redPOWER®
FiberView
Laser Control Software
Introducing FiberView

Our FiberView graphical user interface (GUI) provides a comprehensive range of software tools and features for getting the most out of the redPOWER Fiber Laser product suite.

FiberView is used to configure, control and monitor redPOWER Fiber Lasers. It enables configuration of program parameters and process cycles, it shows the current and historical system status, and it will alert the user to any maintenance requirements and aid in fault diagnosis.

FiberView is an advanced laser control system offering many features not available in other products.

FiberView has been designed to operate exclusively with the FiberView control unit (FVCU) as used only on redPOWER Fiber Lasers. The FVCU provides a comprehensive laser control system with integral pulse generator, user configurable machine control interface, on board storage for laser parameter sets, data and various serial interfaces.

Key Feature List

- Easy programming of laser parameter sets / pulse shaping
- Process cycles allowing different laser parameters to be used in sequence
- Pierce detection capability
- Laser metrics monitoring (real time and historical)
- Data logging of all alarms / events / warnings
- Process cycle wizard
- Laser run timers
- Library shape preview
- Auto search for connected lasers on LAN or peer-to-peer
- User set point for solenoid valve temperature control (when fitted)
- Simulation mode – for operator training, process preparation and viewing of laser history and to safely familiarise the user with FiberView operation.

Advantages in the Production Environment

- Different levels of access (maintenance, supervisor, and operator) are allowed to the features of the program for safe control of the redPOWER Fiber Laser in a production environment
- An initial configuration of the laser can be set from FiberView, and stored within the FVCU
- Operation of the laser via hardware control only, after initial set up with FiberView
- Monitoring and logging of all laser parameters and events for quality control and routine maintenance purposes.

FiberView Benefits:

- A graphical user interface (GUI) for optimisation of laser material processing parameters
- Easy programming of laser parameter sets/pulse shaping - linked to on-board pulse generator
- Easy configuration of digital machine interface
- Process cycles for automatic parameter changes
- Laser metrics: temperatures history, operating hours etc
- Control & monitoring on local PC or over network connection
- Multiple international languages.

Go to spilasers.com/products for information on accessories, extended warranties and longer beam delivery optic lengths.
Flexible Communication Options

- Serial communication via ethernet or RS232
- A configurable digital machine control interface (MCIF) compatible with wide range of programmable logic controller (PLC) systems
- Allows system integrators flexibility to design different interfaces
- User selectable functions:
  - 7 Inputs with 22 functions
  - 7 Outputs with 44 functions
- Dedicated high speed trigger input
- Control of alignment laser
- ‘Pierce Detect’ flag output (for multi-kW lasers with high power combiner, HPC)
- Allows flexibility in control system architecture to share functions between FiberView and hardware control.

Pulse Shaping

- FiberView allows graphical programming of any arbitrary pulse shape, which is faithfully reproduced by the laser output
- Up to 50 user defined shapes available
- Each user defined shape can be allocated a variable number of segments as long as the total segments required doesn’t exceed 1000
- The segments have a resolution of 1µs
- Graphical Editor for defining pulse shapes
- A User defined shape can be used in many parameter sets with different power and duration values.

Process Cycles

- Series of steps defining simple or complex laser processes
- Each process cycle step may be independently configured to use different laser parameters
- Process cycle may be configured:
  - to automatically move on to the next step
  - to wait for operator or control system signal
- Up to 1000 process steps can be defined an allocated across 50 process cycles
- Wizard for easy set-up
- Complex process cycles may be created and edited offline
- Files may be saved to and retrieved from the hard drive
- The following operations are possible using the MCIF:
  - Start and stop the process cycle
  - Step on to the next process cycle step
  - Select one of the locally stored process cycles
- Apply analogue control signal to adjust the laser output power within the process cycle
- Monitor the process cycle progress:
  - Current step number
  - Current cycle number
  - Process cycle state.

Process Cycle Benefits:

- Complex process cycles easily created and edited offline
- Reduced programming and workload for system controller
- A complex process cycle can be commanded with single input trigger
- User defined pulse shapes can be included
- Fast, accurate laser control from integrated pulse generator hardware.

Pulse Shaping Benefits:

- Optimising metallurgical properties
- Improving cosmetic appearance
- Pulse shaping is very beneficial when processing:
  - Powder metallurgy parts
  - Highly reflectivity materials
  - Crack sensitive alloys (aluminium)
  - Dissimilar melting points materials
  - High carbon steels
  - Coated materials
  - Painted materials.
Pierce Detect

An SPI Lasers ‘breakthrough’ - integrated pierce detection function helps optimise cutting productivity.

- All laser cutting systems need some form of pierce detection to operate economically:
  - Importance depends on material & thickness
  - Without it, long pierce dwell times have to be programmed in
  - Due to processing variations, these can be up to 3 times longer than needed
- Many commercial systems are available, but usually mean:
  - Extra optical surfaces in beam path
  - Larger process head space
  - Increased system cost
- We have developed a proprietary system that is integrated into existing laser hardware and software:
  - Available for all multi-kW Fiber Lasers using a high power combiner (HPC)
  - Using pierce detect can offer 5-15% improvement in laser cutting productivity, depending on specific material
- Ready to integrate to system level controller
- SPI Lasers control electronics and software, Fiberview, uses a back reflection (BR) signal to produce a pierce flag:
  - The flag is presented on any of the programmable pins on the MCIF
- Setting of user programmable variables enables optimisation of the pierce detection to a particular process.

Often piercing is carried out by pulsing the laser during the pierce to give a slower but very controlled process.

We have demonstrated that the pierce detect feature will properly respond under pulsed conditions. This is controlled by setting the sample time parameter to an appropriate duration depending on the laser pulse frequency.

FiberView Architecture

FiberView and its software suite have been designed for independent use if required. The software items available for use with redPOWER Fiber Lasers include:

1. FiberView – GUI to configure, control and monitor redPOWER Fiber Lasers
2. PrismView - GUI to configure, control and monitor redPOWER laser modules
3. SHUI – GUI to create and edit designs for welding, cutting and marking laser processes

In addition, we make available the communications and control protocol dynamic link libraries for controlling redPOWER Fiber Lasers. These are designed to allow the user to tightly integrate the Fiber Laser system level controller HMIs (human machine interface).

However the protocol for controlling redPOWER Fiber Lasers is available from us to allow users to integrate control of redPOWER Fiber Lasers into an overall system controller.
Control Unit Benefits

Add the following benefits of FiberView to a redPOWER PRISM module by combining it with the optional FiberView control unit (FVCU).

FiberView Control Unit Benefits

**On Board Parameter Sets:**

- 50 on board parameter sets allow for rapid changing of output characteristics without the overhead and time restrictions of having to download a full parameter set each time
- You could change the output power for each spot in a process (depending on the required frequency) if desired
- Can be changed from the PC or via the machine interface.

**Multi Function Configurable Machine Interface:**

- The available physical digital I/O can be configured to suit the application from a collection of pre-defined functions for both inputs and outputs
- It can be changed easily if different pre-defined functional behavior is required on an existing customer connection
- Certain pre-defined functionality changes automatically depending on the mode of the laser
- One input is optimised for high speed trigger functionality but it can be re-defined if not required as a trigger input.

**Advanced Diagnostic Monitoring:**

- The FVCU will automatically gather diagnostic information from any connected PRISM modules
- Faults generated within the laser module are reported by the FVCU, and the FVCU will stop the laser demand if required
- Diagnostic data is automatically read by FiberView.