CONTROLLER INFORMATION SHEET

# Pacific Scientific PC830 Series Servo Controllers

## Overview

**Maple Systems' 3100 Series and 4100 Series Operator Interface Terminals** (Maple OITs) can be used to monitor and modify the operating parameters of Pacific Scientific's PC830 Series servo controllers. Below is a listing of the PC830 Series models which can communicate to a Maple OIT:

| Compatible Controllers | |
|---|---|
| **Controller Family** | **Controller Model** |
| PC830 Series | PC832, PC833, PC834 |

Maple Systems' OITware-200 configuration software allows a Maple OIT to communicate with a Pacific Scientific PC830 Series servo controller using the PC830 protocol. When configured with **OITware-200**, the **Maple OIT is the master** in a point-to-point single master, single slave or single master, multiple slave format.

## Communications Cable

The Maple OIT should be connected via 3-wire RS-232 or 4-wire RS-422 to the serial port on the Pacific Scientific PC830 controller.

Refer to Technical Note 1061 for information on communications cable part numbers and cable assembly instructions. If you will be assembling your own communications cable, cable assembly instructions are also available on our web site at www.maple-systems.com.

**WARNING:** If you communications cable is not wired exactly as shown in our cable assembly instructions, damage to the Maple OIT or loss of communications can result.

# Controller Settings

| Name | Setting | Options | Important Notes |
|---|---|---|---|
| Baud Rate: | 19200 | No options | Must match the OIT Configuration setting. Use the fastest baud rate supported by both. |
| Data Bits: | 8 | No options | Must match the OIT Configuration setting. |
| Parity: | None | No options | Must match the OIT Configuration setting. |
| Stop Bits: | 1 | No options | Must match the OIT Configuration setting. |
| Node Address: | 255 | 1 to 255 | Must match the OIT Configuration setting. The global node address, 255, should not be used in a network since all drives respond. |

# Accessible Controller Commands and Memory

### *Accessible Controller Commands and Memory*

The following tables list the Controller commands and memory ranges that Maple's OITs are able to access: (Please note that your Controller's memory range may be ***smaller*** or ***larger*** than that supported by Maple's OITs.)

### *For Register Monitors:*

| Keyword | Sub-Element | Access | Preferred Format |
|---|---|---|---|
| AccelLmt | N/A | R/W | Float |
| ActiveAccelRate | N/A | R | Float |
| ActiveDecelRate | N/A | R | Float |
| ActiveDistance | N/A | R | Long |
| ActiveDistOffset | N/A | R | Long |
| ActiveHomeDir | N/A | R | 1/0, On/Off, ASCII String |
| ActiveHomeMode | N/A | R | Decimal |
| ActiveMove | N/A | R/W | Decimal |
| ActiveMoveType | N/A | R | Decimal |
| ActiveRegSelect | N/A | R | 1/0, On/Off, ASCII String |
| ActiveRunSpeed | N/A | R | Float |
| ActualILmtMinus | N/A | R | Float |
| ActualILmtPlus | N/A | R | Float |
| ADF0 | N/A | R/W | Float |

| Keyword | Sub-Element | Access | Preferred Format |
|---|---|---|---|
| ADOffset | N/A | R/W | Float |
| AInNull | N/A | R/W | 1/0, On/Off, ASCII String |
| AnalogIn | N/A | R | Float |
| AnalogOutX | 1-2 | R/W | Float |
| ARFX | 0-1 | R/W | Float |
| AxisAddr | N/A | R/W | Decimal |
| Brake | N/A | R | 1/0, On/Off, ASCII String |
| CcwInh | N/A | R/W | 1/0, On/Off, ASCII String |
| CfgD | N/A | R | Decimal |
| CmdGain | N/A | R/W | Float |
| CmdGain2 | N/A | R/W | Float |
| CommSrc | N/A | R/W | Decimal |
| CwInh | N/A | R/W | 1/0, On/Off, ASCII String |
| DecelLmt | N/A | R/W | Float |
| DigitalCmd | N/A | R | Long |
| DigitalCmdFreq | N/A | R | Float |
| DMXF0 | 1-2 | R/W | Float |
| DMXGain | 1-2 | R/W | Float |
| DMXMap | 1-2 | R/W | Decimal |
| DMXOut | 1-2 | R | Float |
| DriveStatus | N/A | R | Decimal |
| ElecAngTau | N/A | R/W | Decimal |
| Enable | N/A | R/W | 1/0, On/Off, ASCII String |
| Enable2 | N/A | R/W | 1/0, On/Off, ASCII String |
| Enabled | N/A | R | 1/0, On/Off, ASCII String |
| EncAlignRampIcmd | N/A | R/W | Decimal |
| EncAlignTestDist | N/A | R/W | Decimal |
| EncAlignTime | N/A | R/W | Decimal |
| EncFreq | N/A | R | Float |
| EncIn | N/A | R/W | Decimal |
| EncInF0 | N/A | R/W | Float |
| EncMode | N/A | R/W | Decimal |

