



# Accuracy from start to finish

DR3900 Spectrophotometer with RFID technology for water analysis



Be Right™



**1** Sampling

**2** Sample Preparation

**3** Analysis



## Complete sample data

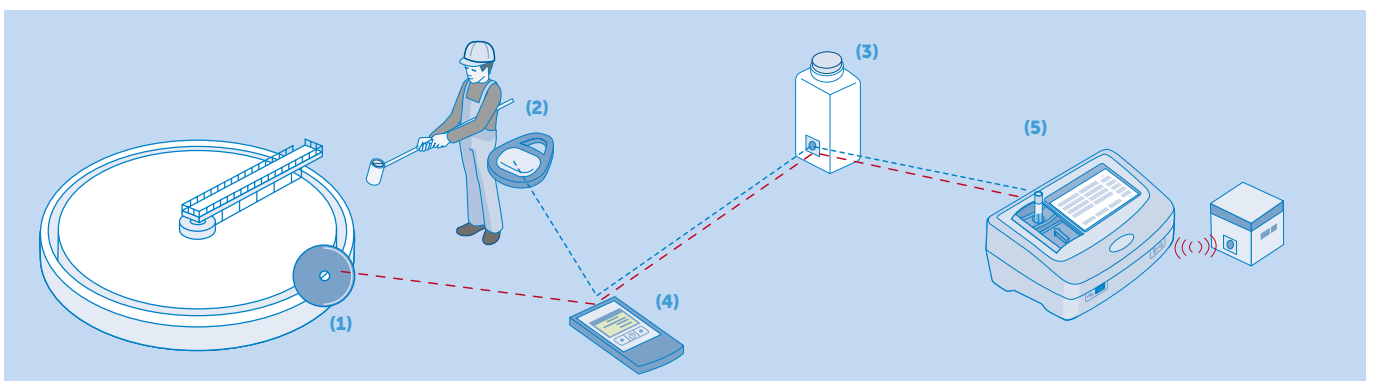
Samples must be traceable in order to produce reliable, recognised results in the field of water analysis. This traceability can be guaranteed by consistently logging and documenting each link in the analysis chain, which is where RFID (Radio Frequency Identification) comes into play. RFID is a key technology used to facilitate the identification of system modules. Each sample is assigned its unique RFID identifier and the relevant data at the time it is taken. The entire process is fully documented, which means it is permanently traceable.

# Traceability from start to finish

4 Quality Assurance

5 Documentation

## Accurate transfer of sample data using RFID



The LOC100 RFID locator (4) transfers the data associated with the sample location (1) and user RFID tags (2) to the sample RFID tag (3). RFID technology uses tags as data carriers. The DR3900 Spectrophotometer (5) automatically reads the sample data from the sample RFID tag (3); sample location, sampler taker, date, time etc.

# Clear allocation



1 Sampling

2 Sample Preparation

3 Analysis



## Which sample? Which user?

The DR3900 Spectrophotometer uses RFID technology to enable reliable communication with the sample taker and the samples. When the user holds the user RFID tag in front of the photometer RFID module, he or she is automatically identified and recorded as the user. The process of reading the data from the RFID tag on the sample bottle to the DR3900 is equally reliable.

When evaluating the cuvette test, simply use the touchscreen to assign the result to the sample. No matter what the purpose of the analysis, reliability is always the top priority and is guaranteed by means of unique user and sample identification.



**4** Quality Assurance

**5** Documentation

## Perfect sample preparation for accurate results



### **TOC X-5 Shaker:**

For stripping the TIC from up to eight samples while determining the TOC



### **HT200S high-temperature thermostat:**

For rapid sample decomposition with COD,  $P_{tot}$ ,  $TN_b$  and complete heavy metals



### **Thermostat LT200:**

For standard decomposition of COD,  $P_{tot}$ ,  $TN_b$ , TOC and complete heavy metals



1 Sampling

2 Sample Preparation

3 Analysis



## RFID: latest technology to avoid errors

The procedure for cuvette tests is subject to ongoing development and as such is necessary to update the photometer data on a regular basis. The photometer reads the cuvette barcode and automatically identifies that there is a new cuvette test available or that an existing method must be updated. The required calibration data is now incorporated into the RFID tag on the packaging.

