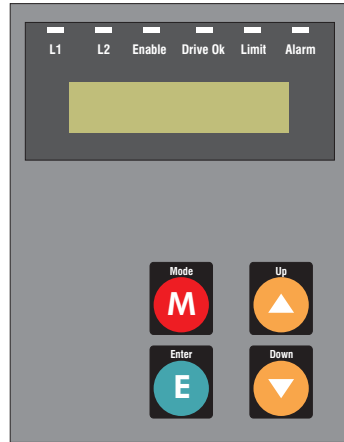


Chapter 8 - Keypad Operation

8.1 Keypad Description

The keypad is made up of:



<-- six LEDs

<-- an LCD display with two 16 digits lines

<-- four function keys.

8.1.1 LED

The meaning of the LEDs can be summarized as follows :

- **L1,L2 (yellow)** These LEDs are controlled by MDPlc application for general purpose. During normal operation, these LEDs will be OFF.
- **Enable (green)** This LED is ON when the drive is power supplied and enabled.
- **Drive Ok (green)** This LED is ON when the drive is powered and there are no fault conditions.
- **Limit (yellow)** This LED will turn ON if the drive goes into current limit condition. During normal operation this LED will be OFF.
- **Alarm (red)** This LED starts to blink in case of a fault condition of the drive. During normal operation this LED will be OFF.

8.1.2 Display

The display has two modes: normal **Start-up** mode, and **Parameters** mode.

In **Start-up** mode, two fields are displayed:

- **n** Motor actual speed (rpm)
- **I** Motor actual current (Arms)

In the **Parameters** mode, three different fields are shown:

- **MENU** In this field is displayed the index of the menu actually displayed (E.g.. 001 = Monitor menu).
- **IPA** In this field there is displayed the index of the Parameter actually displayed (E.g.. 18743 = SYS_SPEED).
- **VALUE** In this field there is displayed the actual value of the selected parameter. There are four parameter formats : integer, hexadecimal, decimal, exponential.

8.1.3 Function Keys

The keypad is provided with four function keys that will have different meanings depending on the keypad status.

- **UP, DOWN keys**

These two keys are used to change the value of the selected display field.

If the MENU field is selected, with these two keys the operator will be able to select the MENU that he would like to display.

If the IPA field is selected, the operator will be able to select the IPA , within the specified MENU, that he would like to monitor or to modify.

If the VALUE field is selected, the operator will be able to modify the value of the actual digit (from 0 to 9 and all other permitted characters).

- **ENTER key**

If the MENU or the IPA fields are selected, this key will allow the modification of the parameter actually displayed.

If the VALUE field is selected, this key will confirm the value of the actual digit and will move the cursor to the next digit.

If the last digit of a parameter is selected, this key will confirm the value of the parameter.

- **MODE key**

If the MENU field is selected, this key will select the IPA field.

If the IPA field is selected, this key will select the MENU field.

If the VALUE field is selected, this key will abort the parameter modification and will move back to the IPA field.

8.1.4 Using the Keypad

At drive power on, the display will momentarily show drive configuration (Basic or Plc) and the firmware version:

PXBasic Sync FW V 3.20

After few seconds the display will shown the speed (n, in rpm) and the load (I, in amps).

n	1500.0
I	3.0

Pushing M (Menu) will change the display to the parameter mode, showing the Menu number and the parameter number on the first line and the value of the parameter on the second line.

! M001	P20053
*	10612

!=Only if alarm active , *=read only parameter.

Pushing M (Menu) will result in highlighting the “M”. Using the UP and DOWN keys will change the menu number. Pushing M (Menu) again will result in the highlight moving to the “P”. Using the UP and DOWN keys will change the parameter number. Pushing E (Enter) will highlight the rightmost number of the parameter, use the UP and DOWN keys to set it and push E (Enter), this will move the cursor to the next position, etc. When all the digits have been entered, the next push of the E (Enter) will put the new value in ACTIVE memory only. If the value is to be saved in permanent memory, push M (Menu) until “P” is highlighted, then push M again to display an “S” in the left side of the second line. Depress Enter to save the parameter to permanent memory.

Parameter values may be monitored only if the flashing highlight cursor is not visible.

