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Find the *Newport XPS-C8* at our website: ***Click HERE***

XPS-DRV00P Pass-Through Board

&

XPS-DRV00 Pass-Through Board

Control for
Non-Newport Stages

Motor Card for Newport
Model XPS Motion Controller

Firmware Version 2.1.5
Document Rev. B

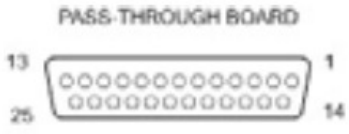
Last Update: 4/11/2008

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XPS-DRV00P Card Information

Pass-Through Board Connector (25-Pin D-Sub) XPS-DRV00P

WARNING
This pass-through board connector takes the place of the motor interface connector only if this axis is connected to an external motor driver.



Mating connector:
Male DB25 with UNC4/40 lockers

PIN	Function	PIN	Function
1	Reserved	14	Reserved
2	+ 5V	15	Inhibition output
3	Origin input	16	Reserved
4	- Travel limit input	17	Reserved
5	+ Travel limit input	18	Reserved
6	Main fault input	19	Encoder /A input
7	Encoder A input	20	Encoder /B input
8	Encoder B input	21	/index input
9	Index input	22	Reserved
10	Pulse / Pulse+ output	23	GND
11	Direction / Pulse- output	24	No Connection
12	Analog A output	25	GND
13	Analog B output		

XPS-DRV00P Pass-Through Connector

Analog A output and Analog B output have 16 bits resolution and are +/- 10 V output.
Theses signals are used to command an external driver.

Pins 10 and 11 are set to +5 Volts (high) by default as they are open collector type signals.

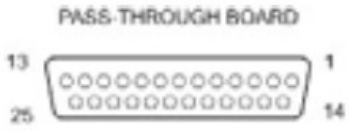
- **XPS-DRV00P** is a pass through board. It is an interconnect board for external amplifiers connected to the XPS controller developed for the new CIE05 board and requires firmware version 2.1.4 or later releases. It has Pulse features not available in XPS-DRV00 version of the board.

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4	- Travel limit input	17	Reserved
5	+ Travel limit input	18	Reserved
6	Main fault input	19	Encoder /A input
7	Encoder A input	20	Encoder /B input
8	Encoder B input	21	/index input
9	Index input	22	Reserved
10	No Connection	23	GND
11	No Connection	24	No Connection
12	Analog A output	25	GND
13	Analog B output		

XPS-DRV00 Pass-Through Connector

Analog A output and Analog B output have 16 bits resolution and are +/- 10 V output.
Theses signals are used to command an external driver.

- **XPS-DRV00** is a pass through board. It is an interconnect board for external amplifiers connected to the XPS controller.

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Motor driver model

The XPS controller supports 8 different settings for the motor driver model, including:

- *XPS-DRV00 or XPS-DRV00P for external driver*

The choice of a driver board setting depends on the used driver board, the driver command interface, the position servo loop type, and the motor type.

The XPS-DRV00 or XPS-DRV00P pass-through module can be used to pass control signals to other external third-party amplifiers (drivers). By setting the controller's dual DAC output to either analog position, analog stepper position, analog velocity, analog voltage or analog acceleration (including sine commutation), the XPS is capable of controlling almost any motion device including brushless motors, voice coils and piezoelectric stages.

More information on signals can be found in the User's Manuals, especially Appendix B.

Stages.ini setting:

XPS-DRV00 for external driver

Stages.ini file entry: *DriverName = XPS-DRV00*
The XPS-DRV00 is a pass-through board needed when connecting the XPS controller to an external motor driver. This setting of the motor driver model is compatible with all driver command interfaces.

XPS-DRV00P for external driver

Stages.ini file entry: *DriverName = XPS-DRV00P*
The XPS-DRV00P (DRV00 version #2) is a pass through board developed for the new CIE05 board. It is an interconnect board for external amplifiers connected to the XPS controller.

{Example of use in Stages.ini}
; Motor driver model
DriverName = XPS-DRV00 (or XPS-DRV00P)

The table following lists the needed settings for the position servo loop type, for the driver command interface and for the motor driver model for the most common motor types and feedback systems. But it shows only a small fraction of the total control and drive capabilities of the XPS controller.

Note: This the latest version of this table is in the Configuration Wizard documentation.

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Stage configuration	Position servo loop type	Driver command interface	Motor driver model
DC motor <= 3A with encoder and tachometer	PID with velocity output	Velocity control	XPS-DRV01 with tachometer feedback
DC motor <= 3A with encoder, no tachometer	PID with motor voltage output	Voltage control	XPS-DRV01 without tachometer feedback
DC motor <= 5A with encoder and tachometer	PID with velocity output	Velocity control	XPS-DRV03 with tachometer feedback
DC motor <= 5A with control encoder, no tachometer	PID with acceleration output	Acceleration control	XPS-DRV03 for acceleration
	PID with motor voltage output	Voltage control	XPS-DRV03 for voltage control
DC motor > 5A with encoder and tachometer	PID with velocity output	Velocity control	XPS-DRV00 for external driver
DC motor > 5A with encoder, no tachometer	PID with acceleration output	Acceleration control	XPS-DRV00 for external driver
	PID with motor voltage output	Voltage control	XPS -DRV00 for external driver
Stepper motor <= 3A with encoder	PI with position output	Sine/cosine position control	XPS-DRV01 for stepper motor
Stepper motor <= 3A without encoder	No servo loop with position output	Sine/cosine position control	XPS-DRV01 for stepper motor
Stepper motor > 3A with encoder	PI with position output	Sine/cosine position control	XPS-DRV00 for external driver
Stepper motor > 3A without encoder	No servo loop with position output	Sine/cosine position control	XPS-DRV00 for external driver
Linear/brushless motor <= 5A, double command input 120° UV phase driver	PID with acceleration output	120 deg UV phase acceleration control	XPS-DRV02
Linear/brushless motor <= 5A, single command input driver	PID with acceleration output	Acceleration control	XPS-DRV00 for external driver
Linear/brushless motor <= 5A, double command input (60° or 90° UV phase) driver	PID with acceleration output	Acceleration control - 60 deg UV phase - 90 deg UV phase	XPS-DRV00 for external driver
Linear/brushless motor > 5A	PID with acceleration output	Acceleration control - 60 deg UV phase - 90 deg UV phase - 120 deg UV phase	XPS-DRV00 for external driver

