APURES ®

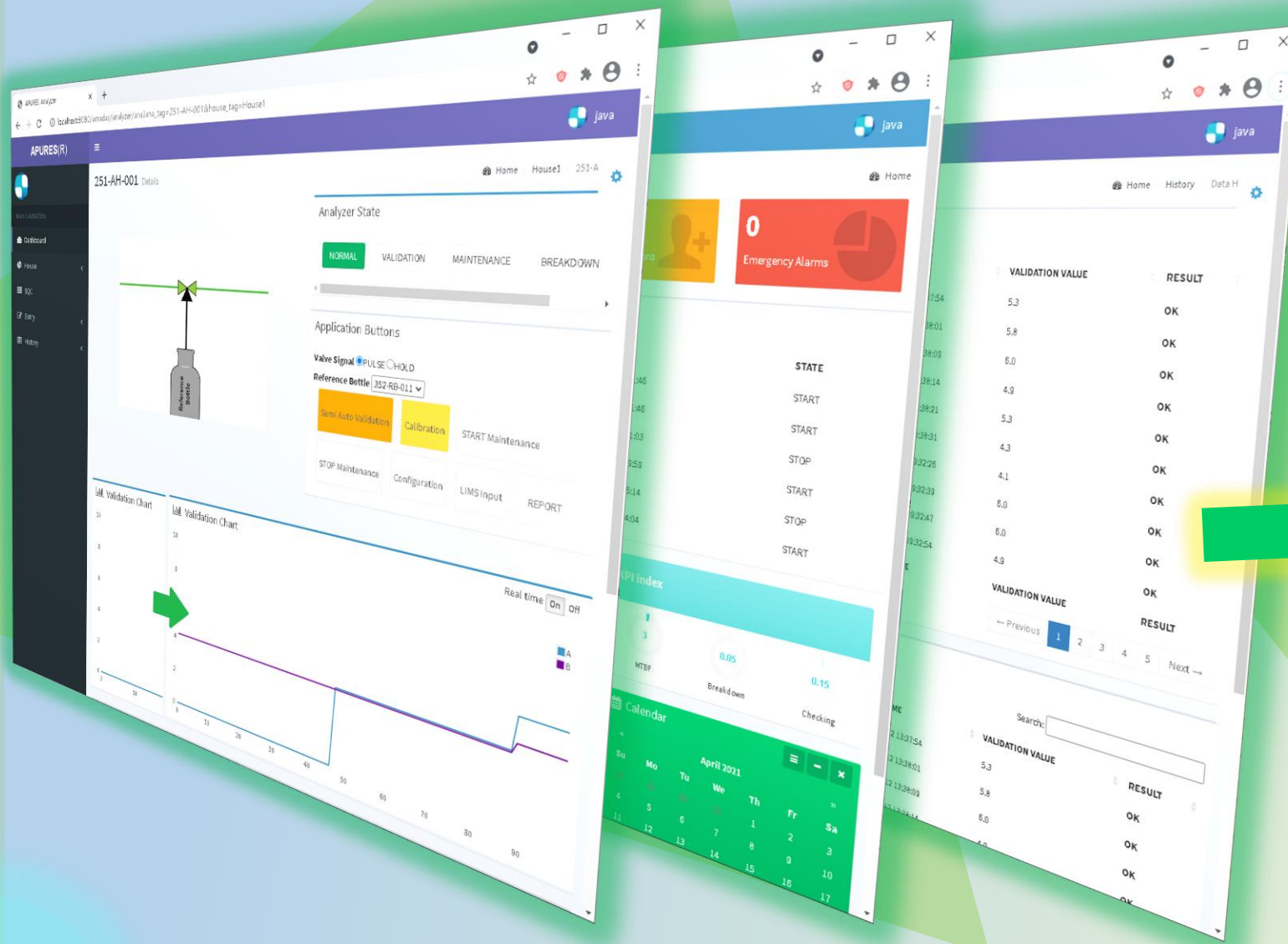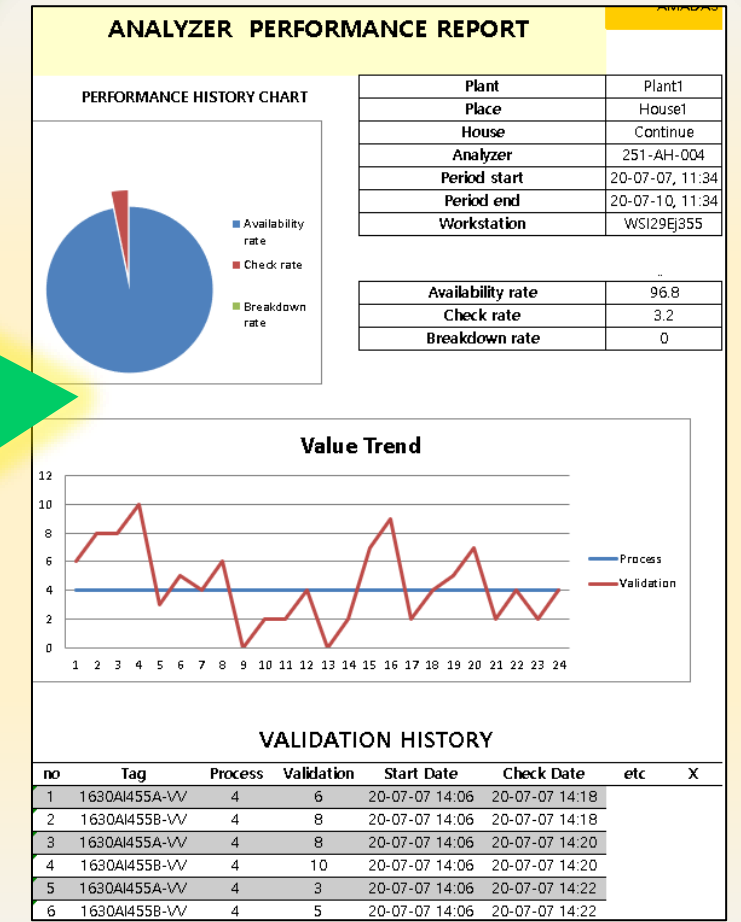## ANALYZER PERFORMANCE UTILIZATION RESEARCH AND EVALUATION SYSTEM