8.2 Keypad Operations

Status description	Display description	Function keys		
		ENTER	MODE	UP/DOWN
Keypad startup	Actual speed and actual current	Move to "Parameter display"	Move to "Parameter display"	Move to "Parameter display"
Parameter display	The MENU, IPA and VALUE field are displayed; the parameter value is continuously updated	Move to "Parameter modification"	Move to "MENU selection"	Move to "Keypad startup"
MENU selection	The cursor position is in the MENU field; the MENU can be selected using the UP/DOWN keys.	Move to "Parameter modification"	Move to "IPA selection"	Selection of the actual displayed MENU; on the display it will be showed the first IPA of the selected MENU and its current VALUE.
IPA selection	The cursor position is within the IPA field; the IPA can be selected using the UP/DOWN keys.	Move to "Parameter modification"	Move to "Save parameters"	Selection of the actual displayed IPA; the VALUE showed will be the one of the actually selected IPA.
Parameter modification	The cursor is blinking on the digit actually selected of the VALUE field. The digit value can be modified using the UP/DOWN keys.	Confirm the value of the actual digit and move to next digit. To exit the parameter modification the operator must press ENTER when the cursor is blinking on an empty digit. After this the keypad will move to "Parameter Display"	Abort the parameter modification and move to "Parameter Display"	Selection of digit value of the currently selected Parameter digit (from "0" to "9", "E", " ", "-", ",")
Save parameters	The display will show an "s" in the second line.	Save parameters and move to "Parameter display"	Abort parameter modification and move to "Parameter display"	Abort parameter modification and move to "Parameter display"
Load default parameters	Select IPA 18107 (210-Service menu)	Move to "Parameter modification"		Select value 1 and press ENTER. An alarm occurs. Move to "Save parameters" status and then move to "Reset drive" status.
Reset Alarm	See chapter 8.3.1, Alarm			
Reset Drive	See chapter 8.3.1, Alarm			

8.2.1 Errors

If the operator tries to enter to a parameter a wrong value (e.g. outside the Min/Max permitted values), the display will show an "E" followed by the numeric code of the error (e.g. E006); to move back to Status Index 2 "Parameter Display" press any function key of the keypad.

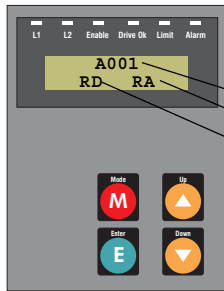
Table 8.3.2.1: Errors list

Code E001	Error code 1	Parameter does not exist
Code E002	Error code 2	System error
Code E003	Error code 3	Type does not exist
Code E004	Error code 4	Read-only parameter
Code E005	Error code 5	Write enabled only when drive is enabled
Code E006	Error code 6	Value outside min value
Code E007	Error code 7	Value outside max value
Code E008	Error code 8	System error
Code E009	Error code 9	Value exceed limit

8.3 Alarms and Errors Handling

8.3.1 Alarms (Failure register)

Figure 8.3.1: Led Status and Keypad



In case an alarm occurs, **ALARM** led is lighed up with an intermitten red colour and an error code will be displayed.

A001 = Alarm code
 RA = Alarm Reset
 RD = Drive Reset

In case an alarm occurs, the LED at the top-right is illuminated red. In such a case the alarm code is shown on the keypad display : an "A" followed by the numeric code of the actual alarm (e.g. A026).

If the code is not displayed, press ENTER to see the code. To clear the alarm, turn off the drive enable and press ENTER on RA (Reset Alarm) writing.

To reset the drive turn off the drive enable and press ENTER on RD (Reset Drive) writing.

