Foreword

COSMATT is a training course focused on the sizing of electric servo motors and the associated analysis of servo systems. The name COSMATT is an acronym for Compro’s Online Servo Motor Analysis and Training Tool.

COSMATT is meant for engineers who want to learn the basics of sizing servo motors. It also provides a useful online reference for motion control professionals. The course material covers a range of topics that are essential for understanding how to properly size electric servo motors. The course starts with a chapter on Fundamentals to refresh the key engineering concepts used in servo sizing, including - units, mass & inertia, force & torque, electrical quantities, motion equations, RMS and other basic concepts. It then takes the user through a series of topics that are related to the key aspects of servo sizing. These include Motion Profiles, Analysing Rotary and Linear Loads, Servo Motor Selection and Transmission Ratio Optimisation.

The current version of COSMATT is a basic level course. The authors and Compro also have plans to create an advanced version of the course, which will address many of the more complex topics associated with servo sizing.

The training approach used in COSMATT includes a mix of theory and practice problems, with assessment problems at the end of each chapter (topic). A complete chapter at the end of the course is devoted to application examples, where all the principles taught in earlier chapters are applied to a typical 10 axis production line. The user is first shown how to solve the 10 axes and then asked to test his or her understanding by independently solving a variation of the same 10 axes.

The course utilizes the latest software and digital technology, to create a highly interactive state-of-the-art online learning experience. It contains several tools which engage the user and help enhance learning and problem solving, including - a motion profile editor, a torque speed curve tool and an inertia calculator. These online tools create an engaging experience and should help improve the learning experience. COSMATT also makes extensive use of a spreadsheet based tool (comproDLS Leonardo) to provide a real life experience in working with spreadsheet based tables and assessment problems.

COSMATT includes an elementary online sizing tool to promote self-exploration and experimentation using the concepts learned from the course. While this tool is not intended for full feature sizing it can be used to illustrate the concepts presented in this course. It is recommended that the user first complete the training course before exploring the sizing tool.

COSMATT has been authored by John Durrant, Graham Elvis and Roger Brookes. All have many years of experience in the field of motion control and servo sizing, and have worked with Compro for over 15 years. It has been my privilege to have been associated with the authors for almost 20 years. I first met the authors when they were working at the Rockwell center of excellence in Crewe, UK. We worked together for many years on Motion Analyzer, Rockwell’s well known servo sizing tool. COSMATT attempts to pass on the many years of knowledge gained by the authors in their professional careers to future generation of engineers involved with motion control.

COSMATT has been developed by Compro Technologies, a company with extensive experience in developing motion control and sizing software solutions. Compro’s past clients in the field of sizing and selection software include Rockwell Automation, Danaher Motion (Pacific Scientific, Kollmorgen, Giddings and Lewis Controls, Warner Electric), Parker Hannifin, Emerson Control Techniques and Thompson Industries (Philips Airpax). Compro also has extensive experience in developing online learning solutions and has recently developed a new learning suite (comproDLS) to help publishers create highly effective online digital products.

COSMATT has been created using the comproDLS learning suite and offers numerous customization options for manufacturers who wish to adopt it for their training needs. The customizations include branding, manufacturer specific product (motor) data, customized content, class management tools and authoring tools. Compro also invites inquiries from manufacturers who may wish to use comproDLS product suite to develop high quality digital solutions related to other training needs. Please contact Compro for additional information ([www.comprotechnologies.com](http://www.comprotechnologies.com)).

User feedback and comments are important and most welcome. They will help guide the authors to evolve the course make it more relevant.

Happy sizing.

**Dr. Gurdial Singh**

[gsingh@comprotechnologies.com](mailto:gsingh@comprotechnologies.com)