The DR3900 directs the user to hold the cuvette box in front of the RFID module and the system then updates itself automatically. All subsequent measurements then use the current data.

# Reliable updates



**4** Quality Assurance

**5** Documentation

## Quick and reliable updates



### Step 1

The DR3900 reads the barcode on the cuvette and identifies that a data update is required for that specific test.



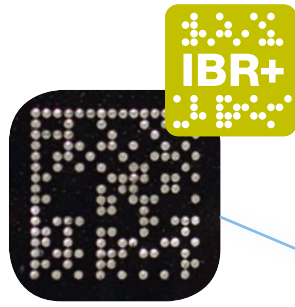
### Step 2

It then indicates that the cuvette box should be placed in front of the photometer. After two seconds, an audio signal confirms that the data has been updated.



### Step 3

Measurement is initiated automatically once the update is complete, using the correct factors to make sure that the measurement result is also correct.



1 Sampling

2 Sample Preparation

3 Analysis



## 2D barcode: documented shelf life

The new 2D barcode also details the batch number and the expiry date of the reagents. During the rotating ten times measurement process using the IBR+ barcode reader, the DR3900 immediately picks up all the information on the cuvette. The batch number and expiry date are documented along with the measurement result. If the expiry date has already passed, an automatic warning will be issued. This prevents reagents inadvertently being used when they have expired.



# Increased reliability



4 Quality Assurance

5 Documentation

Diverse range of reagents: More than 50 parameters and over 100 measurement ranges

Ammonium	Reduction agents
Nitrate	Cadmium
Phosphate	Lead
Nitrite	Copper
TN <sub>o</sub>	Zinc
CSB	Surfactants
TOC	Bitter units
AOX	Oxygen
Chlorine	Chloride
Ozone	Sulfide
Chlorine dioxide	Organic acids
Iron	Silicic acid
Manganese	Molybdate
Hardness	
Hydrazine	
DEHA	
	and many more...

