

# Configuring and using AMB lasers in IPGScan (dual analog output) – Reference Documentation

# Purpose

The purpose of this reference document is to show how to configure and use and AMB laser with two analog inputs with IPGScan. In this case, the power for the core and ring beams can be controlled completely independently in IPGScan.

# Equipment and Software

- 1. AMB laser with dual analog inputs
- 2. Scanner with updated IPGP583 board. Scanners built after Dec 2020 should have the correct board.
- 3. Cable between scanner controller and laser with the two analog signals and a single modulation signal for core and ring (details below)
- 4. ScanPack with version higher than 0.1.14913
- 5. IPGScan with version higher than 1.0.0.14937
- 6. Scan Controller image with version higher than 3.7.1
- 7. Correct LaserSpecification.xml for the AMB laser being used (from IPG's Beam Delivery Team)

# Procedure

## Wiring

The schematic below shows (in a very simplistic way, without considering other laser control signals and safety interlocks) how the two analog signals and the modulation should be connected



Figure 1 - Scanner to AMB wiring



Please note the two analog signals share a common return. Please note there is a single modulation signal for both core and ring.

For more information on the AMB wiring and configuration, please consult the AMB laser manual

#### AMB laser configuration

As with the regular YLS setup with the IPG scanner, the laser's External Control and External Analog bits must be set in order for the laser to follow the scanner's analog power control.

Both of these bits can be set in LaserNet (image below), when the laser is in Test mode, or through the hardwire or fieldbus interfaces (whichever is available with the laser). If External Control and External Analog are not set, the scanner will not be able to control the laser at all.

Ele Settings View Tools	um Multi-Mode Fiber Laser, SN:20072850) - LaserNet			
@ ? N?				
	Net Connection : OK			
	Power (kW)	Temperature (°0	C)	Laser ON Laser ready
		0 2	27	Guide laser
			J./	
				Emission ON
	Power (W) — Current (%)		Emission	Laser
	Central core 0 210 429 638 840 1950 1260 Ring core	0 1470 1680 1890 2100 V	OFF	ON
	0 410 829 1230 1640 2950 2460	0 2870 3280 3690 4100 ×	Tille Child	Reset
	Guide lasers	Laser program	Ramping time (ms)	
		Number ()	Rise time 0	External control
		RUN	0 Set	ON
		Program active	Fall time 0	Analog control
		Program is interrupted	0 Set	ON
	Status   Alarms   Warnings Control   Events   Logfiles   Power su	pply Dew Point Hardwing Modules		
				Robot mode Supervisor v2.237.4

Figure 2 - LaserNet Setup

## IPGScan Configuration

In order to change the power settings for core and ring separately, the "Enable AMB" setting in IPGScan must be set to true.

By default, "Enable AMB" is set to False and only the ring analog signal will be used.

To change the "Enable AMB", click on the Option button (View-Options, Alt+O), under Settings->Scan Controller, set "Enable AMB" to True



#### Reference Documentation

✓ Mac Display Peak Values Enable UI Animations Hide KeyHole Lock White Data Entry Notification Delay Previous User Processing Window Opacity On Remote Star	True True True False 5	
Display Peak Values Enable UI Arimations Hide KeyNele Lock While Data Entry Notification Delay Previous User Processing Window Opacity On Remote Star	True True True False 5	
Enable UI Animations Hide KeyHole Lock While Data Entry Notification Delay Previous User Processing Window Opacity On Remote Star	True True False 5	
Hide KeyHole Lock While Data Entry Notification Delay Previous User Processing Window Opacity On Remote Star	True False 5	
Lock While Data Entry Notification Delay Previous User Processing Window Opacity On Remote Star	False 5	
Notification Delay Previous User Processing Window Opacity On Remote Star	5	
Previous User Processing Window Opacity On Remote Star		
Processing Window Opacity On Remote Star		
	1 1	
Prompt User For Group Id On Create	False	
<ul> <li>Scan Controller</li> </ul>		
Enable AMB	True	~
Enable Stored Jobs	True	
Interface Board	False	
Last Connected Prompt On Startup	False	
Last Connected Scan Controller	laser-801f123fcb4f local	
Monitor Enable	False	
Shape Defaults		
Circle Radius	10	
Default Columns	5	
Default Height	10	
Default Length	10	
Default Point Array Distance	2	
Default Radius	2	
Default Rotation	0	
Default Rows	5	
Default Segment	2	
Default Spiral Revolutions	5	
Default Width	10	
Hershey Font size	5	
V TCD/ID	-	~
	Encide AVIE     Encide Stored Jobs     Inteface Board Jobs     Inteface Board     Last Connected Prompt On Statup     Last Connected Prompt On Statup     Last Connected Prompt On Statup     Last Connected Sean Controller     Montor Enable     Vortable     Default Route     Default     Default Route     Default Route     Default	Ince         Ince           Enable Store Allos         Ince           Frable Allos         Ince           Interface Board         False           Last Connected Scan Controller         Laser-8011123/cb4 Jocal.           Montor Enable         False           Crick Radus         10           Default Hoght         10           Default Hoght         10           Default Hoght         10           Default Radus         2           Default Rotation         0           Default Rotation         5           Totation         5           Default Row Farmer         5           Default Streation         5           Tota

Figure 3 - Setting "Enable AMB" to True

#### Laser parameters

Once "Enable AMB" is set, two additional field for laser parameters will appear in the object's property area:

$\sim$	Processing	
	Laser	🚺 Laser
	<ul> <li>Vectors Welding</li> </ul>	
	<ul> <li>Vectors Welding</li> </ul>	
	Velocity	1000
	Laser Power	1000
	Ring Laser Power	2000
	Pulse Width	0
	Pulse Frequency	1000
	Wobble On/Off	False
	Energy Offset	(Collection)
	Ring Engery Offset	(Collection)

Figure 4 - Ring Laser Parameters

The "Ring Laser Power" sets the laser power value (in watts) for ring beam and Ring Energy Offset opens the Energy Offset profile editor for the ring beam. Different Energy Offset profiles can be created for core and ring beams, however the length of each segment in the profile is common for both (please refer to the IPGScan manual for details on Energy Offset).