APURES® is Efficient Analyzer Performance Investigation and Fault Assessment System, which provides high-speed problem probing and fault forecasting function, covering from simple gas meter to sophisticated Gas Chromatograph equipment and optical component analyzer deployed in the process line of refinery and chemical process complex.

APURES® enhances the speed and efficiency of system integrity performance and maintenance activity in process control and trouble-shooting managed by human resources, by computerizing investigation procedures for forecasted line failure, and detecting abnormalities by automated scenarios, minimizing the revenue damage in the least of time.

APURES® is AMADAS Solution of Wellas® created for petrochemical, refinery and energy conversion industries, providing enhanced system performance forecast and executing counter-maintenance in one step ahead before facility failure.
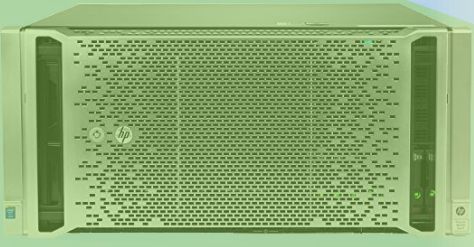
SINGLE ANALYZER STATUS REPORT

APURES ®

FEATURES : HARDWARE

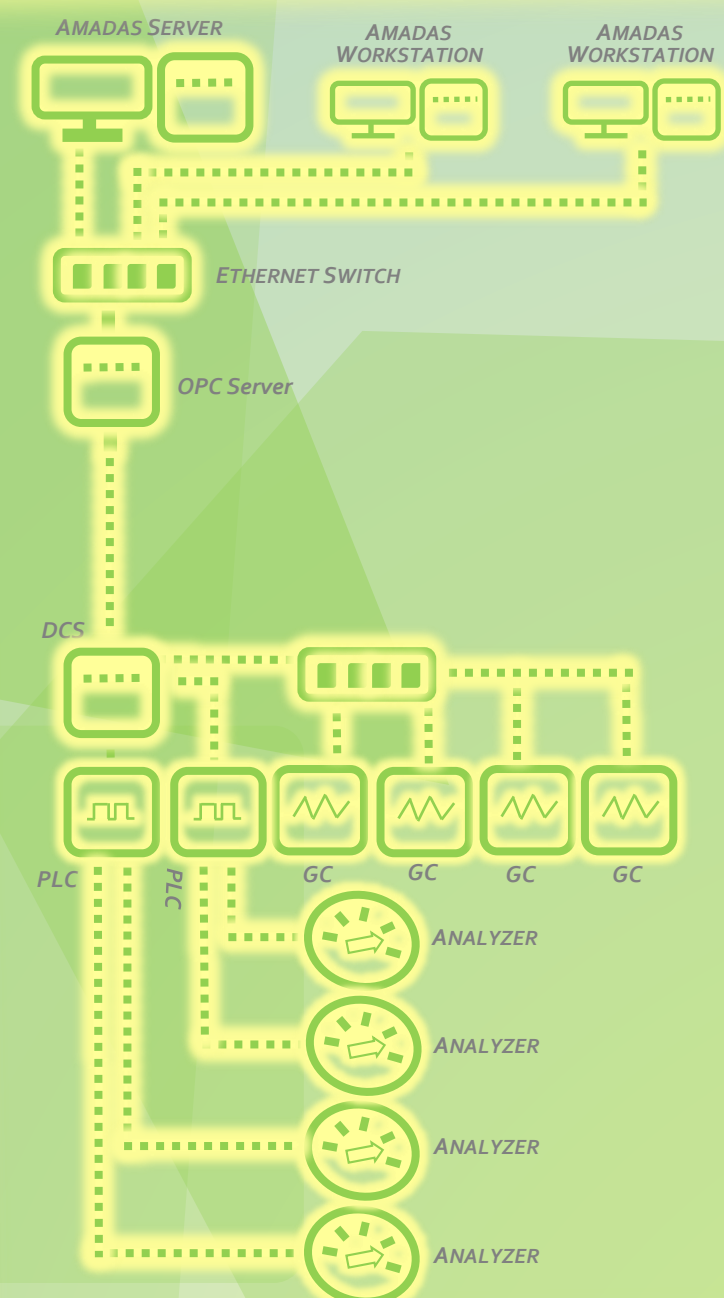### SERVER Hardware Sample (simultaneous connection user account more over 10)

MODEL	HP 776978S01 ProLiant ML350 G9 5U
INSTALLATION TYPE	Tower 5U
CPU	Intel Xeon E5-2640V3 / 2.6 GHz
CACHE PER PROCESSOR	20 MB