| Keyword | Sub-Element | Access | Preferred Format |
|---|---|---|---|
| EncOut | N/A | R/W | Decimal |
| EncPos | N/A | R | Long |
| ExtFault | N/A | R | Decimal |
| Fault | N/A | R | 1/0, On/Off, ASCII String |
| FaultCode | N/A | R | Decimal |
| FaultReset | N/A | R/W | 1/0, On/Off, ASCII String |
| FVelErr | N/A | R | Float |
| FwV | N/A | R | Decimal |
| GearingOn | N/A | R/W | 1/0, On/Off, ASCII String |
| HallOffset | N/A | R/W | Decimal |
| HallState | N/A | R | Decimal |
| HomeSwitch | N/A | R | 1/0, On/Off, ASCII String |
| HSTemp | N/A | R | Float |
| HwV | N/A | R | Decimal |
| ICmd | N/A | R | Float |
| IFB | N/A | R | Float |
| ILmtMinus | N/A | R/W | Decimal |
| ILmtPlus | N/A | R/W | Decimal |
| InpX | 1-6 | R | Long |
| InpMapX | 1-6 | R/W | Decimal |
| InPosLimit | N/A | R/W | Decimal |
| Inputs | N/A | R | Decimal |
| IntgStopThresh | N/A | R/W | Float |
| Ipeak | N/A | R | Float |
| ItF0 | N/A | R/W | Float |
| ItFilt | N/A | R | Float |
| ItThresh | N/A | R/W | Decimal |
| ItThreshA | N/A | R | Float |
| IU | N/A | R | Float |
| IV | N/A | R | Float |
| IW | N/A | R | Float |
| KdEnc | N/A | R/W | Decimal |

| Keyword | Sub-Element | Access | Preferred Format |
|---|---|---|---|
| KiEnc | N/A | R/W | Decimal |
| Kii | N/A | R/W | Float |
| Kip | N/A | R/W | Float |
| KpEnc | N/A | R/W | Decimal |
| Kpp | N/A | R/W | Float |
| Kvff | N/A | R/W | Float |
| Kvi | N/A | R/W | Float |
| Kvp | N/A | R/W | Float |
| Model | N/A | R | Decimal |
| MotorX | 1-2 | R | Signed |
| MoveXAccelRate | 0-7 | R/W | Float |
| MoveXDecelRate | 0-7 | R/W | Float |
| MoveXDistance | 0-7 | R/W | Long |
| MoveXDistOffset | 0-7 | R/W | Long |
| MoveXHomeDir | 0-7 | R/W | 1/0, On/Off, ASCII String |
| MoveXHomeMode | 0-7 | R/W | Decimal |
| MoveXRegSelect | 0-7 | R/W | 1/0, On/Off, ASCII String |
| MoveXRunSpeed | 0-7 | R/W | Float |
| MoveXType | 0-7 | R/W | Decimal |
| MoveDone | N/A | R | 1/0, On/Off, ASCII String |
| MoveSelectBitX | 0-2 | R/W | 1/0, On/Off, ASCII String |
| NVLoad | Not Supported in Register Monitors. Use with Function keys. | | |
| NVSave | Not Supported in Register Monitors. Use with Function keys | | |
| OutX | 1-4 | R/W | 1/0, On/Off, ASCII String |
| OutMapX | 1-4 | R/W | Decimal |
| Outputs | N/A | R/W | Decimal |
| PoleCount | N/A | R/W | Decimal |
| PosCmdSet | N/A | R/W | Long |
| PosCommand | N/A | R | Long |
| PosError | N/A | R | Long |
| PosErrorMax | N/A | R/W | Long |
| Position | N/A | R | Long |

| Keyword | Sub-Element | Access | Preferred Format |
|---|---|---|---|
| PulsesIn | N/A | R/W | Long |
| PulsesOut | N/A | R/W | Signed |
| RegXActiveEdge | 1-2 | R/W | 1/0, On/Off, ASCII String |
| RegXEncoderPosition | 1-2 | R | Long |
| RegXResolverPosition | 1-2 | R | Long |
| RemoteFB | N/A | R/W | Decimal |
| ResPos | N/A | R | Decimal |
| RunStop | N/A | R/W | 1/0, On/Off, ASCII String |
| StartMove | N/A | R/W | 1/0, On/Off, ASCII String |
| StopTime | N/A | R/W | Float |
| Unconfigure | Not Supported in Register Monitors. Use with Function keys. | | |
| VBus | N/A | R | Float |
| VBusThresh | N/A | R/W | Float |
| VelCmd | N/A | R/W | Float |
| VelCmd2 | N/A | R/W | Float |
| VelCmdA | N/A | R | Float |
| VelCmdSrc | N/A | R/W | 1/0, On/Off, ASCII String |
| VelErr | N/A | R | Float |
| VelFB | N/A | R | Float |
| VelLmtHi | N/A | R/W | Float |
| VelLmtLo | N/A | R/W | Float |
| Velocity | N/A | R | Float |
| ZeroSpeedThresh | N/A | R/W | Float |

