MSE Systems and Optical Systems

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Business Description:

MSE specializes in systems integration of laser diode, electro-optic, and instrumentation system design. We consult and manufacture in these markets. We use LabVIEW, Visual Basic, Autocad, and other computer tools for the design process.

Systems Integration of Test Systems

MSE's business consist of systems integration of optics, mechanics, electronics, with computer control. Much of MSE's recent work involves system integration of motion control, sensors, test equipment and software development. Many times I utilize my mechanical engineering skills to add design not possible with off the shelf components and software. Standard electronic engineering practices are applied to minimize noise and maximize signal integrity.

MSE is specializing in Electro-optic Device Test Systems Integration. Most systems include parametric testing, farfield beam measurements, and optical spectral analysis. MSE believes that LabVIEW from National Instruments provides an excellent platform for software control of these systems. MSE will help you design and plan the system and select the best equipment.

MSE's industry experience includes these technologies:

- Systems Integration
- Machine and Research Vision Systems, Industrial sensors
- Laser Diode Test Systems
- Optical instrumentation:
  - Interferometers, spectrometers, ellipsometry, telescopes, microscopes, LIDAR scanners, Collimators, and more…
- NASA Space Shuttle
- Biomedical instrument design
- Computer disk drives
- Consumer products
- Manufacturing technology, Thermal analysis, Catalytic converters

MSE's associates with many local designers, machine shops, engineers, and scientist. MSE can bring a skilled group to focus quickly on a wide range of problems.

MSE will be happy to work with your company to establish a system specification, equipment requirements and assist in project planning to get your laser diode system up and running. In addition MSE can provide systems integration services in part or in whole.

Software

Programs are written in LabVIEW for Windows and are supplied as Virtual Instruments (VIs) in or as executable compiled programs. That is you do not have to purchase LabVIEW to run the applications if you do not expect to edit the program operation. LabVIEW can manage and uses data from other DOS or Windows programs.

More information on LabVIEW is available from National Instruments at (800) 433-3488. In some cases the LabVIEW application can be ported to Visual Basic, Basic, C or C++ if desired for an additional cost.

Other platforms (Mac, Sun) can run the actual VI's if all hardware specific alterations are implemented by the customer.

Development Plan Outline

It is preferable to integrate an operating system or components. That is a system component that works on a stand-alone basis without being in the system. When each component is debugged stand-alone then the integration is quicker.

The customer usually knows what he wants after working with the equipment. MSE can cement it together with LabVIEW for a complete integration.

In some cases the customer can send a component sub assembly to MSE and have the VI development done while the rest of the systems remains operational.

Steps:

1) Write a specification with the customer. Test types, functions, durations, and reporting formats, are listed and agreed upon.
2) Build the system in stages and test each one for system requirements. The customer will often work with the equipment to establish the feel of the desired final integration. Equipment performance limits are usually determined during this stage. MSE can help you at your location.
3) Refine elements after lab testing or use.
4) Integrate separately or by piece.

Integration

Each component is integrated into an overall test plan with a final output. This can be as simple as a device pass/fail note on a screen to a full printout of measurement analysis or properties.

Equipment used by this system may be selected from MSE's list of vendors or specified by you. All equipment selected needs to be approved by MSE as compatible with the system design. If VI's or software drivers exist then the job is simpler. In all cases it is best if the computer control can be simulated by manual control of the instrument so the user can become familiar with it's use and function, prior to finalizing the software specification.

Some companies have offered to loan demo equipment for integration and programming here at the MSE lab in Boulder.

Cost & Terms

System Design:
In most cases MSE can provide a rough estimate of system cost when you know your requirements and specifications. A list of vendors supplying test equipment is available for use during the full system-planning phase. MSE will provide quote based on the use of equipment from these vendors. If you prefer vendors not included on the MSE list then please let us know about them so they can be added to our list. It is helpful to have a block diagram and list of systems test requirements for review by MSE in order to produce an accurate proposal.

If you want to develop your system in-house, MSE can provide a system plan. For a full specifications and specify the equipment. The negotiable fee covers the next 60 days upon payment receipt and is non-refundable. It will includes a detailed parts list, system block diagram, and selection of all measurement instruments, computer controllers, layouts of custom mechanical parts, schedule, time estimates, and price estimate on all elements. The fee usually does not cover any programming or detail drawings. (In some cases software and design is included in the fee if noted in this agreement.)

Later, if you elect to contract with MSE for integration for a fixed price contract then the fee is credited to the total project cost once a Purchase Order or contract is established with MSE to build the system. For time and material contracts there is no credit.

The terms and specifications of this agreement are subject to change. In some cases initial fees may be waived if the magnitude of the project warrants.

Off-Site (at MSE's office in Boulder)
Once planning is complete and actual work starts time is billed hourly or a fixed cost is negotiated.

On-Site (Your office)
Other expenses are billed at a flat fee per day for on site work. One billable day is added for all travel for each trip that includes an overnight stay. Travel, car rental,

meals, and lodging, and all other customary expenses are charged to the project plus 25% if not prepaid or by agreement.

Tooling and Equipment

Expenses or tooling and equipment will be billed to your project in advance or per contract. A 25% surcharge is added to all items directly purchased by MSE unless an advance payment is included in the PO or contract.

General

All equipment that is delivered to MSE's facility for integration is ordered by the Customer and must be insured by the customer for all losses. MSE has standard business insurance, but may not be wholly covered for the loss of the property of others. (MSE has not suffered a loss to date.)

A purchase order and statement of work (or contract) is required for all projects.

It is important to communicate all relevant technical data to insure a successful project. If the customer is unsure please communicate it to be sure.

Unless otherwise agreed upon a letter of credit is required in the amount designated. In some cases MSE’s attorney will write a binding contract. All prospective Customers must read and sign this document prior to placing an order with MSE. By your signature you acknowledge that you agree to the terms as stated in this document.

I have read and understood this document and will abide by its terms unless exempted from any specific term by an attached signed written agreement.

Customer's signature_____ Date_____

Print name_____ Title _____

Company _____

Contact info _____