# From AQA to AQA+



**1** Sampling

**2** Sample Preparation

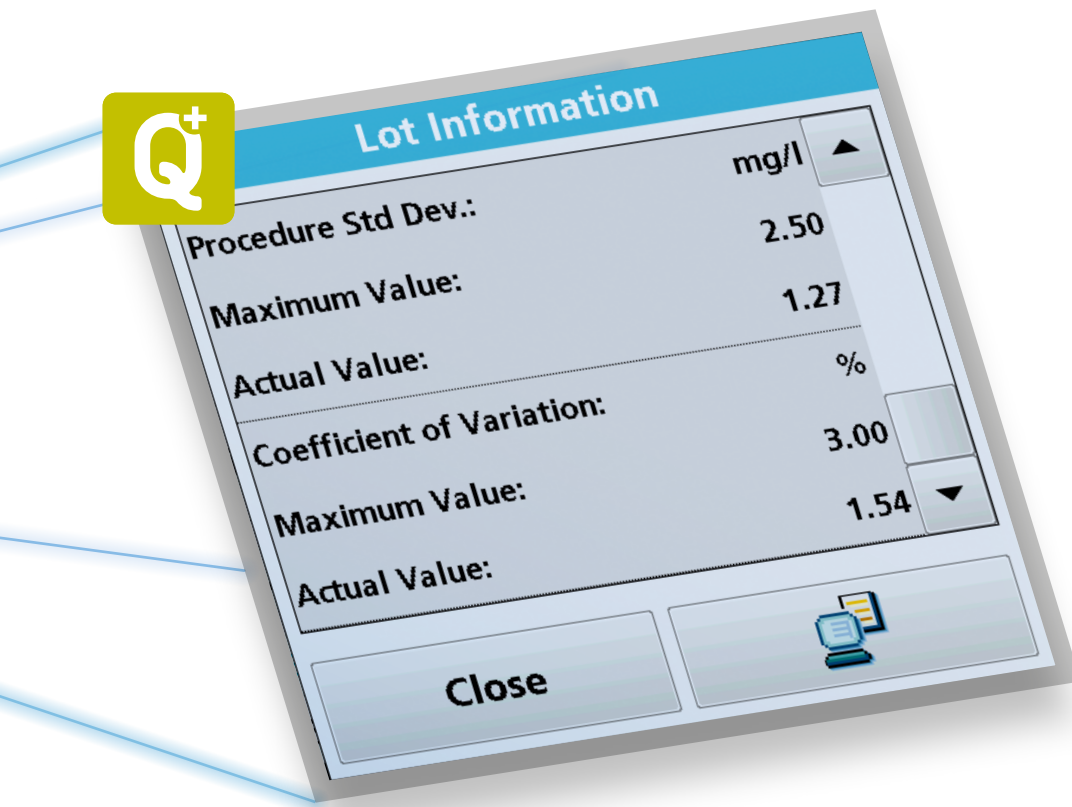
**3** Analysis

## Ad hoc batch certificates

AQA measures can now be defined and documented in the photometer itself, without the need for additional software. A configurable reminder function provides support with everyday work and current batch certificates (for GMP/GLP documentation purposes) can be found on the RFID tag in the cuvette box. This RFID technology means that all batch specific information can be retrieved immediately on the photometer and printed out.

Measurement values are saved using the established Addista system with standard and round robin solutions. Quality control cards can now be created and maintained in the Spectrophotometer.

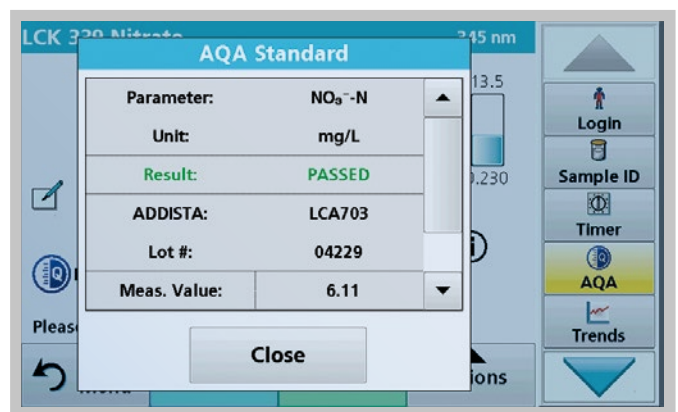
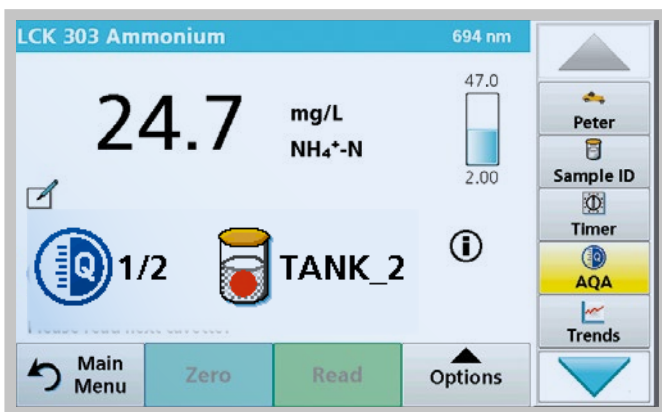




4 Quality Assurance

5 Documentation

## Built in reliability



All the necessary information is provided using simple images or text. The data is always accurate and clear, regardless of whether it concerns repeat determinations or plausible measurement values.

