Number of press strokes in present batch since power up.
[CLEAR]	"C,2 00000"	Output LS14 re-energized.

### *Mode Select Inputs*

Inputs 7 and 8 control access to the iPLC-1-32 programs. These inputs are typically connected to a key switch to prevent operators from changing some or all of the iPLC-1-32's programming.

Input 8	Input 7	Comments
De-energized	De-energized	Enables all programming if P.CODE is known. All Faults can be cleared.
De-energized	Energized	Same as above except: Only LS5 - LS12, Counter 2 Limit, and the Die Protection Windows can be programmed. Program cannot be cleared
Energized	De-energized	Same as above except: Program Mode cannot be entered. Only Counter 2 Limit can be modified. Auxiliary Latching Input faults can be cleared if they are the only fault on the press. All other faults cannot be cleared.
Energized	Energized	Same as above except: Program Number cannot be changed.

### *Hardware Connections*

An input is energized when it is connected to a voltage source between 3 and 15 Vdc.

An input is de-energized when it is floating (no connection) or connected to a voltage source between 0 and 1 Vdc.

Isolation Relays should be used between the Controller and the external circuitry that activates the inputs. This will prevent Ground Loops in the system and protect the iPLC-1-32 if any high voltages are applied.

## Additional Instructions: iPLC-1-32

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### Hardware Connections (cont'd)

An internal +12 Vdc supply that can be used to energize the inputs is available under the following conditions:

- The iPLC-1-32 must have Sinking or TTL compatible Outputs. Sourcing Output Controllers do not have an internal 12 volt supply.
- An IM-1 Interface Module, IRB-1 Input Relay Board, or RB-1 Solid State Output Relay board must be used in the system.

All other system configurations require an external supply with an output voltage between 5 and 15 Vdc. (12 Vdc supply recommended.)

The following table lists the pinout assignments of the input pins and voltage sources.

	J1 Conn.	IM-1	RB-1	MRB-1
Input 1	Pin 3	Pin 3	Pin 1 - TB7	Pin 1 - TB8
Input 2	Pin 1	Pin 1	Pin 2 - TB7	Pin 2 - TB8
Input 3	Pin 2	Pin 2	Pin 3 - TB7	Pin 3 - TB8
Input 4	Pin 4	Pin 4	Pin 4 - TB7	Pin 4 - TB8
Input 5	Pin 12	Pin 12	Pin 5 - TB7	Pin 5 - TB8
Input 6	Pin 10	Pin 10	Pin 6 - TB7	Pin 6 - TB8
Input 7	Pin 8	Pin 8	Pin 7 - TB7	Pin 7 - TB8
Input 8	Pin 6	Pin 6	Pin 8 - TB7	Pin 8 - TB8
GND	Pin 16	Pin 16	Pin 9 - TB7	Pin 9 - TB8
+ 12Vdc	Pin 14	Pin 14	Pin 10 - TB7	External Pin 10 - TB8