

# Advanced Monitoring System (AMS) for process control

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

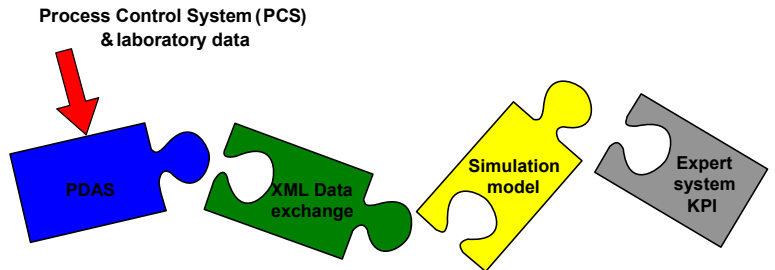


IPRO Industrieprojekt GmbH  
Celler Straße 67, 38114 Braunschweig,  
Germany

Phone: + 49 - 531 / 590 03 - 0  
Fax: + 49 - 531 / 590 03 - 45  
ipro@ipro-bs.de www.ipro-bs.de

## AMS - Objectives

- AMS is a software tool processing data of the Process Data Acquisition System (PDAS) & laboratory system => complementary link between condition and performance monitoring.
- AMS based on standard, industry accepted and proven software: Sugars™: Process modelling software; Visio®: Process visualization software
- AMS is an integrated on-line 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 => 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.

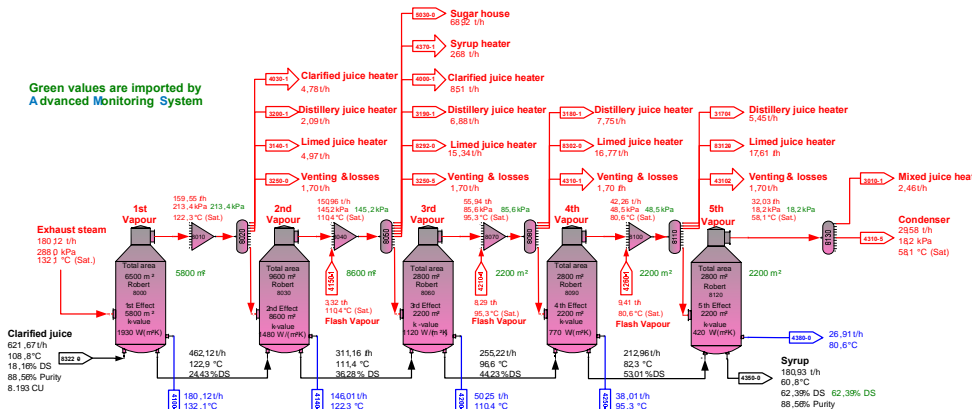


Figure 2: Simulation model of an evaporation station

## 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

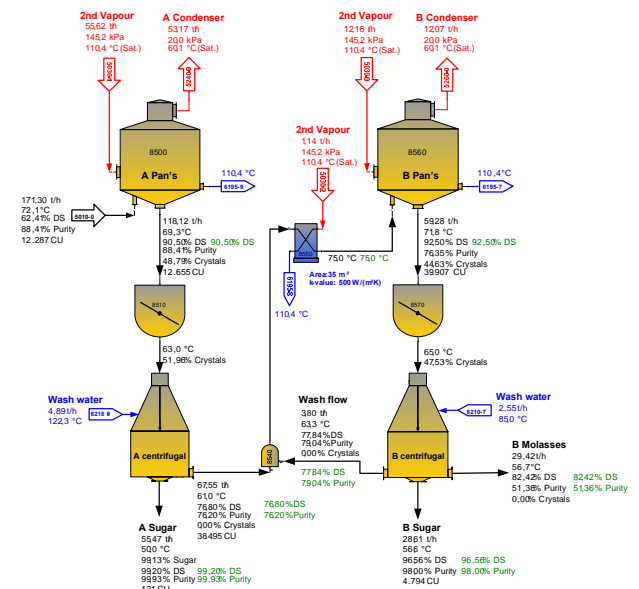


Figure 1: Sugar house simulation model

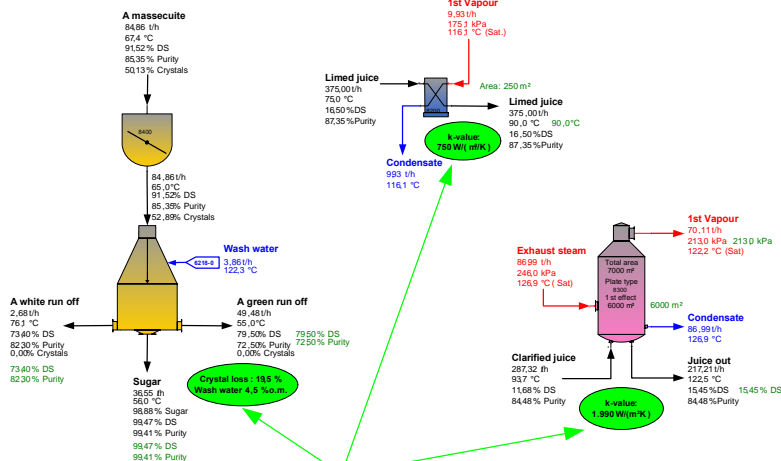


Figure 3: Key Performance Indexes (KPI) of chosen equipment



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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.

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## AMS - References

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## 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](mailto:Morgenroth@ipro-bs.de)  
Homepage: [www.ipro-bs.de](http://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](mailto:WWeiss@SugarsOnline.com)  
Homepage: [www.sugarsonline.com](http://www.sugarsonline.com)



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