

## INNOVATION DAS & DAHS SOLUTIONS

### HARDWARE AND SOFTWARE FOR:

- CONTINUOUS EMISSION MONITORING
- PROCESS MONITORING
- AMBIENT AIR MONITORING

**H**  **RIZON**  
**S Y S T E M S**

## **WE OFFER:**



- **Software solution which replaces the subsystems for collecting, processing, transmitting and displaying data on the basis of classical PLCs.**
- **Software can be installed on any computer and any operating system, including one with free licenses.**
- **Completely take charge of managing your measurement system, organizing the collection, processing and displaying of data.**
- **Easy configure the mnemonic diagram, display, format and data processing according to your needs.**
- **Remote support and diagnose of your analysis system.**
- **Quick reinstalling of the system on any computer with an Ethernet interface which is impossible with the use of classic PLCs.**
- **Integration of your system with Computerized Process Control System, organization of High-Level subsystem on the basis of a common data server.**

## OUR CONCEPTION:

- Simple, clear, accessible, reliable, unified



- **Get any signals from your measuring systems**
- **Operate any solid-state and electrical relays, solenoid valves**
- **Know the number of working days remaining for cylinders with calibration gases**
- **Track the status of all components by diagnostic signals for preventive maintenance**
- **Display on your mnemonic scheme your measuring system, its components and their state**
- **Verify the validity data from your measurement system**
- **Perform analyzers automatic calibration: according to the schedule or by exceeding the deviations of the analyzers set in the system**
- **Perform collection, processing, displaying, archiving and data transmission**

# SYSTEM MANAGEMENT INTERFACE, DATA COLLECTION AND PROCESSING:

IN OPER. ALARM BLOW BACK SERVICE CALIBR.

BLOW BACK BYPASS

SAMPLE LINE CHILLER PUMP MOISTURE FLOW

CALIBR. CONDENS.

