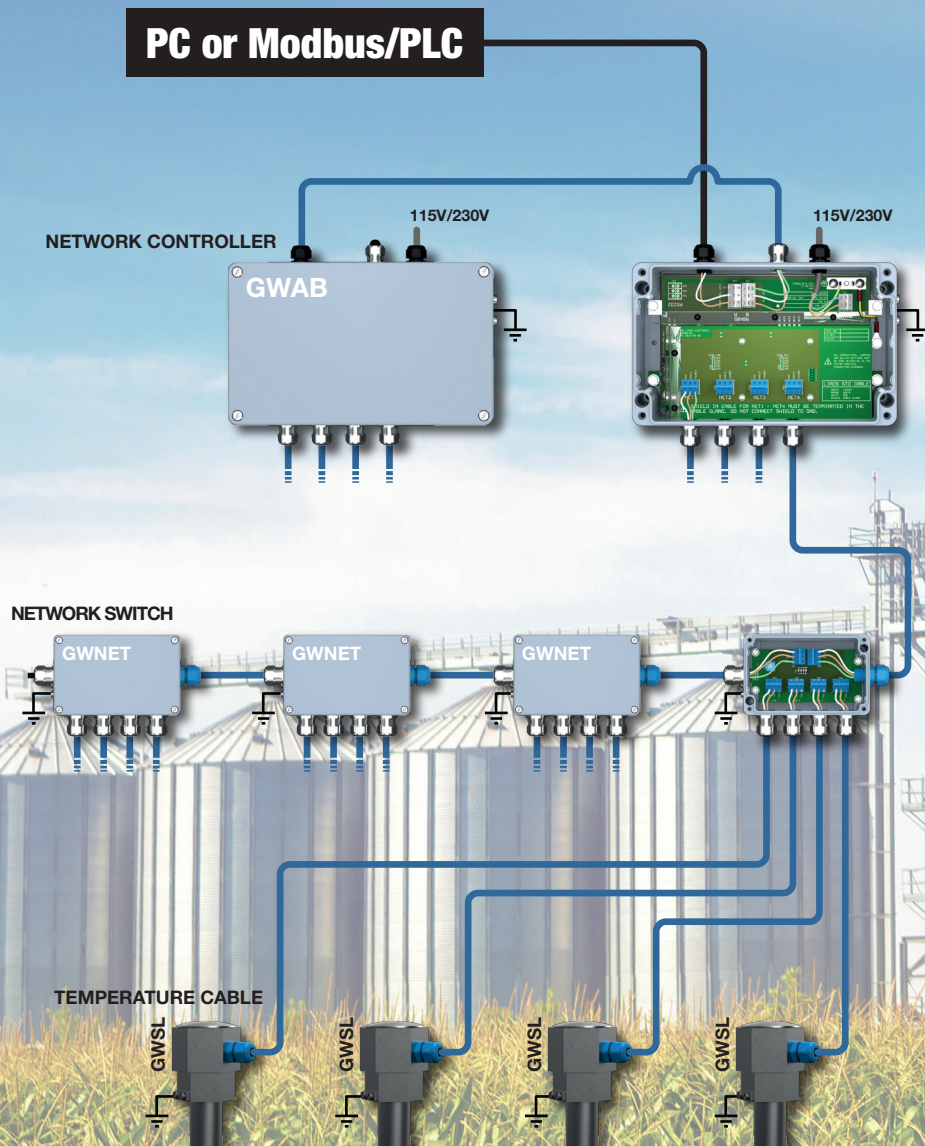


## Temperature Monitoring Systems for Solid Bulk Storages



AB LINDS ELECTRONIC  
REGISTERED TO ISO 9001:2008  
CERTIFICATE NO. 422315 QM08

## Temperature Cables for Steel and Concrete Silos

Temperature monitoring is a vital link in the post-harvest chain and is already a formal requirement in many countries around the world. It is the only effective way to ensure that grain is stored under optimal conditions, thus adding to its value all the way. Heat caused by respiration, moisture, insect infestation or mold can be detected in time, significantly reducing the risk of loss of value or even spoilage.

