**Advanced Monitoring System (AMS)**

for process control

by Günther Ahring, Dr. Boris Morgenroth, Stefan Pfau and Björn Köllmann

**AMS - Objectives**

- AMS is a software tool processing data of the Process Data Acquisition System (PDAS) & laboratory system to complement the condition and performance monitoring.

- AMS is based on standard, industry accepted and proven software: Sugars®: Process modelling software

- AMS is an integrated online mass-, energy and colour balance of the process based on the Sugars® program.

- Approx. 100-150 input variables are necessary compared to up to 3,000 values recorded by the processing system and in the laboratory to model the process.

**AMS - Targets**

Consistent mass-, energy and colour balance of the process to transparent factory.

Equipment performance is directly shown.

AMS based on processing modules -- avoids mathematical (connection)-errors.

System is fully open and programmable -- limited manufacturer reliance.

Easy handling & training for „non-graduates“ e.g., control terminal staff.

Quick and easy adaptation of the factory model in case of changes in the process scheme.

**AMS - Summary**

- Basis for future expert systems

- Sugars®/AMS offers an excellent process overview

- Reconciliation of process values versus the Sugars®/AMS calculation

- Reduction of process automation and control equipment

- Maintenance and personnel cost reduction

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**Figure 1: Sugar house simulation model**

**Figure 2: Simulation model of an evaporation station**

**Figure 3: Key Performance Indexes (KPI) of chosen equipment**

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SIT CONFERENCES

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**Key benefits of Sugars™ and AMS**

- Simple and clear visualisation of the process.
- All important physical medium properties are already included.
- Process is simulated on the basis of individual station models.
- Mathematical connection errors can not occur in comparison to Excel spreadsheets.
- Time to create and to modify a balance of a factory is much shorter than with other tools.
- The process connections can easily be rearranged on the screen.
- A colour balance can be included and the product quality can be determined.
- "On line" comparison between measured values and calculated values.
- Determination of bottlenecks in the factory.
- Modelling and simulation allow rapid evaluation of each alternative to arrive at process and/or equipment changes that can reduce the energy consumption of a factory.
- Research and Development (R&D) projects can be modelled and simulated before funds are committed.
- Sugar yield can be increased by process and/or equipment changes.

**AMS - References**


Morgenroth, B., Weiss, W., 2003: Advanced Monitoring Systems for Process Control, CITS in Madrid, 18 to 21 May 2003, Verlag Dr. Albert Bartens, 212-130. (can be downloaded at [www.SugarsOnline.com](http://www.SugarsOnline.com))


**Contacts**

**IPRO Industrieprojekt GmbH**
Dr. Boris Morgenroth
Celler Straße 67, 38114 Braunschweig
Germany
Phone: + 49 531 / 590 03 24
Fax: + 49 531 / 590 03 45
Email: Morgenroth@ipro-bs.de
Homepage: www.ipro-bs.de

**Sugars International LLC**
Mr. Warner Weiss
30 Glenmoor Drive, Englewood, CO 80113-7115
USA
Phone: + 303 / 761 - 8442
Fax: + 303 / 761 - 8048
Email: WWeiss@SugarsOnline.com
Homepage: www.sugarsonline.com

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