Interfaces in Circuit Board Assembly

SECS/GEM, SRFF & GenCam

March 24-25, 1999
October 6-7, 1999

Continuing Education
Georgia Institute of Technology
A Unit of the University System of Georgia

Center for Board Assembly Research (CBAR)
**Course Description**

**Machine Communication (SECS/GEM)**

The purpose of this course is to define the critical concepts related to the application of the standards for managers and engineers to make strategic decisions. Today, most new models of SMT equipment from major OEMs provide SECS/GEM interface. Potentially, SECS/GEM interface provides near “plug-and-play” communication to SMT equipment. The generic communication protocol and predefined equipment behavior can potentially result in cost and time savings in setting up production and process control in multi-vendor lines. More importantly, the interface can result in cost and time savings with changes of hardware, software, database, and controls.

In addition, standards and equipment interface manuals are thick documents that do not provide cost/benefits analysis or application discussion. It is difficult to determine what capabilities are important for what applications and what capabilities are less useful in board assembly.

**SECS/GEM Topics**

- Introduction to the SECS/GEM standards
- Equipment implementation issues
- The cost and benefits
- Current and upcoming commercial products in the industry
- What can be achieved via SECS/GEM in SMT
- Potential problems
- Software and application development

**CAD/CAM Data Transfer Standards (GenCam, SRFF)**

This course will also provide an overview of two data transfer standards that are emerging in the electronics manufacturing industry: GenCam and the Standard Recipe File Format (SRFF).

GenCam is an IPC standard used to encapsulate the design of printed circuit board and printed circuit board assembly products in a generic manner. Information about tooling, manufacturing, assembly, inspection, and test can all be included in a GenCam file by designers.

SRFF is a SMEMA standard that is expected to become the preferred method for developing electronics manufacturing equipment process control files that are vendor independent. By making use of SRFF, generic programs can be developed which will soon run on a multitude of different machines. This platform independence offers several advantages: improves portability, fosters rapid tool development, minimizes the number of programs per product, and simplifies mixed-vendor assembly line.

By making use of GenCam and SRFF, an enterprise can transfer data from idea to production in a standard manner. GenCam can be used as the output of design and the input to CAM, and SRFF can be used as the output of CAM and the input to machine programming.

**Other highlights in the course**

In addition to lecture style discussions, this course will feature activities unique to this short course.

- Live demos in our CBAR SMT line that show the characteristics of a SECS/GEM interface
- Opportunity for hands-on experience developing applications related to SECS/GEM interface using commercial software packages
- On-site vendor demonstrations by software companies and equipment vendors to provide one-stop shopping

For more information regarding course content feel free to contact Dr. Chen Zhou via e-mail at chen.zhou@isye.gatech.edu or call (404) 894-2326. Visit our web site at www.conted.gatech.edu
Instructors

Dr. Chen Zhou is an Associate Professor in the School of Industrial and Systems Engineering at Georgia Institute of Technology (also known as Georgia Tech). Dr. Zhou was the key person in the development of equipment interface and process control in the circuit board assembly line in the Center for Board Assembly Research (CBAR) at Georgia Tech. He collaborates with several board assembly manufacturers such as NCR, Scientific-Atlanta, Photocircuit, and Chrysler. He has offered this short course twice and instructed SECS/GEM in his Georgia Tech classes for two years.

Andrew Dugenske is the Manager of Research Services at Georgia Tech’s Manufacturing Research Center where he has been leading Industry-funded projects in the area of electronics assembly for the past five years. He is a SMEA Board of Directors member, the SMEA SRFF task force leader, a Representative to IPC, and is active with the National Electronics Manufacturing Initiative. He received a B.S. from the University of Illinois, an M.S. from the Georgia Institute of Technology, and is a registered Professional Engineer in the State of Georgia. He will present the GenCam and SRFF portions of the course.

Chris Saso has worked in the semiconductor industry for over eight years. He has an extensive background in factory automation, applying the SECS and GEM communications standards during his work at the equipment supplier Warkins-Johnson. At GW Associates, Saso provides technical support, training, and product requirements generation, currently focusing on Y2K issues and new product development.

Registration

Register by:
Fax: send the registration form along with your credit card information to (404) 894-0925. This line is available 24 hours a day.
or
Phone: (404) 894-2401 between 9:00 a.m. and 4:00 p.m., Eastern time. Have your credit card and your registration form handy to aid in this process.
or
Mail: Georgia Institute of Technology Continuing Education—R
P.O. Box 93686
Atlanta, Georgia 30377-0686
or
E-MAIL: register@conted.swann.gatech.edu
Please include all of the information outlined on the registration form. Also, include the course name, date, number, key code, and method of payment.
or
WORLD WIDE WEB: Register online at
http://www.conted.gatech.edu/other/online_reg.html

After you register, your confirmation letter will be faxed and mailed to you within five business days. Detailed directions and maps will be included with your confirmation. If you register fewer than 10 working days before the program begins and are paying by check, please bring the payment with you on the first day of the program.