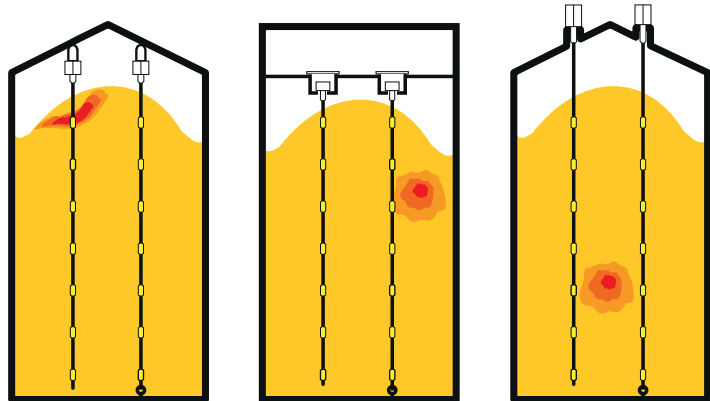
The Grain-Watch® system is also used for temperature monitoring in other solid bulk storages, such as biomass, wood pellets and animal feeds.

### System Advantages

- Fully digital system with 1-wire digital sensor technology
- Modular – easily expandable
- Calibration-free. For life.
- 2- and 3-core cable connections between components
- Stable RS-485 bus to PC/PLC
- ATEX- and IECEx-certified
- Readout via hand unit, PC software or Modbus RTU
- Versatile. Many fields of use

### Process Connections

- onto hooks or brackets underneath the silo roof
- in floor wells or roof consoles
- in customer-installed pipe sockets on top of the silo roof



Grain-Watch® temperature cables are made from durable steel conduit cable and fitted with top-quality digital sensors using innovative 1-wire technology. This allows for thin yet strong temperature cables (diameter: 9.8 mm), significantly reducing the roof load during filling and emptying.

The sensors are calibrated for life, no sensor calibration or maintenance is needed — ever. Standard sensor spacing is 2m or 3m.



**GWSL1100**  
Cable:  $\varnothing$  9.8 mm  
Lengths: 1 - 35 m  
Number of sensors:  $\leq$  32  
Sensor spacing: 2 m or 3 m  
Tensile strength:  $\leq$  2.5 t  
Roof load, filling/emptying: 25 kg/m

**GWSL2100**  
Cable:  $\varnothing$  17.0 mm  
Lengths: 1 - 100 m  
Number of sensors:  $\leq$  32  
Sensor spacing: 2 m or 3 m  
Tensile strength:  $\leq$  8.0 t  
Roof load, filling/emptying: 50 kg/m

## Temperature Spears for Flat Storages

The Grain-Watch® temperature spears are fitted with the same high quality digital sensors and 1-wire technology. They are designed to monitor temperature in piles or on-floor storages. The spears can be connected in series of up to 32 sensors.

Temperature readout and managing is done via hand-reader or PC system using the Grain-Watch® TMS Software or Modbus RTU protocol. Since spears and temperature cables share the same 1-wire digital sensor technology, they are fully compatible and can be integrated into one system.

The Grain-Watch® temperature monitoring spears are available in steel, fiberglass and composites.

### Composite – rollable

GWTL-R is a new generation of temperature spears. It is flexible, yet strong. It can penetrate commodities at depths up to 12 meters. After use, it can easily be rolled up and stowed away until the next season.



Length	2 m	4 m	6 m	8 m	10 m	12 m
Number of sensors	1	2	3	4	5	6

### Fiberglass



Length	250 cm	400 cm	550 cm
Number of sensors	2	3	4

### Steel



300 cm, 2 sensors

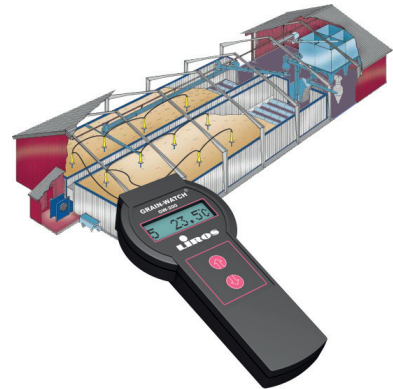
## Hand Instrument

### GW-200 Hand-Reader

Easy-to-use hand-held temperature monitoring unit with two intuitive buttons and backlit display. Enables easy handling and reading, even in dimmer locations.

At the push of a button you get the temperature readings from all sensors, from the bottom to the top. After reading the temperature values, the GW-200 automatically displays the sensor with the highest temperature value. The buttons enable scrolling between sensors.

Upgrading the Grain-Watch system from a hand-held to a PC system is easy — the modular configuration and the use of the same high quality digital sensors in both temperature cables and spears make expansion easy.