# Process analysis



1 Sampling

2 Sample Preparation

3 Analysis



## Laboratory and process: Real-time communication

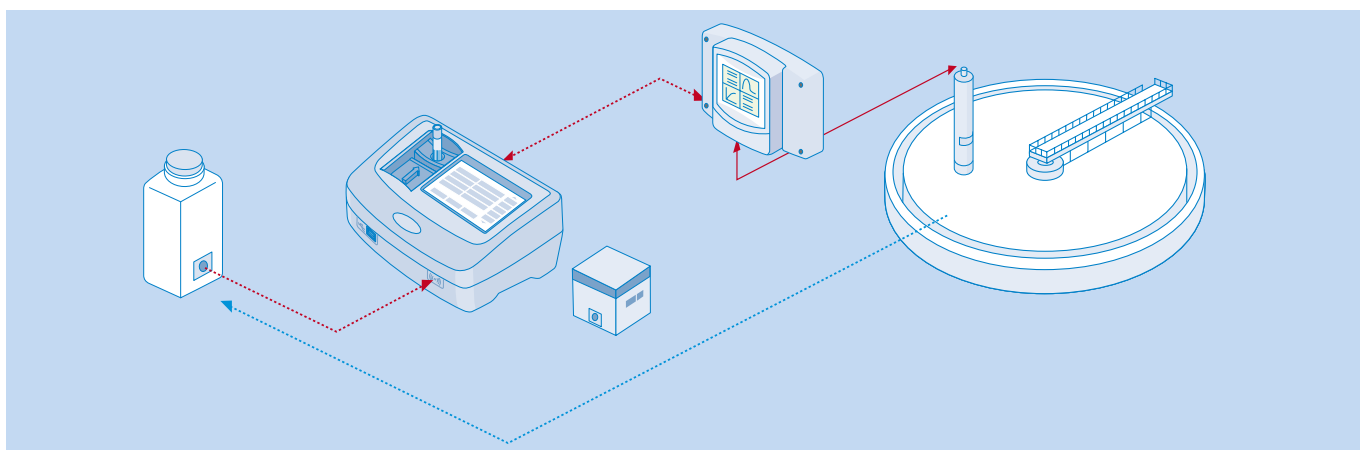
The Link2sc connection between the photometer and the SC controller guarantees that analysis is transparent, facilitating direct comparison between laboratory and process results. Bi-directional data streams simplify processes (such as a matrix correction in an AN-ISE sc probe) and also deliver impressive reliability.



**4** Quality Assurance

**5** Documentation

## Adjust and calibrate using Link2sc.



### Four stage result adjustment:

1. Take the sample; enter a job using the controller
2. The job (process measurement value, time etc) is sent to the DR9000 in the laboratory via Ethernet.
3. The reference sample is analysed at the laboratory using a cuvette test and the photometer; it is then compared with the process result.
4. The data from the laboratory is returned to the controller via Ethernet and the process probe is adjusted (where necessary).