NUMBER OF CORES	8 CORES
CPU QUANTITY	2
INSTALLED RAM	DDR4 SDRAM Advanced 16 GB
FRONT ACCESSIBLE BAYS	1
VIDEO	Matrox G200 / VGA Connector
MONITOR	21 INCH TFT
HDD	8 TB
RAID LEVEL	RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 60, RAID 1 ADM, RAID 10 ADM
ETHERNET	4 x Gigabit Ethernet Controller: HP 331i
POWER REDUNDANCY	Yes (1+1)
NOMINAL VOLTAGE	AC 120/230 V (50/60 Hz)
POWER PROVIDED	800 Watt

Hardware option method

- The hardware could be freely ordered.

- we will supply good hardware that is considered capability.

- if the customer wants to the OPC server, Of course, we can supply it.

- if the APURES has to connect a lot of analyzer, the hardware spec will be going up.

- The APURES server hardware has primary Database server.

- Secondary Database server also can compose separately hardware.

APURES NETWORK HIERARCHY

APURES SOFTWARE FEATURES

- Industry Standard **OPCUA** Network Interface
- Python 3.9 (Web based)
- Embedded OPCUA Client Module
- Browser is made by JAVA (Web based)
- can use **Modbus TCP/IP** connection
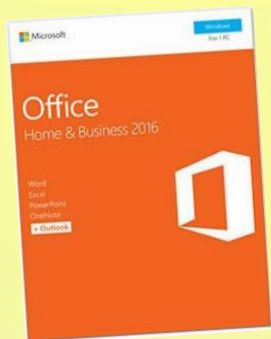
Microsoft Windows Server 2016

- 5 Client License
- Dual CPU Redundancy Support
- Internet Information Server Support
- ASP .NET Support
- Remote Desktop by Virtual Machine