TEMP., DegC: 19.3

DUST, mg/m3: 0000

MOIST., %: 01.48

FLOW RATE, m3/s: 03.81

PRESSURE, kPa: 095.57

UNIT LOAD, %: 000

CO2 CO SO2 NO2 NO N2

RACKT. POWER UPS

GAS SENS. CIRCUIT DAHS

CO2: 0007 ppm

CO: 0000 ppm

NO: 0000 ppm

NO2: 0000 ppm

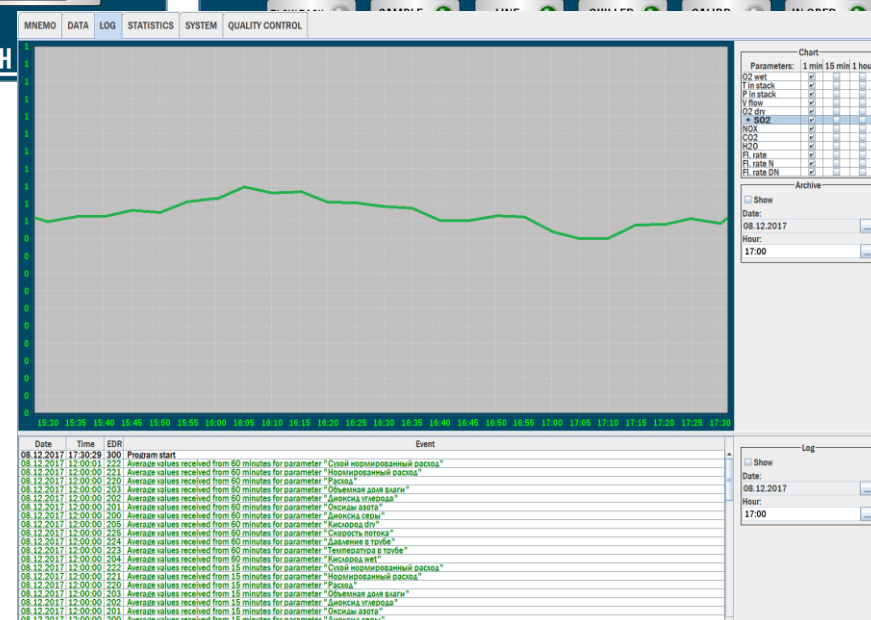
NOX: 0140 ppm

SO2: 0302 ppm

| DATA       | CO2 ppm | CO ppm | NO ppm | NO2 ppm | NOX ppm | SO2 ppm | TRS ppm | THC ppm |
|------------|---------|--------|--------|---------|---------|---------|---------|---------|
| CURRENT    | 7.2     | -      | -      | -       | 140     | 302     | -       | -       |
| 1 MINUTE   | 7.2     | -      | -      | -       | 140     | 302     | -       | -       |
| 6 MINUTES  | 7.2     | -      | -      | -       | 140     | 302     | -       | -       |
| 15 MINUTES | 7.2     | -      | -      | -       | 140     | 302     | -       | -       |
| 1 HOUR     | 7.2     | -      | -      | -       | 140     | 302     | -       | -       |

| DATA       | O2 DRY % | O2 WET % | MOIST. % | T. DegC | FL. m/s | PRES. kPa | DUST mg/m3 | FL. R m3/s |
|------------|----------|----------|----------|---------|---------|-----------|------------|------------|
| CURRENT    | 6.4      | 14.0     | -118.8   | 193     | 3.81    | 95.57     | -          | 2199.39    |
| 1 MINUTE   | 6.4      | 14.0     | -118.8   | 193     | 3.81    | 95.57     | -          | 2199.39    |
| 6 MINUTES  | 6.4      | 14.0     | -118.6   | 193     | 3.81    | 95.57     | -          | 2198.75    |
| 15 MINUTES | 6.4      | 14.0     | -118.8   | 193     | 3.81    | 95.57     | -          | 2199.39    |
| 1 HOUR     | 6.4      | 14.0     | -118.8   | 193     | 3.81    | 95.57     | -          | 2199.39    |



| EXCESS (HOURS) | STARTING UP | FAIL | SERVICE | EXCESS | IN OPER. | % EXCESS |
|----------------|-------------|------|---------|--------|----------|----------|
| CO2            | -           | -    | -       | -      | -        | -        |
| CO             | -           | -    | -       | -      | -        | -        |
| NO             | -           | -    | -       | -      | -        | -        |
| NO2            | -           | -    | -       | -      | -        | -        |
| NOX            | -           | -    | -       | -      | -        | -        |

| FAILURE (HOURS) | MONITOR | OTHER | Q. CONTROL | FAILURES | OVERALL | % FAIL. |
|-----------------|---------|-------|------------|----------|---------|---------|
| CO2             | -       | -     | -          | -        | -       | -       |
| CO              | -       | -     | -          | -        | -       | -       |
| NO              | -       | -     | -          | -        | -       | -       |
| NO2             | -       | -     | -          | -        | -       | -       |
| NOX             | -       | -     | -          | -        | -       | -       |

AVAILABILITY

IN OPER./FAIL./%: - - -

- We deliberately do not load the user with additional functions and work
- Work with software does not require special skills - it's our concept

- Our interface is user-friendly and protected from involuntary actions
- The maximum number of procedures is performed by the software independently

# DATA VALIDATION PROCEDURES INTERFACES:

MNEMO DATA LOG STATISTICS SYSTEM QUALITY CONTROL

CALIBRATION 168-H.TEST 7-D.TEST LINEARITY RATA

| CALIBRATION CYLINDERS |   |       |   |       |   |       |   |       |
|-----------------------|---|-------|---|-------|---|-------|---|-------|
|                       | # | CONC. | # | CONC. | # | CONC. | # | CONC. |
| CO2, mg/m3            | 1 | 0.0   | 2 | 1.0   | - | -     | - | -     |
| O2, mg/m3             | - | -     | - | -     | - | -     | - | -     |
| NO, ppm               | - | -     | - | -     | - | -     | - | -     |
| NO2, ppm              | - | -     | - | -     | - | -     | - | -     |
| SO2, ppm              | - | -     | 3 | 1     | - | -     | - | -     |

| CALIBRATION SEQUENCE |        |        |        |        |
|----------------------|--------|--------|--------|--------|
|                      | STEP 1 | STEP 2 | STEP 3 | STEP 4 |
| O2                   | -      | -      | -      | -      |
| CO2                  | 0      | SPAN 1 | -      | -      |
| NO                   | -      | -      | -      | -      |
| NO2                  | -      | -      | -      | -      |
| SO2                  | SPAN 1 | -      | -      | -      |

