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

DB15 Male	
Pin	Signal
1	Analog Ctrl Core
9	Analog Ctrl Core Ret
2	Modulation +
10	Modulation Return
3	Guide Control
11	Program Start/EE
4	Power Supply Active
12	Error/Ready
5	System GND
13	Emission ON
6	Gate
14	Power FB
7	Not Used
15	Analog Ctrl Ring
8	FlowActive

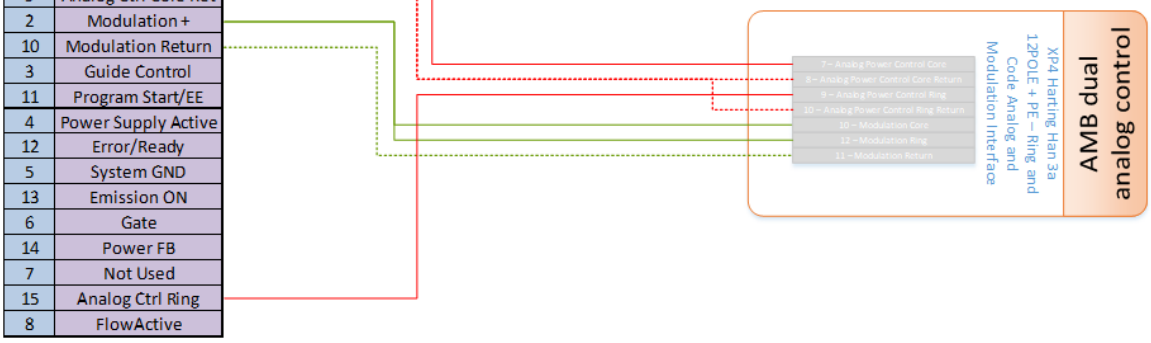

Figure 1 - Scanner to AMB wiring

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.

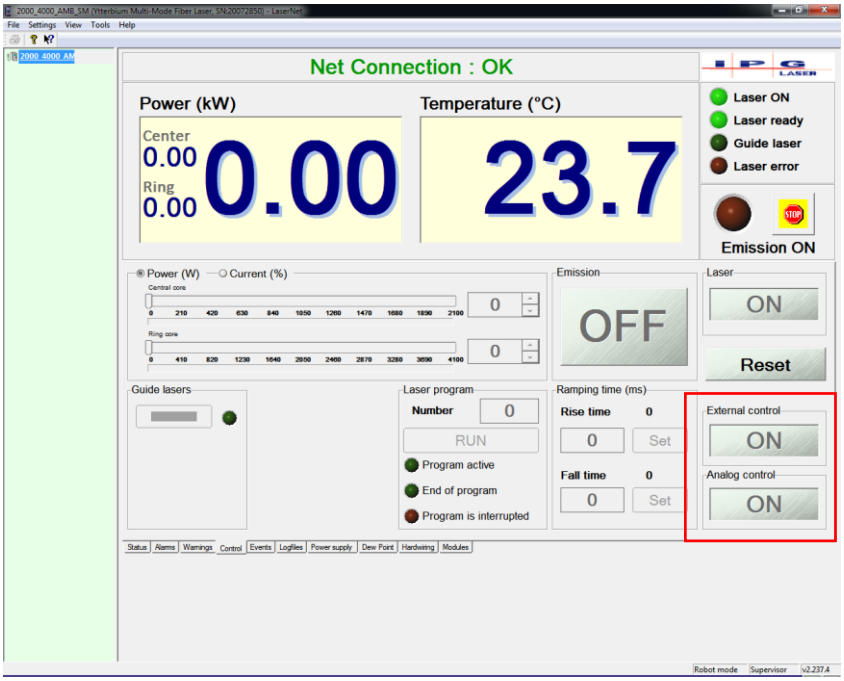

Figure 2 - LaserNet Setup

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 **<u>False and only the ring analog signal will be used.</u>**

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

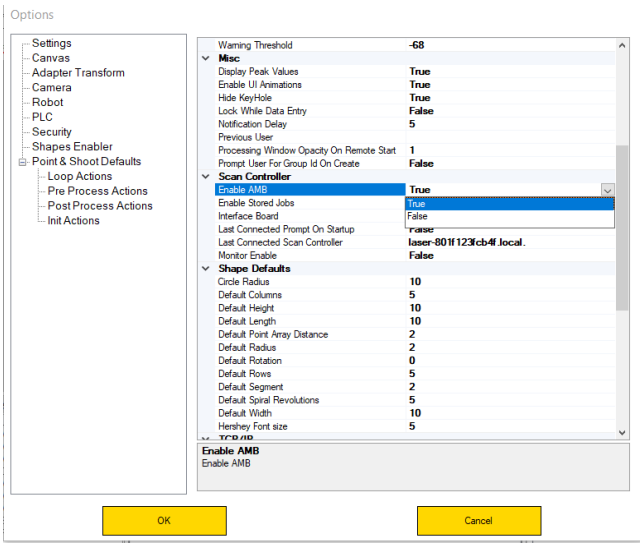

Figure 3 - Setting "Enable AMB" to True

Laser parameters

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

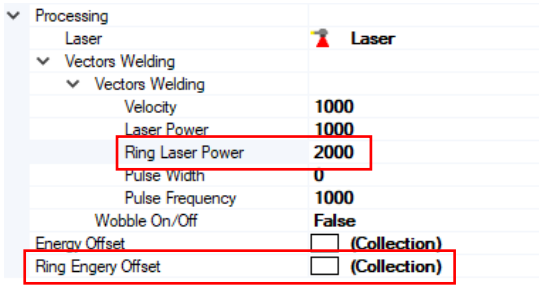

Figure 4 - Ring Laser Parameters

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).