Common motor types and feedback systems

– See Configuration Wizard manual for more details

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Sample Stages.ini files with XPS-DRV00P and XPS-DRV00 boards:

```
;========================= XPS-DRV00P Example =====================
[SampleStage@XPS-DRV00P]
SmartStageName=

; Position servo loop type
CorrectorType=PIPosition
ClosedLoopStatus=Closed ;Closed Opened
FatalFollowingError=100
KP=0
KI=0
IntegrationTime=1
DeadBandThreshold=0.008
NotchFrequency1=0
NotchBandwidth1=0
NotchGain1=1
NotchFrequency2=0
NotchBandwidth2=0
NotchGain2=1
MotionDoneMode=Theoretical

; Driver command interface
MotorDriverInterface=PulseDir
DigitalStepperDirectionLogic=Negative ; Positive
DigitalStepperPulseLogic=Positive
DisplacementPerFullStep=0.016
MicroStepsPerFullStep=10

; Motor driver model
DriverName=XPS-DRV00P

; Position encoder interface
EncoderType=AquadB
EncoderResolution=0.004
LinearEncoderCorrection=0
Backlash=0
CurrentVelocityCutOffFrequency=25
CurrentAccelerationCutOffFrequency=25
PositionerMappingFileName=

; Limit sensors input plug
ServitudesType=StandardEORDriverPlug
MinimumTargetPosition=-30
MaximumTargetPosition=1570
HomePreset= -2.95
MaximumVelocity=20
MaximumAcceleration=80
EmergencyDecelerationMultiplier=1
MinimumJerkTime=0.1
MaximumJerkTime=1
TrackingCutOffFrequency=25

; Home search process
HomeSearchSequenceType= MechanicalZeroAndIndexHomeSearch ; CurrentPositionAsHome
MechanicalZeroAndIndexHomeSearch
HomeSearchMaximumVelocity=10
HomeSearchMaximumAcceleration=40
HomeSearchTimeOut=5000
```


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```
;========================= XPS-DRV00 Example ======================

[SampleStage@XPS-DRV00]

;--- unit = Dg.

;--- Stage
SmartStageName =

;--- Driver
DriverName =XPS-DRV00
DriverBrake =0; 0 or 1

;--- Motor driver interface
MotorDriverInterface =AnalogVelocity
ScalingVelocity =9.6; unit / sec
VelocityLimit =9; unit / sec
ScalingCurrent =1; not used
CurrentLimit =1; not used

;--- Encoder
EncoderType =AquadB
EncoderResolution =0.00025; unit
LinearEncoderCorrection =0; ppm

;--- Backlash
Backlash =0; unit

;--- Gathering Filters
CurrentVelocityCutOffFrequency =100; Hertz
CurrentAccelerationCutOffFrequency =100; Hertz

;--- Positioner mapping
PositionerMappingFileName =

;--- Travels
MinimumTargetPosition =-230; unit
HomePreset =0.639; unit
MaximumTargetPosition =230; unit

;--- Home
HomeSearchSequenceType =

MechanicalZeroAndIndexHomeSearch
HomeSearchMaximumVelocity =4; unit / second
HomeSearchMaximumAcceleration =2; unit / second2
HomeSearchTimeOut =90; second

;--- Profiler
MaximumVelocity =4; unit / second
MaximumAcceleration =8; unit / second2
EmergencyDecelerationMultiplier =1
MinimumJerkTime =0.05; second
MaximumJerkTime =0.5; second
MinimumMotionTime =0.01; second
TrackingCutOffFrequency =25; Hz

;--- Motion done
MotionDoneMode =Theoretical

;--- Corrector
CorrectorType =PIDFFVelocity
KP =20; 1 / sec
KI =40; 1 / sec2
KD =0
```


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```
KS =0.8
IntegrationTime =1E+99; sec
DerivativeFilterCutOffFrequency = 2000; Hertz
GKP =2
GKI =5
GKD =0
KForm =0.025
KFeedForwardVelocity =1
ClosedLoopStatus =Closed; Closed or Opened
FatalFollowingError =.1; unit
DeadBandThreshold =0; unit

;--- Notch Filter
NotchFrequency1 =0; Hertz
NotchBandwidth1 =0; Hertz
NotchGain1 =1
NotchFrequency2 =0; Hertz
NotchBandwidth2 =0; Hertz
NotchGain2 =1

;--- Servitude
ServitudesType =StandardEORDriverPlug
```


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