

April 24, 2018

TRAINING LOCATION

## Customer

A research lab engaged in the development of fibre optic gyro system for defence forces.

## Problem Statement/Requirements

The customer requires special fibre optic couplers which maintain the polarization of light when passed through. These couplers were a critical component of the optical gyroscopic system used in the guidance programme. The research lab wanted technology as well as a system to be developed which can continuously produce rugged grade fibre optic couplers. The components are expensive in the market mainly due to the advanced technology involved in producing those.

## Solution Methodology

SFO conceptualised, designed and developed a totally new machine, with the technology to optically align the polarization axes of the special fibre using a camera vision system and rotary actuators. The fibres were then kept in close contact by a custom designed precision holder, while the fusion process was conducted using the hydrogen flame technique. The controlling software and the detailed process to fabricate various versions of the coupler were also developed by SFO.

Different teams of SFO Technologies such as Electronics, Mechanical, Fibre Optics and Software division worked together to develop this solution. The steps involved included:

- ❖ Product conceptualization (including hardware and software)
- ❖ PoC and approval by the customer
- ❖ Analysis and finalisation of the specifications
- ❖ Design the system
  - Firmware and hardware architecture
  - Circuit design
  - Database design
  - Mechanical design
- ❖ Hardware and firmware development
  - Manufacturing and Integration of the machine
  - System Bring Up and Verification
  - Software development
- ❖ Software and hardware integrations and testing
- ❖ Implementation of system at client location
- ❖ Acceptance testing

## Brief description of product:

### A. Hardware

- DMC - 41x3 motor controller card
- 6 Axis Stepper Motors
- NI PCI - 6220 Card
- AFC50D Mass flow controller
- DNVideoX image acquisition system

### B. Software

- Control Software was developed in microsoft.net framework with Visual C
- SQL server as Back end
- Architecture consisted of 4 Layers. FibreSoftUI (Presentation layer), FBTController (Process Layer), Hardware Library, DataAccessController (Data Access layer)

### C. Compliance

- IEC 60950-1, EN 55022

## Impact

- Our solution made the customer capable of manufacturing hundreds of fused fibre couplers per month at a very competitive economic level.

## About SFO

SFO Technologies Pvt Ltd, the flagship arm of the diversified conglomerate, the NeST Group provides end-to-end design-engineering-software-manufacturing solutions to clients across geographies such as the USA, Canada, Europe, Middle East, South East Asia, Japan, Australia, and India. SFO has invested in building competence, scale and standards compliant process framework, in PCBA, fibre optics, Cable & wire Harness, Magnetics, High Level Assembly, VLSI design, embedded software development, etc. SFO's capabilities transcend the plain vanilla "Build-to-Spec or Build-to-Print" EMS and our ODM+ solutions are rapidly re-defining standards for the OEMs across Aerospace & Defence, Communications, Transportation, Healthcare and Energy & Industrial domains. .



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