

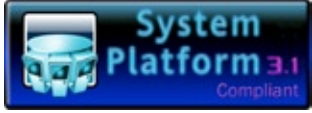


# InBalance for Wonderware

## Data Validation and Mass Balance Module for Wonderware System Platform

- pipeline and process flow management with data (mass/volume/flow) consolidation
- detection of leakages and measuring errors
- pressure drop analysis based leak location detection in gas pipelines
- configurable module, easy to use
- integrated in Wonderware System Platform





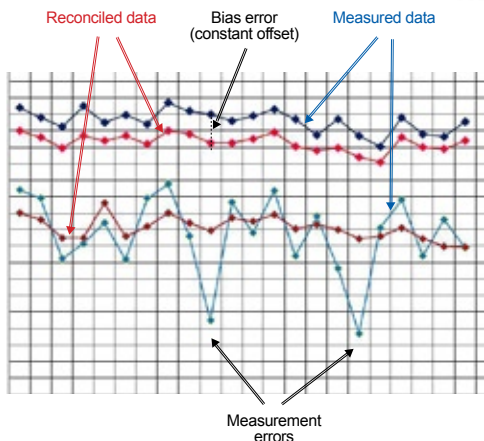
# InBalance – Data Validation and Mass Balance Module for Wonderware System Platform

**Easy to use, modular and integrated solution for data reconciliation and mass balance calculation. Pipeline and process flow management. Leakage detection.**

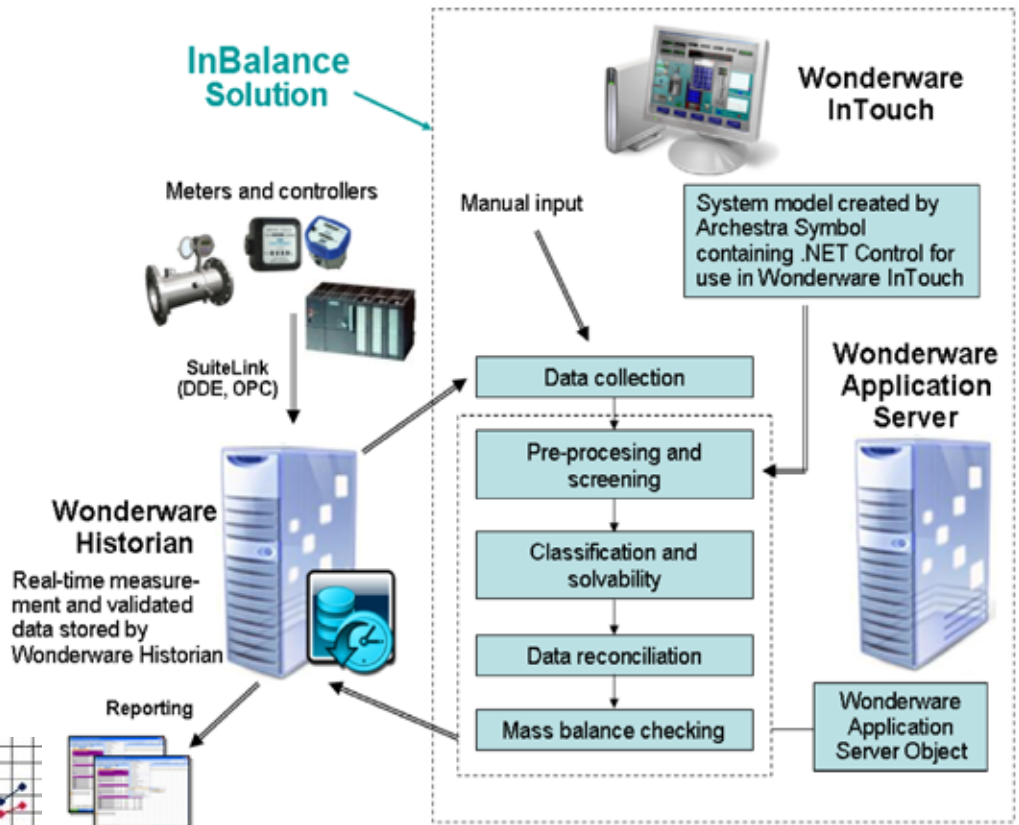
**InBalance – Data Validation and Mass Balance Module, provides a modular and integrated in Wonderware System Platform solution for data reconciliation/validation and mass balance calculation, allowing easy integration to existing and new projects.**

*InBalance solution is integrated in Wonderware System Platform:*

The main function of InBalance is to solve basic needs in steady-state and dynamic mass balancing systems where it is necessary to transform raw process data (usually a subject for measurement errors and deviations) to more precise data, calculate unmeasured data wherever it is possible and detect measurement failures, leakages and production losses.



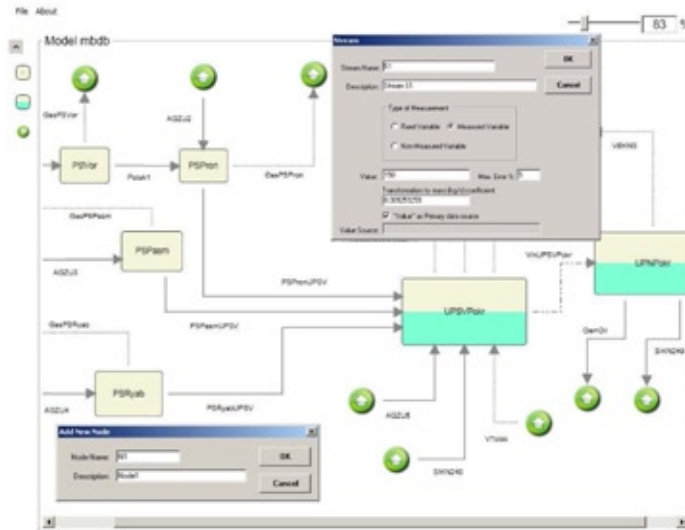
*The reconciled data is more precise, error free and reliable as raw measured data*



## FEATURES

The system model consists of nodes connected by streams of material. Typical nodes are technological facilities, tanks, apparatuses or their parts, connections or disjoints of pipes. Streams are process streams of material, characterized by flow rate.