# Clear text data



**1** Sampling

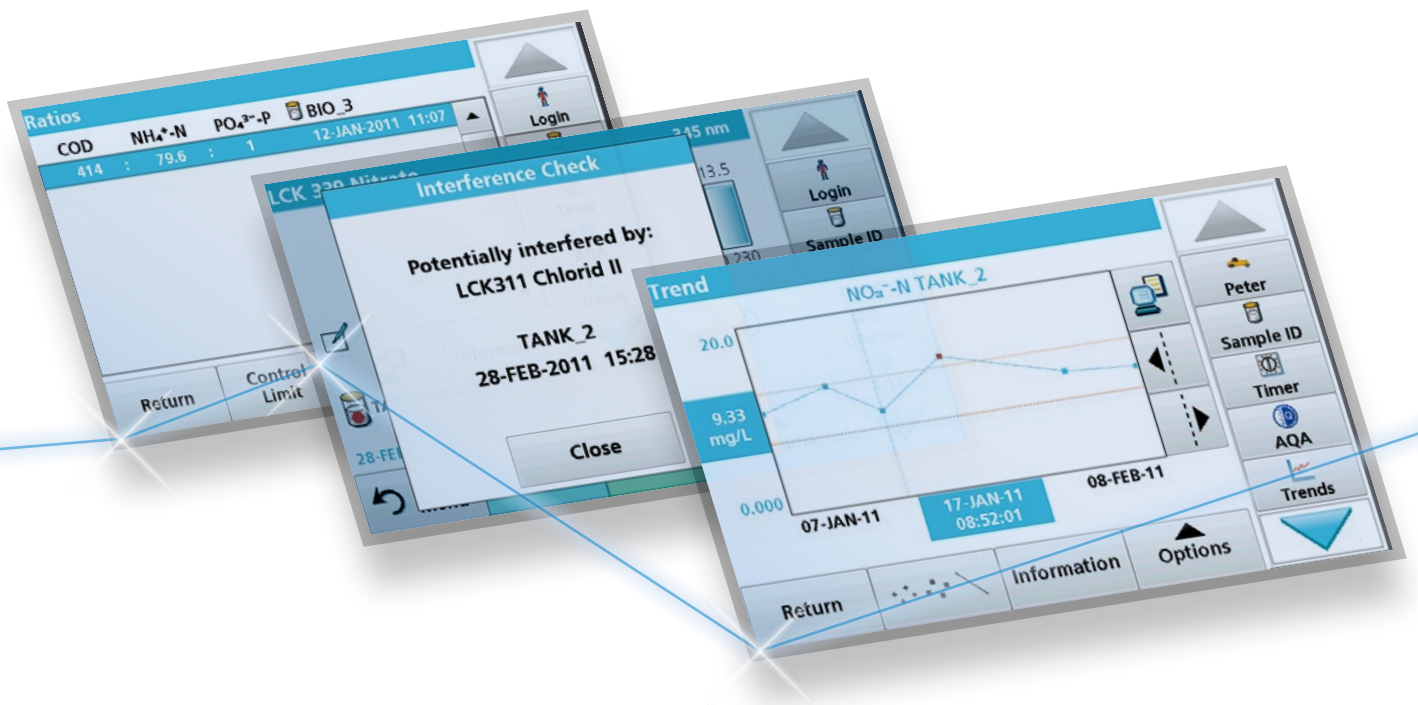
**2** Sample Preparation

**3** Analysis



## Clear interpretation of results

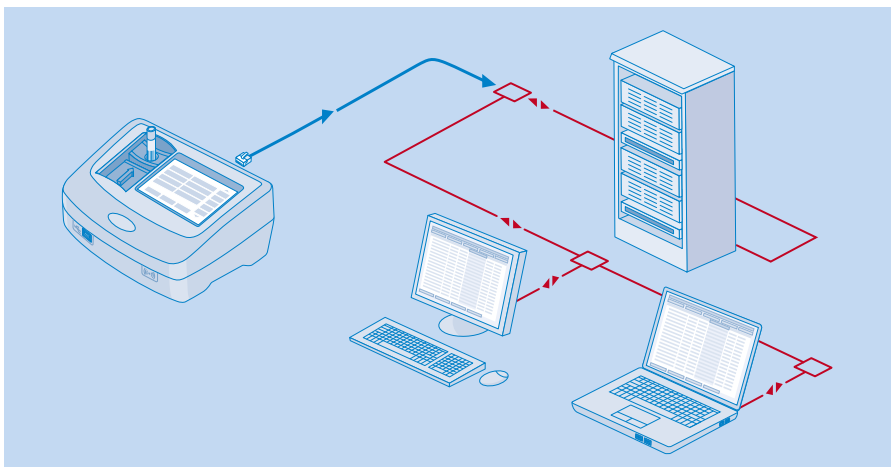
The DR3900 Spectrophotometer can be networked, to support the documentation of analysis data with various connected systems. The DR3900 also helps to make sure that measurement values are correctly interpreted and classified. One of the ways it does this is to send an automatic warning if the values deviate from the typical C:N:P ratio. The system also draws attention to any interference factors that may distort results. In addition, there are visual and audio warnings if any limit values are exceeded and it is always possible to set customised target and limit values that take into account local conditions. The DR3900 delivers comprehensive reliable water analysis results.



## 4 Quality Assurance

## 5 Documentation

### Transfer data to existing networks



The measurement data from the DR3900 Spectrophotometer is transferred either via Ethernet connection or via USB stick. No special software is required.

## The Complete Solution for Water Analysis

# DR3900 Spectrophotometer Consistent reliability

The DR3900 Spectrophotometer with RFID, IBR+, AQA+ and Link2sc delivers maximum reliability at every stage of the water analysis process:

1



### Sampling

- Reliable sample identification and traceability using RFID identifiers



2



### Sample Preparation

- Clear sample allocation in the laboratory by means of RFID data transfer



3

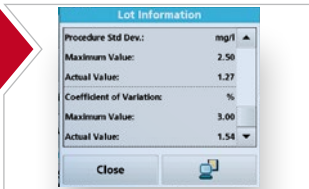


### Analysis

- Documented batch information, including expiry date, by means of 2D barcode
- Data update using cuvette packaging and RFID



4



### Quality Assurance

- Batch certificates available instantly by means of cuvette test box and RFID
- Accurate adjustment of lab/process measurement values



5



### Documentation

- Simple, reliable transfer of data to networks via Ethernet connection