Table 8.3.1.1: Alarms list

Code A001	Alarm code 1	(*)	IGBT DESATURATION
Code A002	Alarm code 2	(*)	OVERCURRENT
Code A003	Alarm code 3	(*)	DC LINK OVERVOLTAGE
Code A004	Alarm code 4	(*)	HEATSINK OVERTEMP
Code A005	Alarm code 5		PAR SETTING ERROR
Code A006	Alarm code 6	(*)	CURRENT FEEDBACK LOSS
Code A007	Alarm code 7	(*)	MOTOR OVERTEMP
Code A008	Alarm code 8		CPU OVERTIME
Code A009	Alarm code 9		ENABLE KEY ERROR
Code A011	Alarm code 11		INVALID FLASH PARMS
Code A012	Alarm code 12		BAD FLASH DEVICE
Code A013	Alarm code 13	(*)	BRAKE OVERPOWER
Code A014	Alarm code 14	(*)	FAILURE POWER SUPPLY
Code A018	Alarm code 18	(*)	ENCODER FEEDBACK LOSS
Code A019	Alarm code 19	(*)	ENCODER SIMULATION
Code A020	Alarm code 20	(*)	UNDERVOLTAGE
Code A021	Alarm code 21	(*)	INTAKE AIR OVERTEMP
Code A022	Alarm code 22	(*)	REGULATION OVERTEMP
Code A023	Alarm code 23	(*)	MODULE OVERTEMP
Code A025	Alarm code 25		RESET REQUIRED
Code A026	Alarm code 26	(*)	FB BUS LOSS
Code A027	Alarm code 27	(*)	SEQUENCE ERROR
Code A028	Alarm code 28	(*)	FAST LINK ERROR
Code A029	Alarm code 29	(*)	POSITION ERROR
Code A030	Alarm code 30	(*)	DRIVE OVERLOAD
Code A031	Alarm code 31	(*)	EXTERNAL FAULT
Code A032	Alarm code 32		PLC APP NOT RUN

(*) alarms resettable with an ALARM RESET command

8.3.2 Alarm description

(A001) IGBT DESATURATION

Short circuit on the motor winding or on the power bridge.

(A002) OVERCURRENT

Overcurrent protection intervention.

The cause could be an incorrect setting of the current regulator gains as compared

(A003) DCLINK OVERVOLTAGE

Overvoltage on the intermediate circuit.

The braking resistance is not connected in the right way or it is open. The threshold is 950V.

(A004) HEATSINK OVERTEMP

Drive thermal protection.

The working cycle is too high for the drive size.

(A005) PAR SETTING ERROR

Parameters setting error.

The IPAs are showed on SYS_PAR_SET_IPA1 (IPA 24110) and SYS_PAR_SET_IPA2 (IPA 24111)

(A006) CURRENT FEEDBACK LOSS

Current feedback sensor failure.

(A007) MOTOR OVERTEMP

Intervention of the motor thermal protection.

Overtemperature on the motor winding or PTC sensor not connected to the drive.

(A008) CPU ERROR

On IPA 18143 the cause is specified.

(A009) ENABLE KEY ERROR

Wrong enabling key for Plc and/or DeviceNet.

(A011) INVALID FLASH PARMS

The parameter value is not recognized.

Do the Parameter Saving and Drive Reset commands with the correct parameters.

(A012) BAD FLASH DEVICE

Alarm on a non preset flash. Firmware error.

(A013) BRAKE OVERPOWER

The internal braking resistance is too warm because of a too high working cycle.

Wait 30 seconds and give the Drive Reset command. The resistance temperature is calculated by an algorithm of the drive.

(A014) FAILURE POWER SUPPLY

±15V internal power supply of regulation board R-XVy is not working.

(A018) ENCODER FEEDBACK LOSS

Error detected in encoder feedback. Failure cause is specified in parameter SYS_ENC_ALARM_WARNING_CAUSE, IPA 20016 (menu 190 ALARMS)

(A019) ENCODER SIMULATION

Encoder simulation alarm.
Check the encoder simulation parameters..

(A020) UNDERVOLTAGE

Always active when the drive is enabled.
The threshold level depends on the power supply level selected in parameter SYS_MAIN_VOLTAGE, IPA 20050, according to the following table.

Mains Voltage Setting	Undervoltage Threshold (DC link)
230 VAC	225.4 VDC
380 VAC	372.3 VDC
400 VAC	391.9 VDC
415 VAC	406.6 VDC
440 VAC	431.1 VDC
460 VAC	450.7 VDC

(A021) INTAKE AIR OVERTEMP

Temperature of intake air too high; detected by TAC sensor.

(A022) REGULATION OVERTEMP

Overtemperature of regulation board; detected by sensor on reg board.

(A023) MODULE OVERTEMP

IGBT module Overtemperature; detected by sensors on Power stage.

(A025) RESET REQUIRED

There has been a modification of one or more parameters that requires a DRIVE RESET to be active.

(A026) FB BUS LOSS

Bus communication not present

(A027) SEQUENCE ERROR

Sequence error alarm
When the drive is power supplied (after the drive reset), it is active if the digital input 0 is high.

(A028) FAST LINK ERROR

Fast Link communication alarm.
It occurs in slave drives when the fast link serial communication is physically interrupted.