| CALIBRATION RUN |          |          |           |         |       |           |
|-----------------|----------|----------|-----------|---------|-------|-----------|
|                 | READINGS |          |           | ERROR   |       |           |
|                 | CURRENT  | EXPECTED | DEVIATION | CURRENT | PERM. | DEVIATION |
| "0"             | -        | -        | -         | -       | -     | -         |
| CO2, "SPAN 1"   | -        | -        | -         | -       | -     | -         |
| CO2, "SPAN 2"   | -        | -        | -         | -       | -     | -         |
| NO, "SPAN 1"    | -        | -        | -         | -       | -     | -         |
| NO, "SPAN 2"    | -        | -        | -         | -       | -     | -         |
| NO2, "SPAN 1"   | -        | -        | -         | -       | -     | -         |
| NO2, "SPAN 2"   | -        | -        | -         | -       | -     | -         |
| SO2, "SPAN 1"   | -        | -        | -         | -       | -     | -         |

| CALIBRATION SETTINGS |       |
|----------------------|-------|
| CALIBRATION          | ON    |
| CALIBRATION TIME     | 12:00 |
| DURATION "0"         | 3     |
| DURATION "SPAN 1"    | 3     |
| DURATION "SPAN 2"    | 5     |
| DURATION "SPAN 3"    | 5     |
| PURGE                | 0     |

17:32:14  
08.12.2017

MNEMO DATA LOG STATISTICS SYSTEM QUALITY CONTROL

CALIBRATION 168-H.TEST 7-D.TEST LINEARITY RATA

| LINEARITY/CGA TEST |          |        |        |        |        |       |      |   |            |
|--------------------|----------|--------|--------|--------|--------|-------|------|---|------------|
| RANGE              | CAL. GAS | PASS 1 | PASS 2 | PASS 3 | AVG    | PERM. | LIN. | V | DATE       |
| 20-30%             | 0.0238   | 0.0239 | 0.0230 | 0.0244 | 0.0238 | 5     | 0    | ✓ | 08.12.2017 |
| 50-60%             | 0.0641   | 0.0619 | 0.0665 | 0.0611 | 0.0632 | 5     | 1    | ✓ | 09.12.2017 |
| 80-100%            | 0.1039   | 0.1015 | 0.1084 | 0.1028 | 0.1042 | 5     | 0    | ✓ | 10.12.2017 |

| MONITOR |                                     |
|---------|-------------------------------------|
| O2      | <input checked="" type="checkbox"/> |
| CO2     | <input type="checkbox"/>            |
| NO      | <input type="checkbox"/>            |
| NO2     | <input type="checkbox"/>            |
| SO2     | <input type="checkbox"/>            |

START

STOP

REPORT

- QA and QC procedures are built in our program
- It is impossible to overstress the importance of WEB interface and mobile apps

MNEMO DATA LOG STATISTICS SYSTEM QUALITY CONTROL

CALIBRATION 168-H.TEST 7-D.TEST LINEARITY RATA

| RATA TEST |            |       |       |       |        |      |       |       |       |
|-----------|------------|-------|-------|-------|--------|------|-------|-------|-------|
| #         | DATE       | TIME  | CO    |       | O2 DRY |      | CO    |       | DIFF  |
|           |            |       | Rm    | CEMS  | Rm     | CEMS | Rm*   | CEMS* |       |
| 1         | 08.12.2017 | 17:34 | 505.2 | 483.9 | 2.9    | 2.9  | 425.3 | 406.3 | 19.0  |
| 2         | 08.12.2017 | 18:34 | 485.9 | 513.2 | 2.9    | 3.0  | 408.9 | 434.0 | -25.1 |
| 3         | 08.12.2017 | 19:34 | 515.3 | 490.9 | 3.1    | 3.0  | 438.8 | 414.1 | 24.7  |
| 4         | 08.12.2017 | 20:34 | 507.4 | 491.9 | 2.9    | 3.0  | 427.0 | 415.1 | 11.9  |
| 5         | 08.12.2017 | 21:34 | 521.6 | 515.9 | 3.0    | 2.9  | 440.6 | 433.2 | 7.3   |
| 6         | 08.12.2017 | 22:34 | 497.8 | 517.2 | 3.1    | 3.1  | 423.5 | 439.6 | -16.2 |
| 7         | 08.12.2017 | 23:34 | 495.9 | 514.1 | 3.1    | 3.0  | 420.4 | 435.2 | -14.8 |
| 8         | 08.12.2017 | 00:34 | 498.7 | 489.8 | 3.1    | 2.9  | 422.6 | 411.7 | 10.9  |
| 9         | 08.12.2017 | 01:34 | 489.7 | 492.6 | 3.0    | 3.1  | 412.6 | 419.2 | -6.6  |
| 10        | 08.12.2017 | 02:34 | 501.8 | 506.0 | 2.9    | 3.0  | 422.3 | 427.3 | -4.9  |
| AVG       |            |       |       |       |        |      | 424.2 | 423.6 | 0.6   |