MySQL Server

- Industry Leader in Mission Critical OLTP
- Most Secure Database
- Highest Performance Data warehouse
- End-to-end mobile BI on any device
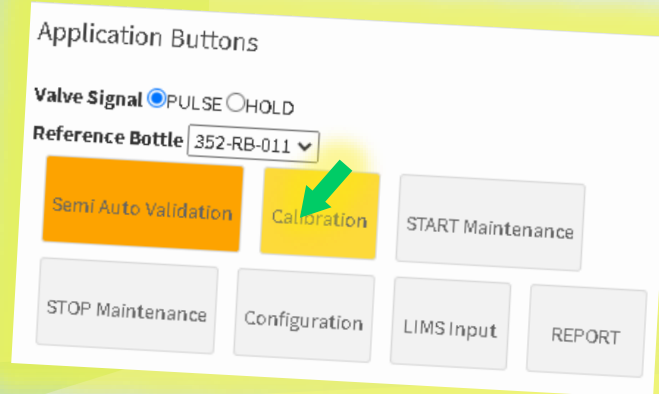- In-database Advanced Analytics

Microsoft Office 2016 Professional

- WORD 2016
- EXCEL 2016
- POWERPOINT 2016
- ACCESS 2016

USER-FRIENDLY GRAPHIC SCREEN INTERFACES

Big buttons and large text characters enhance the visibility of tasks and the content of query tables.

Application Buttons
Valve Signal ⦿PULSE ○HOLD
Reference Bottle 352-RB-011
Semi Auto Validation | Calibration | START Maintenance
STOP Maintenance | Configuration | LIMS Input | REPORT
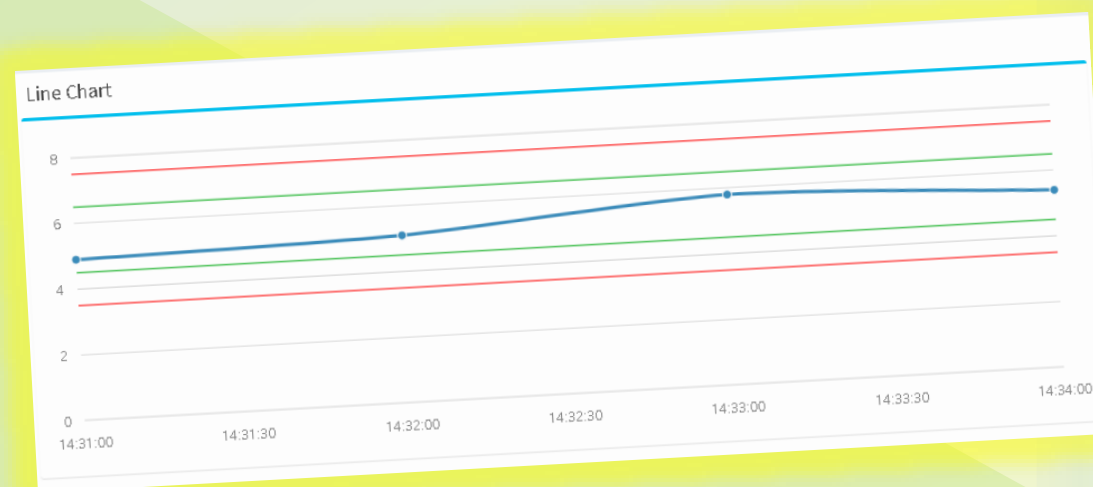
ANALYZER STATUS CONCENTRATION IN REAL-TIME

Multi-thread Ethernet Sockets concentrate the real-time measurements from analyzers and Gas Chromatographs within less than 1 sec delay, ensuring high-quality precision and strict time-frames to achieve considerable accuracy in chart display and measurement logs. The analyzer states kept updated by APURES concentrating thread provides 6 information.

- Normal Operation
- Alarm
- In Maintenance
- In Breakdown
- In Validation
- Analyzer OFF

REAL-TIME ANALYZER QUALITY RULE CHECK)

The quality of analyzer reading is evaluated in real-time, and consequently to the least minimizes the damage caused by the failure of process line as early as possible. Operator can set following 3 assessment parameters for helping to estimate values.
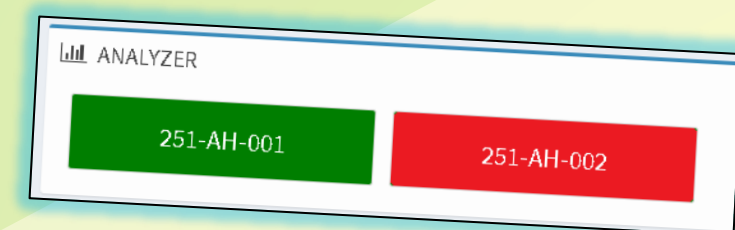
- Control limit Check
- Warning limit Check
- Reference value Check