(A029) POSITION ERROR

Position error alarm.
It happens in the position slaves and with the electric shaft mode when the error is higher than the "SYS_POS_ERROR_MAX" parameter (IPA18123).

(A030) DRIVE OVERLOAD

Drive overload alarm.

Drive overload duration is too high. Check drive sizing using the overload table specified in section (2.3.3 IxT algorithm)

(A031) EXTERNAL FAULT

External alarm present.

A digital input has been programmed as an external alarm, but +24V is not available on this terminal.

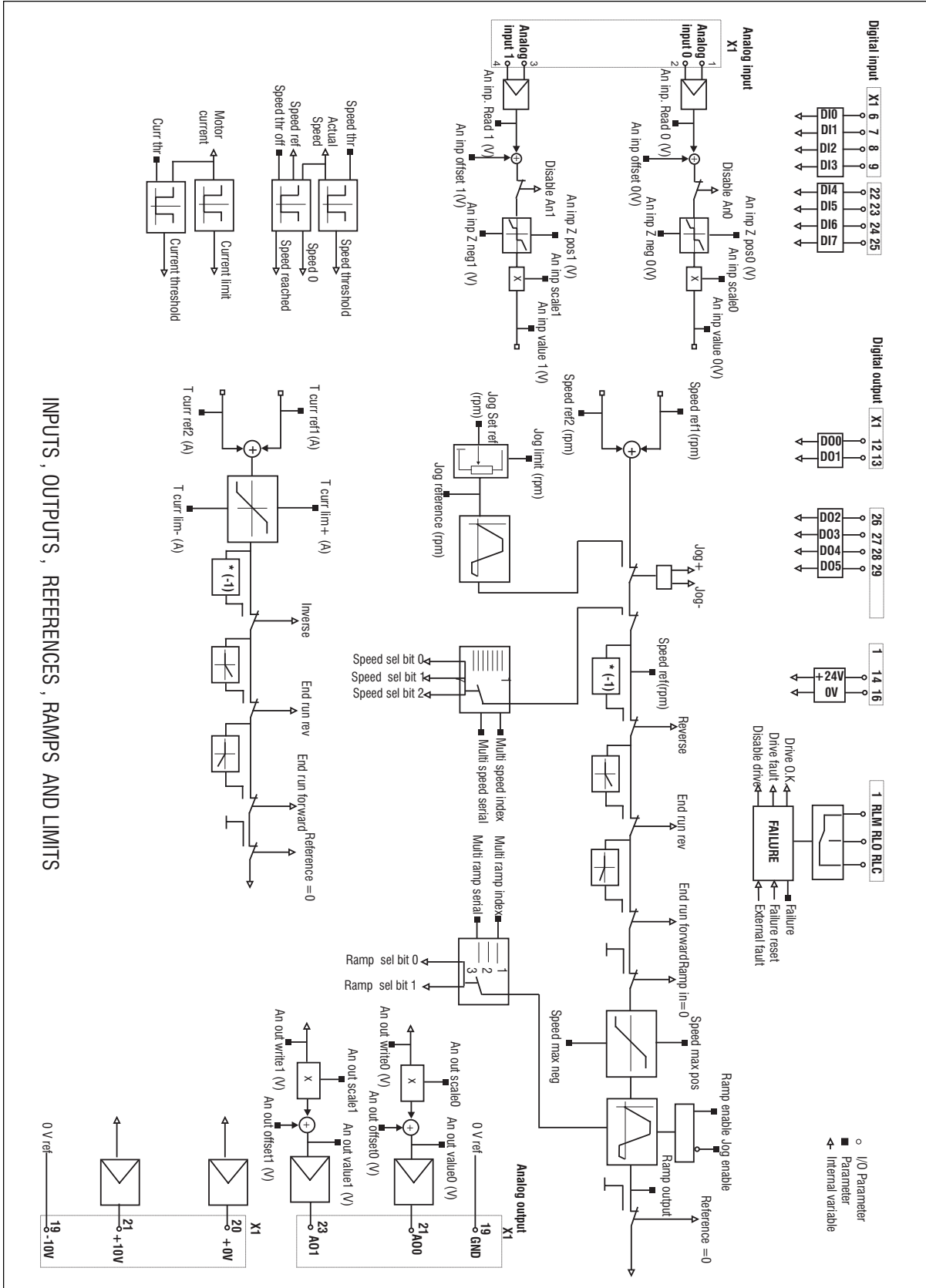
(A032) PLC APP NOT RUN

MDPlc application not loaded.