The Georgia Institute of Technology reserves the right to cancel a course for any reason, including insufficient enrollment. If a course is cancelled, all registration fees will be refunded or can be transferred to another course.

Course Fee

The course fee of $895 includes all necessary classroom materials. We accept checks made payable to Georgia Tech, or VISA, MasterCard, American Express, or Discover cards. Many courses have limited enrollment and fill quickly. Register early to ensure your place in this program. Please remit payment no later than 10 days prior to the course start date. Advance payment arrangements are required to guarantee your place in the class.

Course Location and Accommodations

This course will be held at the Manufacturing Research Center located at 813 Ferst Drive on the Georgia Tech campus.

A block of rooms has been reserved at the Holiday Inn Express, which is located at 244 North Avenue, Atlanta, Georgia, adjacent to the Georgia Tech campus. Mention that you are attending a Georgia Tech program for a special room rate. For hotel reservations, call (404) 881-0881.

Course Times

This course starts at 8:30 a.m. and ends at 5:00 p.m. On the final day of the program, the course ends at 5:00 p.m.

Travel Discounts

Delta Air Lines offers special fares to attendees of Georgia Tech programs. Certain restrictions may apply. For information and reservations, call 1-800-241-6760 and refer to file 123282A (for domestic flights only). We recommend that you do not purchase a nonrefundable airline ticket.

Continuing Education Units

This program meets the criteria for the nationally accepted Continuing Education Unit (CEU). Each participant completing the course successfully will earn 1.2 CEUs. You may request a certificate of completion showing the number of CEUs you have earned by calling (404) 894-8305.

Cancellations and Refunds

To cancel your registration and receive a full refund, you must call Continuing Education at (404) 894-2401 at least 10 business days prior to the course start date. A course cancellation received fewer than 10 days prior to the course start date will be refunded the registration amount, less $50 to cover the costs of materials and facilities. If you do not call Continuing Education to cancel your registration and do not attend the course, you are still responsible for the full registration fee. However, substitutions and transfers can be made at any time.

Schedule and Outline

In order to satisfy different types of participants, the course will provide demonstrations and optional hands-on opportunities.

Day 1
8:30 a.m.
Registration
Welcome and overview
10:00 a.m.
SECS-I, HSMS

11:00 a.m.
SECS-II, Demo overview
1:00 p.m.
SMT line control demo
2:00 p.m.
GenCam
3:00 p.m.
SRFF

Day 2
8:30 a.m.
GEM
9:30 a.m.
Equipment implementation
10:30 a.m.
Applications in SMT
11:30 a.m.
Cost/benefits
1:00 p.m.
Summary
2:00 p.m.
Breakout sessions
Vendor software demo, SECS/GEM tools, SMT applications, Application development, SRFF exercise, General discussions
4:00 p.m.
Wrap-up

Course Outline

Day 1
Welcome and overview
Wrap-up

Day 2
SECS-I, HSMS
SECS-II, HSMS
SECS-II, Demo overview
SMT line control demo
GenCam
SRFF
GEM
Equipment implementation
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Wrap-up
IE-120 Interfaces in Circuit Board Assembly
SECS/GEM, SRFF & GenCam

March 24-25, 1999 (x25-139)  October 6-7, 1999 (x27-275)

PLEASE PRINT CLEARLY

Name:__________________________________________________________

*Social Security #:_______________________________________________

Position:________________________________________________________

Organization:____________________________________________________

Address:________________________________________________________

(Registration confirmation will be sent to this address)

City:___________________________________________________________

State:_________________________ ZIP:_______________________________

Daytime phone #:____________________ FAX #:_______________________

E-mail:_________________________________________________________

Are you a Georgia Tech graduate?  Yes  No  

Course Fee: $895

Check enclosed (payable to Georgia Tech)

Charge:  American Express  VISA  MasterCard  Discover

Card #:________________________________________________________

Exp. Date:______________________________________________________

Cardholder’s Name:______________________________________________

Signature:_______________________________________________________

How did you hear about the course?

brochure  web  radio  magazine ad  co-worker  other

*Social Security numbers are required for Life Long Learning Tax Credits.

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