For each project the “nodes/streams” system model is created by using a **Model Editor** (special drawing tool), implemented as Archestra Symbol containing .NET Control for use in Wonderware InTouch or Application Server. This .NET Control allows to draw and create a model consisting of nodes and streams and configure their parameters:



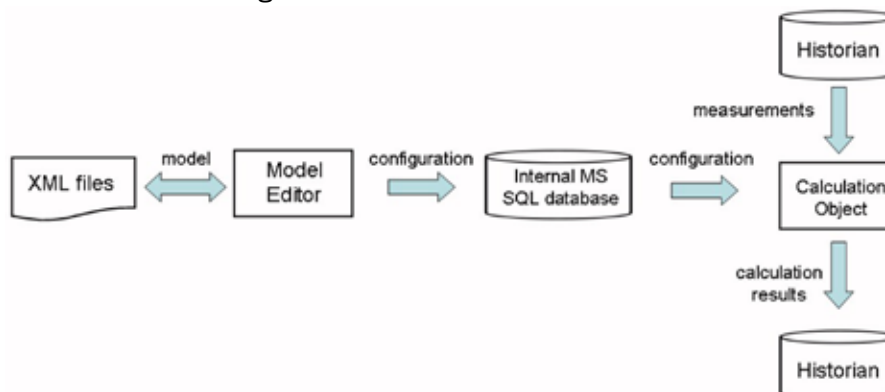
Both measured raw data and manually entered values can be used as input data sources.

The Wonderware Historian is used both as a source of raw data and as a target place for reconciled/validated and balanced results for further reporting and data export.

The data validation/reconciliation and mass balance calculation is performed by specially developed Wonderware Application Server **Calculation Object**, where the following main tasks are performed:

- pre-processing and screening of input data to remove evident gross errors and mistakes;
- automatic data classification and determination of solvability;
- data reconciliation by using least squares method to calculate reconciled values and their confidence intervals and calculate the values that cannot be measured;
- checking of mass balance in purpose to find leakages, measurement errors or storages not defined in the model;
- calculation of gas volume balance, taking into account pressure, temperature and molar mass;
- pressure drop analysis based leak location detection in gas pipelines.

InBalance general data flow is the following:



The system model created in Model Editor is saved as .XML file and also written to internal MS SQL database, used as internal interface between Model Editor and Calculation Object.

InBalance solution is deeply integrated in Wonderware environment and InBalance security level is same as implemented in Wonderware Archestra IDE and Wonderware Historian. Additionally InBalance supports **audit trail**

functionality, with ability to generate reports showing who has accessed InBalance system and what operations were performed during a given period of time, and **anti counterfeit** functionality, implemented as digitally signed InBalance Dynamic Link Libraries.

## APPLICATIONS

Continuous flow process management for pipelines like oil/gas/chemical pipelines, central heating pipelines and water pipelines. Data validation and mass balance calculation simplifies the detection of imbalances, leakages, measuring failures and non-optimal operation in pipeline and process flow management. The production data become more error free and consistent, thus improving the overall production reliability.

Start date/time: 2/26/2010 12:00:00 PM		End date/time: 2/26/2010 1:00:00 PM		Total volume, m3				Deviation between reconciled and measured data			
12	13	Measured			Reconciled	Reconciled	m3		%		
		Input	Output	Disbalance			Accumulated	Input	Output		
14	All System	6.25	4.58	0.00	1.75	4.58	1.75	1.80	27.04	0.02	0.44
15	Nodes:										
17	Pump	6.25	6.25	0.00	6.2	6.2	0.05	0.80	0.03	0.47	
18	Tank	6.25	4.58	0.00	1.75	4.58	1.75	2.91	32.96	0.02	0.44
19	Streams:										
20	S1	6.25				6.2					
21	inlet	6.25				6.2					
22	S2		4.58			4.58					
23											
24											
25											
26											
27											
28											
29											
30	All System	5000	3066.67	66.67	1433	3644.42	1396.95				
31	Nodes:										
32	Pump	5000	5066.67	66.67		5041.37					
33	Tank	5066.67	3066.67	0.00	1433	3644.42	1396.95				
34	Streams:										
35	S1	5000				5041.37					
36	inlet	5066.67				5041.37					
37	S2		3066.67			3644.42					



The integration in Wonderware System Platform enables wide selection of measured data sources and interoperability with other Wonderware software for reporting and data export purposes.

## ORDERING INFORMATION

InBalance licensing is based on total number of system model streams used in deployed Calculation Object(s) on one computer. The following is available:

### Description

- InBalance Module, up to 3 streams
- InBalance Module, up to 10 streams
- InBalance Module, up to 50 streams
- InBalance Module, up to 100 streams
- InBalance Module, more than 100 streams

### Order Number

- free of charge
- PR00160**
- PR00161**
- PR00162**
- PR00163**

*InBalanceDS\_en\_0211*



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