



Case Studies

**Product Development
& Manufacturing**

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1. Online Water Quality Analyzer
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Online Water Quality Analyzer

The Customer

The Customer is an OEM from the USA with expertise in the field of Process Instrumentation for Chemical Analysis.

The Project

To build a low-cost, Online Water Quality Analyzer for analysis of Silica & Phosphate, and conforming to standards CE, UL, CSA and RoHs.

Time-frame: 8 Months.

Technology

The Instrument uses an Operating System, Arm-Linux, a variant of Linux, to run a 32-bit processor, operating at 180MHz. The fluids are moved through the instrument using peristaltic pumps, operated with stepper motors, at rates governed by the type of analysis required. Measurement is done, on-line, using a colorimetric technique (or) ISE technique, and the results displayed graphically on a large Liquid Crystal Display.

Salient Features

1. Programmable to different configurations before shipping to the end-user.
2. The user has the choice to select different input streams and reagents.
3. Programmable for self-cleaning and priming.
4. Calibration can be done automatically at predefined intervals.
5. Method of calibration can be also chosen by the user.
6. Auto -ranging facility
7. The instrument is capable of operating unattended in the field for long periods of time.
8. It is intelligent enough to recognise power failures and recover.
9. The analysis results can be transmitted over Local Area Network, RS485 or a 0-20mA Current Loop.
10. 30 day data stored inside can be downloaded to USB device
11. User Interface simulation on PC to control the instrument remotely via LAN.
12. Multilanguage support



Benefits to Customer

1. Collaborative R&D (ELICO's technical expertise & Customers domain Knowledge)
2. Development costs recovered in terms of royalty
3. Product Standard Certifications completed locally for CE, UL
4. Manufacturing of the product at ELICO

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Design & Development of Low-cost Color Tester

The Customer

A leading Instrumentation company from Europe, part of a global conglomerate which is a leading manufacturer of advanced monitoring, testing, calibrating, measurement and display Instruments sold to the process, aerospace, power and industrial markets worldwide.

The Project

The customer had an earlier color tester, which was costing about 10,000 EURO, and was not able to penetrate into the market hence contacted ELICO to develop a low cost color tester to measure the color of liquid petroleum products as per Saybolt, ASTM, and Pt-Co-Color scales.

Technology

Instrument works on Colorimetric principle for measurement of Color number that correlates with human eye perception. Instrument is built on 16-bit micro controller platform with an external 256 KB flash memory. It uses series of interference filters to acquire transmission spectrum in the visible range. User interface is through keyboard (internal/external) and 128 x 64 pixel graphic display.



Salient Features

1. Portable instrument for Laboratory and mobile use.
2. Data storage up to 100 measurements with sorting feature.
3. In system keyboard or external keyboard for ease of use.
4. Graphic display.
5. Optional heater module for heating solid samples.
6. USB and Serial ports for external communication.

Benefits to Customer

1. Industrial design done as per the customers existing product range
2. Saving on Bill of Material cost > 50%
3. Portable instrument: About 20% reduction in weight & 30% reduction in size compared to an existing product
4. Availability of domain expertise at ELICO meant client's resources are freed for new product development.
5. Manufacturing the product at ELICO

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Atomic Absorption Spectrophotometer

The Customer

A leading Instrumentation company from USA in Design, manufacture and deliver advanced technology solutions that address the world's most critical health and safety concerns, including maternal and fetal health, clean water and air, and safe food and toys.

The Project

The customer is market leader in Atomic Absorption Spectrophotometers (AAS), and has requested ELICO to design & manufacture a low cost entry level AAS to meet the demands of the emerging markets.



Customer Issues

1. Double beam optics.
2. Six-lamp turret.
3. Multi Language support (English, Chinese, German, French).
4. A Czerny-Turner optical design with a 330 mm focal length monochromator A 1,800 lines/mm holographic coated grating.
5. Wavelength range 190 to 900 nm. Deuterium (D2) lamp background corrector.
6. Continuously monitoring of critical components, including burner, flame ignition, gas pressure and flow rates, drain status, and many others. If any system check indicates an unsafe operating condition, the flame is automatically extinguished for ensured safety.
7. The gas flows are automatically adjusted to the proper levels for safe operation. The safety interlocks also allow safe shutdown if power is interrupted.
8. Both alphanumeric and graphic data may be printed using any dot matrix printer or the Lexmark E260d Laser printer.

Benefits to Customer

1. Industrial design done as per the customer's existing product range.
2. Designing & Manufacturing a low cost AAS at a transfer price of USD 6000.
3. Working as an extended engineering team to the customer.
4. Project completed in Less than 1 Year (Elico's AAS IP used as part of the development).
5. Product Standard Certifications completed locally for CE, UL as per customer requests.
6. Regular on-site visits to the customer during the product development.

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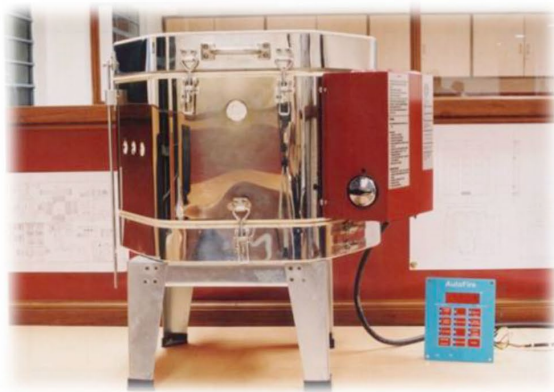
PID based Temperature Controller

The Customer

The Customer is leading manufacturer of a range of thermoanalytical instruments (dilatometers, gradient furnaces, and glass testing instruments) designed specifically for ceramics, glass, whitewares, structural clay, refractories, technical ceramics, investment casting bodies, electronic ceramics, electrical ceramics, advanced ceramics, and other materials for R&D, QC, and educational applications.

The Project

Development of PID based temperature controller.



Salient Features

1. The controller is used to control the temperature of a kiln to fire Gold, Bisque, Earthenware, stoneware and porcelain, Decal, Luster etc
2. The controller measures the rate of rise in temperature and controls the heating elements to deliver required amount of heat energy using the PID algorithm.
3. Controller Supports both user programs where user can program the desired ramp rates and hold times, and also the standard cone programs provided by the manufacturer.
4. Multi zone control, up to 3 zones.
5. Advanced options and alarms
6. Factory and OEM configuration settings.
7. Supports S, R & K type thermocouples.
8. Configurable to preset firing programs or user defined programs.
9. PC interface for monitoring and control.

Benefits to Customer

1. Design & Manufacturing of the product, Technology Transfer to the customer.
2. Time period 6 months.
3. Dedicate resource to support the product customizations.
4. Manufacturing of 10,000 modules per year.

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Chemical Warfare Agent Detector

The Customer

The Customer is a defense establishment.

The Project

Development of Portable Hand Held Flame Photometer Detector for detection of Phosphorus and Sulphur based Chemical Warfare Agents.



Salient Features

1. Detects nerve and mustard agents and identifies Vx in liquid and vapor forms.
2. Monitor initial contamination and screening of casualties who may be contaminated.
3. Monitor residual contamination after decontamination of personnel and casualties, equipment, infrastructure and ground.
4. Immediate detection of chemical contamination by flame spectrophotometry (sulphur & phosphorus atoms).
5. Simultaneous G, V, HD agent detection.

The Advantage

1. Involved in technology research & requirements.
2. Design & Development of a prototype instrument.
3. Prototype developed in 18 months.
4. Deploying resources for field validation.

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