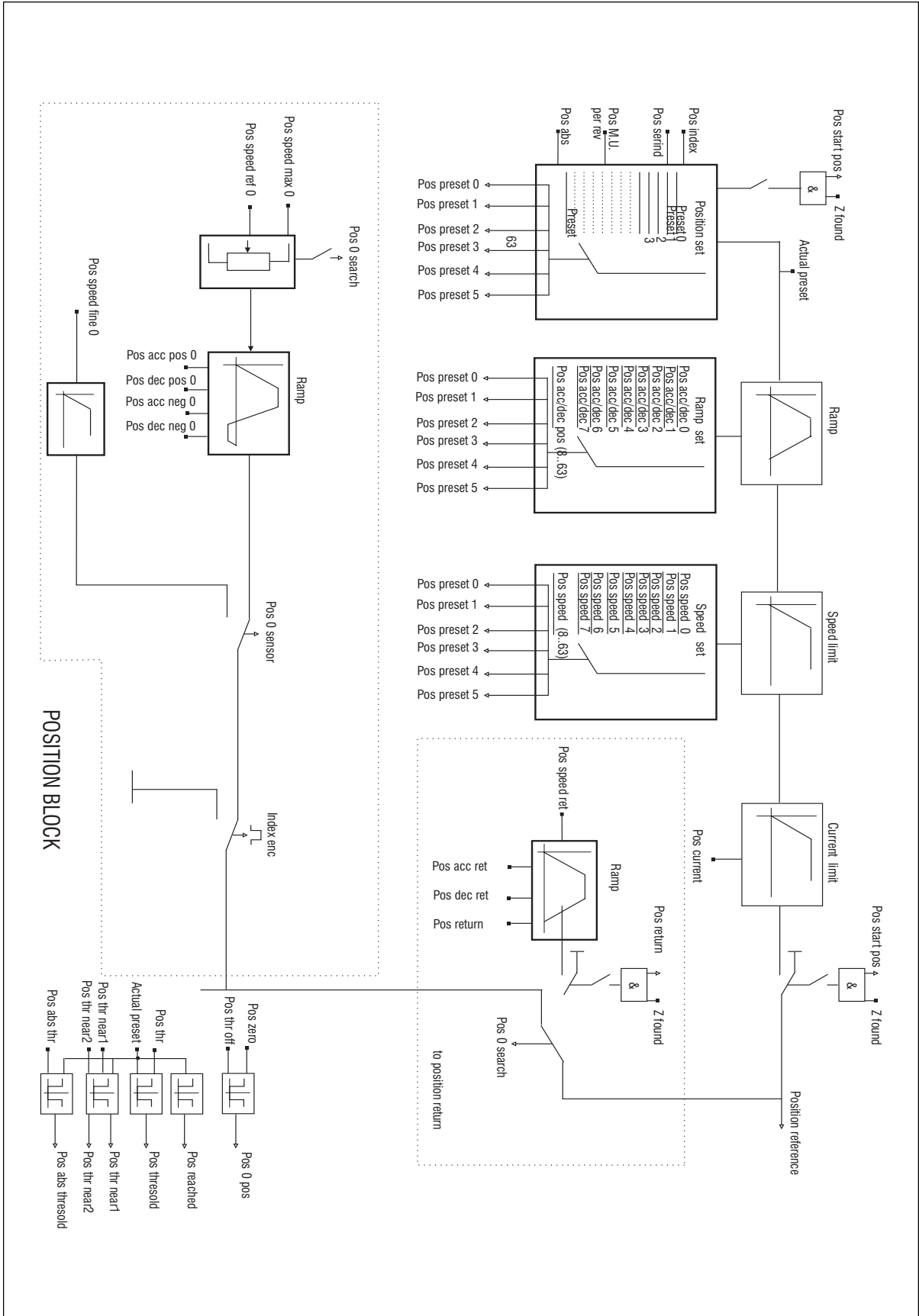
Active only if the application selected is MDPlc.

Notes:

Chapter 9 - Block Diagrams



INPUTS, OUTPUTS, REFERENCES, RAMPS AND LIMITS



Notes: