

# aXbatch

aXbatch – a S88 batch system with revolutionary integrity

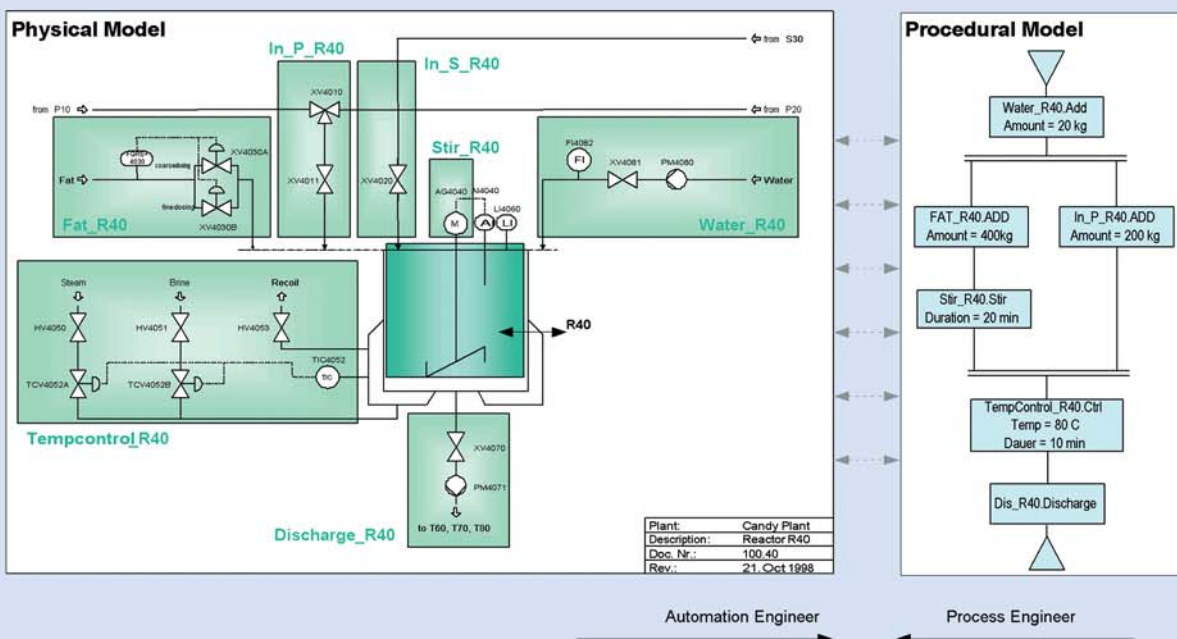


## General advantages of S88-systems:

- standardized Models and Terms
- unlimited Flexibility in multi-functional facilities: S88 allows for changing the process without changing the automation system!
- allows Parallel Engineering of automation- and process engineers (clear separation of basic automation and process automation)
- standardized Recipe Management
- standardized Production Information Management
- well defined interfaces to ERP-systems
- support of General Recipes: equipment and site independent process definition for large companies (manufacturing of one and the same product at multiple sites)

## Additional advantages of aXbatch:

- Control-, SCADA-, and Batch system within one User Interface and one Database
- significant Reduction of Engineering and Operating Costs (up to 60 percent)
- elimination of Phase-Logic-Interface (PLI) through integrated system approach
- designed for 21 CFR part 11 (electronic records and electronic signatures)
- Redundant System Architecture (option)
- integrated Scheduler and Campaign Manager
- extremely High Performance (start time of phases < 300 ms)



S88-systems are built on a physical and a procedural model. Whereas the physical model describes the process resources, the procedural model describes the process itself. Automation engineers only implement basic functions (so-called phases) which are linked to elementary physical modules. Process

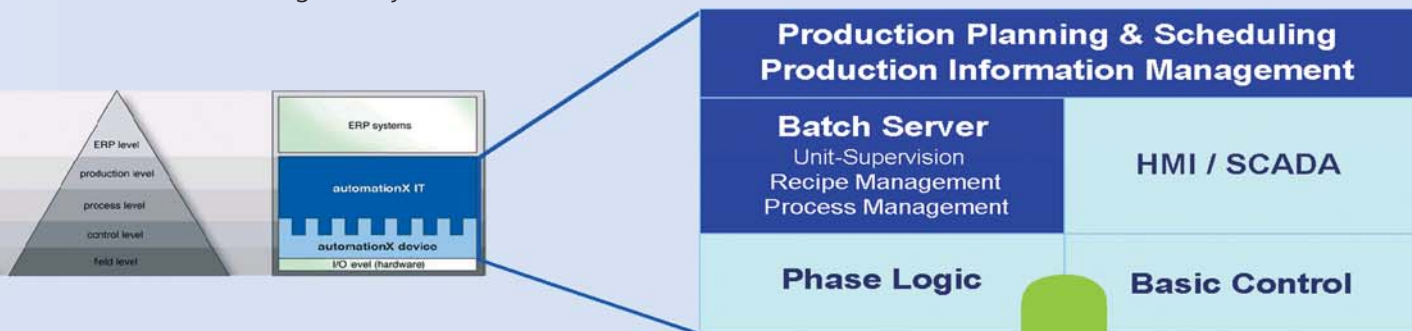


## aXbatch – a S88 batch system with revolutionary integrity

For the world's leading food, pharmaceutical, and chemical companies compliance with the international ANSI/ISA-S88 standard is already a must. S88 for the first time puts all important activities of batch based manufacturing processes – from basic machine control to production planning - under the umbrella of one single model.

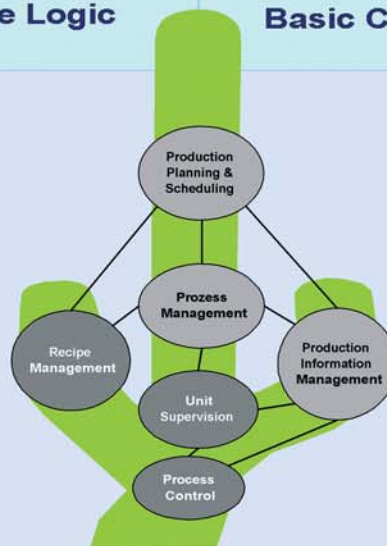
Although the standard was originally designed for batch processes the overwhelming success since the publication in 1995 puts the S88 model now into the spotlight of various industries including discrete and continuous manufacturing processes. Today only presumably high costs prevent many companies from implementing S88 compliant systems.

The difficulties with S88-systems always were high integration costs. aXbatch eliminates this problem by putting S88 homogenously into the context of the automationX technology, which already includes a Control-, a SCADA, and a Production Management System.



*aXbatch is homogenously integrated into the automationX technology. Within automationX S88 specific software components like Phase Logic, Unit Supervision, and Recipe Management are available alongside with state-of-the-art modules such as SCADA, Soft-PLC and Production Management. The revolutionary idea behind aXbatch is that everything comes within one single user interface and one single database. This approach eliminates integration costs of traditional systems and such reduces both, engineering and operating costs by up to 60 percent.*

*The so-called Cactus Model defines activities and functions in S88-systems. aXbatch achieves to integrate all of them into one single software package.*





## AutomationX Technology: An ideal platform for the S88-concept

The screenshot displays the 'aX Viewer demo: Food Demo / Page 2 - Screening' interface. The main window shows a detailed process flow diagram for 'Screening of Raw Materials'. The process involves several stages:

- Major Ingr. from Railcar:** Three large silos labeled 'SUGAR', 'FLOUR 1', and 'FLOUR 2' (TQ-101, TQ-102, TQ-103) receive input from railcars.
- Minor Ingredients:** Two smaller silos labeled 'CornMeal' and 'CornFlour' (TQ-104, TQ-105) receive input from railcars.
- Processing:** The materials pass through blowers, a lump breaker, metal detectors, and sifters.
- To Scale Hopper & Mixer #1:** The processed materials are directed to a hopper and mixer.

The interface includes a menu bar (File, Edit, View, Alarm, Batchmanagement), a toolbar with navigation and control icons, and a sidebar with a tree view of the process structure. A 'Parameter - Reports - Phase Interface' window is open, showing a 'Reference' diagram and various control parameters. A 'running\_action' window is also visible, displaying a graph of 'Flow Rate' and 'Material' levels, along with control logic for 'lock Measurement' and 'calculate act value'.

aXbatch allows the integration of Basic Control, Alarming, HMI, and Phase Logic into so-called Automation Classes. These classes represent Technology Modules including the interface to the batch server and – because of aX's object oriented approach - can be used multiple times.



## Production Information Management de luxe

**Scheduler**

Nr.	Recipe	Unit	Status	Procedure_State	Batch Size	Engr Unit	Parameter	Parameter_Value	Priority	Batch_ID	Start_Condition	Initial_Mode	Start_Time
1	2200	ProcessCell	Schedule_Hold	Idle	4200.00	Ziel	Fertigstellung	1	20030409142059(198)	SequentialConditional	Automatic		
2	2200	ProcessCell	Schedule_Hold	Idle	4200.00	Ziel	Fertigstellung	1	20030409142100(199)	SequentialConditional	Automatic		
3	2201	ProcessCell	In-progress	Running	1000.00	Ziel	LKW1	1	20030428180331(1)	None	Manual		
4	2201	ProcessCell	In-progress	Running	1000.00	Ziel	LKW1	1	20030428180332(2)	None	Automatic		
5	2231	ProcessCell	Scheduled	Idle	2000	ZIEL	LKW1	1	20030428180434(5)	None	Manual		
6	2203	ProcessCell	Scheduled	Idle	1500	Ziel	LKW2	1	20030428180602(7)	Time/Date	Automatic		2003-04-28T19:00
7	2203	ProcessCell	In-progress	Held	2000	Ziel	LKW1	1	20030428180635(8)	None	Manual		
8	2204	ProcessCell	Scheduled	Idle	1000	Ziel	LKW1	1	20030428180723(9)	Sequential	Automatic		

Nr.	Recipe	Unit	Status	Priority	Start_Time	End_Time	Batch_ID	Campaign_ID	Product_ID	Order_ID	External_ID	Entry_Type
1	2203	ProcessCell	Aborted		2003-04-28 18:03:43	2003-04-28 18:05:24	20030428180334(4)					

**Unit Overview**

Unit: [ ]  
 Date from: 28.01.2003  
 Date to: 29.01.2003

**Scheduler Options**

Start Mode: Automatic  
 Start Condition: None  
 Start Time: 28.01.2003  
 Priority: 1

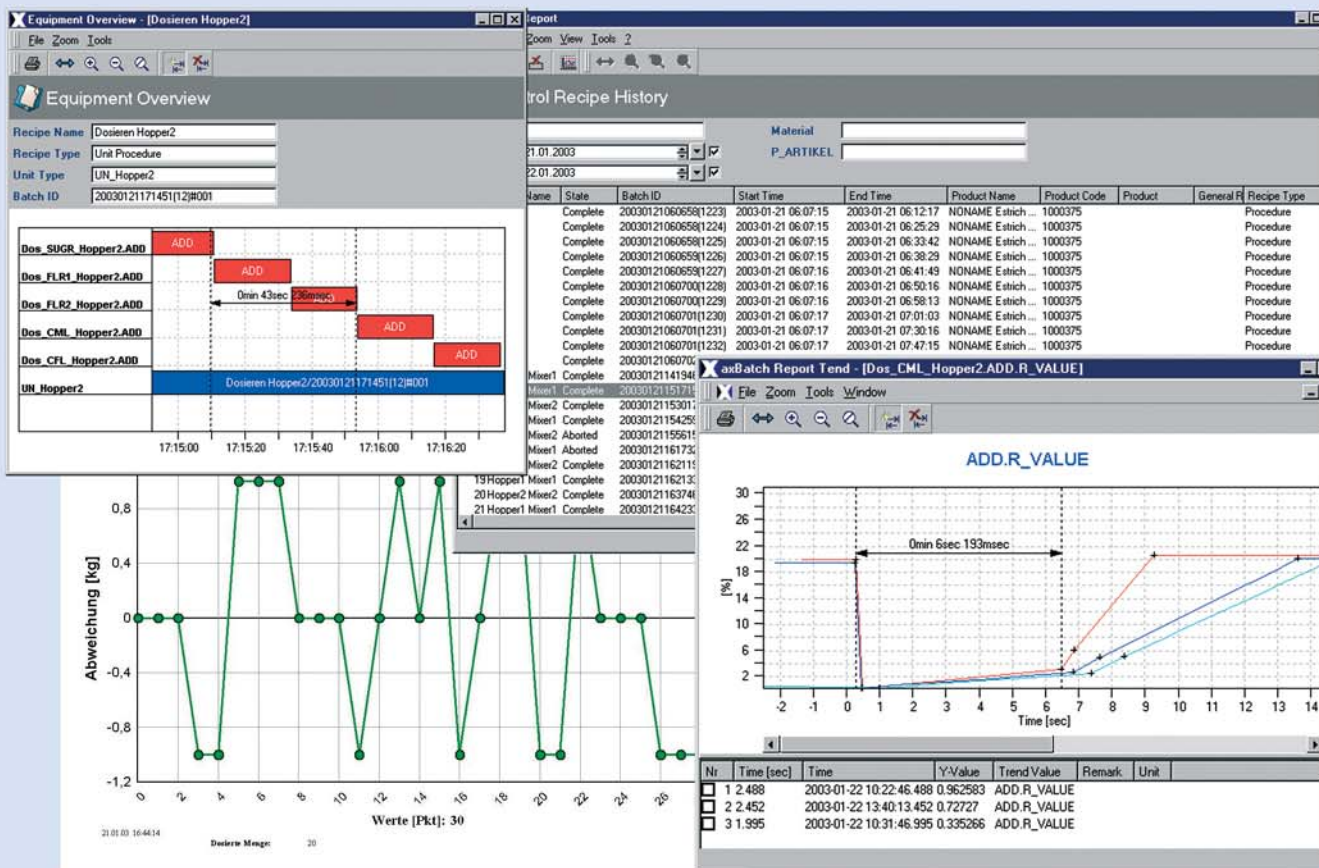
**Campaign Parameter**

Campaign Amount: 40000  
 Select Batch Size: Minimum (1000), Default (1000.00), Maximum (4200), User, Calculated (40000)  
 Batch Count: [ ]  
 Allow a single odd size

aXbatch provides many functions which are linked to the IT-related topics of S88. Already the standard version of aXbatch contains a Production Scheduling Module which can be easily linked to ERP-systems (e.g. SAP) or also work on its own.



## aXbatchReport: production information management de luxe



aXbatchReport is the ideal counterpart of aXbatch. With this tool quality and resource management is always under control. Based on an Oracle database it also provides the openness for customer specific extensions.

Beside others the following reports are available:

- Detailed Batch History
- Material Consumption
- Utilization of Process Resources
- Material History
- PLC-synchronous Trending of Phase Variables





## aXbatch - Designed for 21 CFR part 11

Batch History

Show History for date: 15.04.2003

Nr.	Recipe	Start_Time	End_Time	Batch_ID	Campaign_ID	Priority	Batch Size	Batch Size Max	Engr_Unit	Recipe Type
1	Hopper2 M	2003-04-15 11:45:59	2003-04-15 11:50:57	20030415114558(143)			100	5000	kg	Procedure
2	Hopper2 M	2003-04-15 11:41:01	2003-04-15 11:45:58	20030415114100(142)			100	5000	kg	Procedure
3	Hopper2 M	2003-04-15 11:36:03	2003-04-15 11:41:00	20030415113602(141)			100	5000	kg	Procedure
4	Hopper2 M	2003-04-15 11:31:04	2003-04-15 11:36:02	20030415113104(140)			100	5000	kg	Procedure
5	Hopper2 M	2003-04-15 11:26:05	2003-04-15 11:31:03	20030415112605(139)			100	5000	kg	Procedure
6	Hopper2 M	2003-04-15 11:21:07	2003-04-15 11:26:04	20030415112106(138)			100	5000	kg	Procedure
7	Hopper2 M	2003-04-15 11:16:09	2003-04-15 11:21:06	20030415111608(137)			100	5000	kg	Procedure
8	Hopper2 M	2003-04-15 11:11:10	2003-04-15 11:16:08	20030415111110(136)			100	5000	kg	Procedure
9	Hopper2 M	2003-04-15 11:06:12	2003-04-15 11:11:09	20030415110611(135)			100	5000	kg	Procedure
10	Hopper2 M	2003-04-15 11:01:09	2003-04-15 11:06:11	20030415110109(134)			100	5000	kg	Procedure
11	Hopper2 M	2003-04-15 10:56:11	2003-04-15 11:01:08	20030415105611(133)			100	5000	kg	Procedure
12	Hopper2 M	2003-04-15 10:51:13	2003-04-15 10:56:10	20030415105112(132)			100	5000	kg	Procedure
13	Hopper2 Mixer2	2003-04-15 10:46:14	2003-04-15 10:51:12	20030415104614(131)			100	5000	kg	Procedure
14	Hopper2 Mixer2	2003-04-15 10:41:16	2003-04-15 10:46:13	20030415104116(130)			100	5000	kg	Procedure
15	Hopper2 Mixer2	2003-04-15 10:36:18	2003-04-15 10:41:15	20030415103617(129)			100	5000	kg	Procedure
16	Hopper2 Mixer2	2003-04-15 10:31:20	2003-04-15 10:36:17	20030415103118(128)			100	5000	kg	Procedure
17	Hopper2 Mixer2	2003-04-15 10:26:22	2003-04-15 10:31:19	20030415102621(127)			100	5000	kg	Procedure
18	Hopper2 Mixer2	2003-04-15 10:21:23	2003-04-15 10:26:20	20030415102122(126)			100	5000	kg	Procedure
19	Hopper2 Mixer2	2003-04-15 10:16:25	2003-04-15 10:21:22	20030415101624(125)			100	5000	kg	Procedure

28.04.2003 18:24:37 admin Running aut-log-09

The famous 21 CFR Part 11 establishes the criteria under which electronic records and signatures will be considered equivalent to paper records and handwritten signatures in manufacturing processes regulated by the Food and Drug Administration of America (FDA).

The benefits of electronic signatures and record keeping are significant. It increases the speed of information exchange and advanced searching capabilities, reduces the cost of record keeping storage space, increases data integration and trending information, improves product quality and consistency, and reduces vulnerability of signature fraud and report misfiling.

**Packaged software itself cannot be "compliant"; it is the application that one creates with the packaged software that can become Part 11 compliant.**

**However aXbatch is designed with Part 11 in mind, and has built-in tools for capturing electronic signatures and creating secure electronic records.**

Beside other features aXbatch provides:

- 21 CFR part 11 compliant User Management
- Signature/Record-Linking
- Audit Trails (e.g. for batch protocols)



# The automation operating system.



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Controlling. Operating. Monitoring.  
With just one software-package.

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