Line Chart
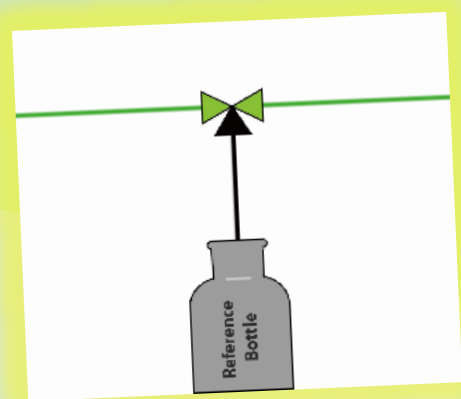
VISUAL ANALYZER STATUS MONITORING

Analyzer state is visualized with colored windows.
Each color indicates the state of analyzer. Visual coloring accelerates the response activity in case of emergent situation in process lines.

- Normal Operation
- In Maintenance
- In Breakdown
- Alarm
- In Validation
- Analyzer OFF

ANALYZER
251-AH-001 | 251-AH-002

GAS CYLINDER MANAGEMENT AND CHART

Reference gas cylinder state is updated in the *simple* diagram. If valve turned on, arrow indicators are shown up and changed the direction of valve. Operator may take action to replace the exhausted reference cylinder once the range of empty in chart is low.

In REFERENCE CYLINDER page, the operator browses the expired gas cylinders to reorder replacement cylinders. Query is executed with the condition specified by search start date/time, search end date/time, plant, house, analyzer, supplier and gas type.

LIMS QUALITY CHECK SUPPORT

APURES Server can be collected LIMS measurement data by Operator. LIMS personnel takes chemical samples from process line and measures with analyzers in LIMS lab. And the measurement readings are entered in LIMS server PC in LIMS lab. Quality check is automatically performed as new LIMS readings are received in APURES server.

WHOLE EVENT AND STATUS LOG

The operator can see the whole event log and status for every GC and analyzers. In ALL EVENT screen, the operator can search the logs as selecting the event date. And there is also individual event log screen.
All event log screens are marked separated color row by row.

Data History advanced tables

EASY CALIBRATION FUNCTION

The operator can calibrate by just click the CALIBRATION button. It make the signal, it is connected the calibration node in OPC server.
So, operator doesn't have to deal with another setting concerning calibration.

LOGIN HISTORY MANAGEMENT

Login history are available for searching in LOGIN HISTORY screen.

ANALYSIS REPORTS GENERATION

ANALYZER PERFORMANCE REPORT

PLANT NAME		
	Document S/N	MBDR1616
	Plant	Plant 1
	Sector	Plant WAHED
	House	House 2
PERFORMANCE HISTORY CHART	Analyzer	251-AH-002
	Period Start	2020-02-06
	Period End	2020-02-06
	Workstation	WSI29EJ35S
	Operator/ Group	ENGINEER 1023
	Print Date/ Time	2020.02.06 16:15
	Availability rate	30%
	Breakdown rate	45%
	Checking rate	25%

VALIDATION HISTORY

NO	DATE	STREAM ID	REF VALUE	VALIDATION	DEV	CTRL LIM	WARM LIM
1	202006/11:22	1-CO2	3,000	3.015	323	PASS	PASS
2	202006/11:22	2-CH4	5,000	5.060	0	PASS	PASS
3	202006/11:22	1-CO2	3,000	2.995	0	PASS	PASS
4	202006/11:22	2-CH4	5,000	5.019	35	PASS	FAIL

In REPORT screen, 5 kinds of reports are ready to be printed out: BREAKDOWN REPORTS, MAINTENANCE REPORTS, VALIDATION REPORTS, LIMS REPORTS, ALARM REPORTS There are two report types as PDF and Excel.

EXCEL COMPATIBLE FILE EXPORT

In REPORT SCREEN, EXPORT button creates an Excel compatible file for the query result displayed on screen.

EVENT LOG SEARCH FUNCTION

Event search function is available in EVENT LOG SCREEN.

USER PRIVILEGE CONTROL

In USER MANAGER SCREEN, user privilege is managed and created.