| RESULT  |          |        |   |
|---------|----------|--------|---|
| RESULT  | EXPECTED | ACTUAL | V |
| RATA, % | 7.5      | 2.93   | ✓ |
| BIAS, % | 4        | 0.00   | ✓ |

| CHANNEL |                                     |
|---------|-------------------------------------|
| CO      | <input checked="" type="checkbox"/> |
| CO2     | <input type="checkbox"/>            |
| NO      | <input type="checkbox"/>            |
| NO2     | <input type="checkbox"/>            |
| SO2     | <input type="checkbox"/>            |

START

STOP

REPORT

HORIZON

MNEMO DATA LOG STATISTICS SYSTEM QUALITY CONTROL

CALIBRATION 168-H.TEST 7-D.TEST LINEARITY RATA

| 7-CONSECUTIVE DAYS CALIBRATION TEST |            |        |          |        |           |        |
|-------------------------------------|------------|--------|----------|--------|-----------|--------|
| DAY                                 | DATE       | RANGE  | EXPECTED | ACTUAL | DEVIATION | RESULT |
| 1                                   | 08.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 2                                   | 09.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 3                                   | 10.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 4                                   | 11.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 5                                   | 12.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 6                                   | 13.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |
| 7                                   | 14.12.2017 | "0"    | -        | -      | -         | -      |
|                                     |            | "SPAN" | -        | -      | -         | -      |

| MONITOR |                                     |
|---------|-------------------------------------|
| O2      | <input checked="" type="checkbox"/> |
| CO2     | <input type="checkbox"/>            |
| NO      | <input type="checkbox"/>            |
| NO2     | <input type="checkbox"/>            |
| SO2     | <input type="checkbox"/>            |

START

STOP

REPORT

HORIZON

- We frame our solution using the last 30 years of world experience
- This allows us to always be ahead of the requirements in the Russian Federation

- **Conditioning 168 hours Test Period**
- **Operational 168 hours Test Period**
- **Daily calibration drift/error check and adjustment**
- **Linearity**
- **System Cycle Time/Response Time Test**
- **Seven consecutive days calibration drift/error test**
- **Relative accuracy test audit (RATA)**
- **Cylinder Gas Audit (CGA)**

QA/QC



- Before implementation, we perform debugging on the real testing bench where we recreate your measuring system
- We invite you and jointly conduct all necessary tests and inspections
- If you have any questions, we will quickly recreate your measuring system on the prototype and will conduct the inspections you are interested in
- When upgrading your measuring systems, we firstly work out all the necessary improvements on the prototype and only after that implement it to the system

## DAS & DAHS PROJECTS COMPLETED:

| Year | CEM&AAM | MEL | WQMS |
|------|---------|-----|------|
| 2018 | 25      | 1   | 3    |
| 2015 |         | 1   |      |
| 2015 |         | 1   |      |
| 2016 | 2       | 1   |      |
| 2016 | 1       |     |      |
| 2018 |         | 1   |      |
| 2017 |         | 1   |      |
| 2016 |         | 1   |      |
| 2016 | 3       |     |      |
| 2014 | 24      | 1   |      |
| 2014 | 33      | 3   |      |
| 2012 | 4       |     |      |
| 2012 | 5       | 3   |      |
| 2010 | 14      | 3   |      |

### AGENDA:

- CEM&AAM – DAS & DAHS for continuous emission and ambient air monitoring
- MEL - DAS & DAHS for mobile environmental laboratory
- WQS – DAS & DAHS for water quality system

**IN CASE OF ANY QUESTIONS DO NOT HESITATE TO CONTACT US**

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