### *For Recipe Presets:*

| Register | Sub-Element | Preferred Format |
|---|---|---|
| AccelLmt | Not Supported in Recipes. Do Not Use. | |
| ActiveMove | N/A | Decimal |
| ADF0 | Not Supported in Recipes. Do Not Use. | |
| ADOffset | Not Supported in Recipes. Do Not Use. | |
| AInNull | N/A | 1/0, On/Off, ASCII String |
| AnalogOutX | Not Supported in Recipes. Do Not Use. | |
| ARFX | Not Supported in Recipes. Do Not Use. | |
| AxisAddr | N/A | Decimal |
| CcwInh | N/A | 1/0, On/Off, ASCII String |
| CmdGain | Not Supported in Recipes. Do Not Use. | |
| CmdGain2 | Not Supported in Recipes. Do Not Use. | |
| CommSrc | N/A | Decimal |
| CwInh | N/A | 1/0, On/Off, ASCII String |
| DecelLmt | Not Supported in Recipes. Do Not Use. | |
| DMXF0 | Not Supported in Recipes. Do Not Use. | |
| DMXGain | Not Supported in Recipes. Do Not Use. | |
| DMXMap | 1-2 | Decimal |
| ElecAngTau | N/A | Decimal |
| Enable | N/A | 1/0, On/Off, ASCII String |
| Enable2 | N/A | 1/0, On/Off, ASCII String |
| EncAlignRampIcmd | N/A | Decimal |
| EncAlignTestDist | N/A | Decimal |
| EncAlignTime | N/A | Decimal |
| EncIn | N/A | Decimal |
| EncInF0 | Not Supported in Recipes. Do Not Use. | |
| EncMode | N/A | Decimal |
| EncOut | N/A | Decimal |
| FaultReset | N/A | 1/0, On/Off, ASCII String |
| GearingOn | N/A | 1/0, On/Off, ASCII String |
| HallOffset | N/A | Decimal |
| ILmtMinus | N/A | Decimal |

| Register | Sub-Element | Preferred Format |
|---|---|---|
| ILmtPlus | N/A | Decimal |
| InpMapX | 1-6 | Decimal |
| InPosLimit | N/A | Decimal |
| IntgStopThresh | Not Supported in Recipes. Do Not Use. | |
| ItF0 | Not Supported in Recipes. Do Not Use. | |
| ItThresh | N/A | Decimal |
| KdEnc | N/A | Decimal |
| KiEnc | N/A | Decimal |
| Kii | Not Supported in Recipes. Do Not Use. | |
| Kip | Not Supported in Recipes. Do Not Use. | |
| KpEnc | N/A | Decimal |
| Kpp | Not Supported in Recipes. Do Not Use. | |
| Kvff | Not Supported in Recipes. Do Not Use. | |
| Kvi | Not Supported in Recipes. Do Not Use. | |
| Kvp | Not Supported in Recipes. Do Not Use. | |
| MoveXAccelRate | Not Supported in Recipes. Do Not Use. | |
| MoveXDecelRate | Not Supported in Recipes. Do Not Use. | |
| MoveXDistance | 0-7 | Long |
| MoveXDistOffset | 0-7 | Long |
| MoveXHomeDir | 0-7 | 1/0, On/Off, ASCII String |
| MoveXHomeMode | 0-7 | Decimal |
| MoveXRegSelect | 0-7 | 1/0, On/Off, ASCII String |
| MoveXRunSpeed | Not Supported in Recipes. Do Not Use. | |
| MoveXType | 0-7 | Decimal |
| MoveSelectBitX | 0-2 | 1/0, On/Off, ASCII String |
| NVLoad | N/A | 1/0, On/Off, ASCII String |
| NVSave | N/A | 1/0, On/Off, ASCII String |
| OutX | 1-4 | 1/0, On/Off, ASCII String |
| OutMapX | 1-4 | Decimal |
| Outputs | N/A | Decimal |
| PoleCount | N/A | Decimal |
| PosCmdSet | N/A | Long |

| Register | Sub-Element | Preferred Format |
|---|---|---|
| PosErrorMax | N/A | Long |
| PulsesIn | N/A | Long |
| PulsesOut | N/A | Signed |
| RegXActiveEdge | 1-2 | 1/0, On/Off, ASCII String |
| RemoteFB | N/A | Decimal |
| RunStop | N/A | 1/0, On/Off, ASCII String |
| StartMove | N/A | 1/0, On/Off, ASCII String |
| StopTime | Not Supported in Recipes. Do Not Use. | |
| Unconfigure | N/A | 1/0, On/Off, ASCII String |
| VBusThresh | Not Supported in Recipes. Do Not Use. | |
| VelCmd | Not Supported in Recipes. Do Not Use. | |
| VelCmd2 | Not Supported in Recipes. Do Not Use. | |
| VelCmdSrc | N/A | 1/0, On/Off, ASCII String |
| VelLmtHi | Not Supported in Recipes. Do Not Use. | |
| VelLmtLo | Not Supported in Recipes. Do Not Use. | |
| ZeroSpeedThresh | Not Supported in Recipes. Do Not Use. | |

### *For Screen-Dependent Function Keys and Function Keys:*

| Register | Sub-Element | Preferred Action |
|---|---|---|
| AInNull | N/A | Latch |
| CcwInh | N/A | Push On/Off |
| CwInh | N/A | Push On/Off |
| Enable | N/A | Push On/Off |
| Enable2 | N/A | Push On/Off |
| FaultReset | N/A | Latch |
| GearingOn | N/A | Push On/Off |
| MoveXHomeDir | 0-7 | Push On/Off |
| MoveXRegSelect | 0-7 | Push On/Off |
| MoveSelectBitX | 0-2 | Push On/Off |
| NVLoad | N/A | Latch |
| NVSave | N/A | Latch |
| OutX | 1-4 | Push On/Off |
| RegXActiveEdge | 1-2 | Push On/Off |
| RunStop | N/A | Push On/Off |
| StartMove | N/A | Latch |
| Unconfigure | N/A | Latch |
| VelCmdSrc | N/A | Push On/Off |

### *Important Controller Memory Considerations*

| |
|---|
| If your controller's memory range is smaller than the range supported by Maple's OITs, it is possible to configure the Maple OIT to monitor a memory address which does not exist. Since this can cause unpredictable results, when you configure the Maple OIT please ensure that all selected memory addresses are valid for your controller model. |
| Do not configure the Maple OIT to write to any memory address which should only be written to by the controller. |
| When using the Bank 8 or Bank 16 register monitor formats to display information from discrete memory, the bits displayed must start on a byte boundary. The byte boundaries leave no remainder when the following formula is used: (discrete memory address -1)/8. |
| 4-digit BCD and 8-digit BCD formats do not support floating-point. |
| Any memory value specified by the controller that exceeds the displayable range specified by OITware will display the "Data out of Range" message until the value changes to within range or is no longer being read by the OIT (i.e. a screen is called that does not have this condition). The following example is with Signed Format and Decimal Location = 2 (displayable range is then 327.67):<br>Example1: If the controller memory = 1230.00, then the OIT displays "Data out of Range". |
| For the PC830 commands NVLoad, NVSave and Unconfigure, use either in Recipes or as Function keys configured as Latched. |
| PC830 Keywords with Floating Point format are not supported in Recipes or Setpoints. |

# OITware-200 Settings

The following table lists the communications settings that must be configured in OITware-200.
Please note:

- the Settings column lists OITware-200's recommended setting; your controller's default may be different
- the Options column lists OITware-200's options; your controller may not support every option

| Name | Settings | Options | Important Notes |
|---|---|---|---|
| Baud Rate | 19200 | 19200, 9600, 4800, 2400, 1200, 600, 300 | Must match the controller's configuration settings. Use the fastest baud rate supported by both. |
| Parity | None | Even, Odd, None, Mark, Space | Must match the controller's configuration settings. |
| Data Bits | 8 | 7, 8 | Must match the controller's configuration settings. |
| Stop Bits | 1 | 1, 2 | Must match the controller's configuration settings. |
| Node Address: | 255 | 1 to 255 | Must match the OIT Configuration setting. The global node address, 255, should not be used in a network since all drives respond. |

# Error Messages

“Can not connect ....”
The OIT could not communicate with the controller during initial communications. Check for consistent communication parameters between the controller and the OIT. Check the cable and connectors for integrity and correctness. Move cables away from noise sources. Check for proper grounding and power supply.

“Communication Error”
The OIT did not receive a response or a valid response. Check the cable and connectors for integrity. Move cables away from noise sources. Check for proper grounding and power supply.

“Error: Cannot Write!”
A write command was sent to the controller to write data to a register that is read only. Using OITware, make the register read-only access.

“Protocol Error”
The controller responded that the request was invalid. Check that the register is available and the type of access is allowed for the particular controller.

“Invalid Command”
The protocol driver was requested to perform an invalid command. Contact Maple Systems technical support.