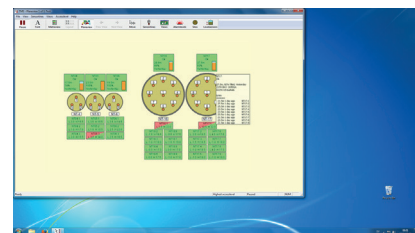
## Presentation

### TMS PC Software

- Continuous monitoring 24/7
- Adjustable, color-coded alarms
- TMS History: detailed temperature graphs for each cable or spear

### Modbus/PLC

- RS-485 bus
- Temperature transmission via Modbus protocol
- Integrates into existing control systems (SCADA)

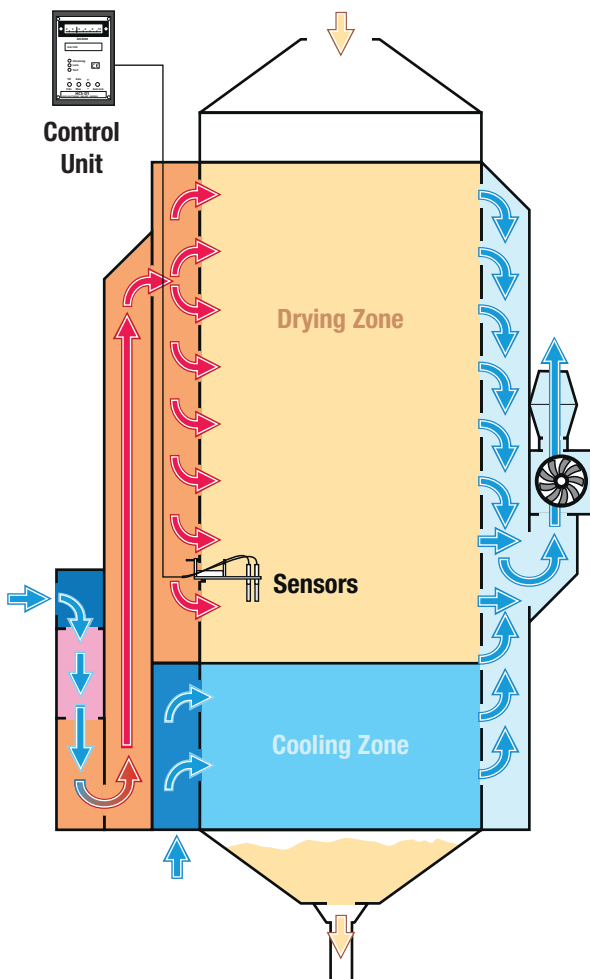


## Electronic controller for continuous flow dryers

The HCS Grain Dryer Control System can be installed in nearly every continuous flow grain dryer, from small farm to large industrial dryers. The system consists of sensors (HCS 4/2), signal amplifiers (HCS 200), and a Control Unit (HCS D1/2/3).

The sensors are easily installed without the use of tools at the bottom of the drying zone and continuously measure the moisture content in the commodity being dried. These values are passed on through the Signal Amplifiers to the Control Unit, which is used to regulate the feed-out intervals and speed. Each Signal Amplifier has a 4-20mA output which can be integrated into existing PLCs. The placement of the sensors is important to achieve optimal drying results, and multiple sensors may be needed depending on the size of the dryer.

The Control Unit is used to regulate the drying cycles. Once the optimal feed-out intervals and speed are found, the Control Unit can be set into auto-mode and dries the remaining batch at the same setting. Control Units are available for volumetric extraction, shaker extraction and conveyor extraction.



## Control Unit



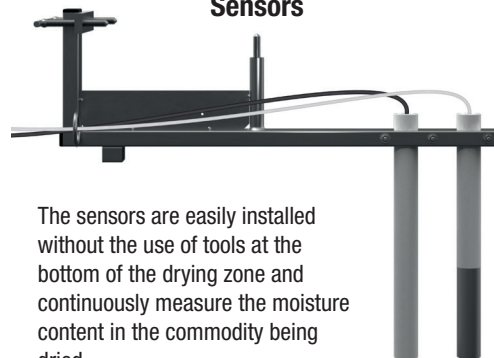
The Control Unit is the hub of the system and designed with more than 35 years of knowledge and experience of control systems for grain dryers. Easy handling, clear display and rugged switches.

## Amplifier



Rugged, dustproof enclosure, mounted onto the outside of the dryer. Also acts as a signal converter between the sensors and the control unit.

## Sensors



The sensors are easily installed without the use of tools at the bottom of the drying zone and continuously measure the moisture content in the commodity being dried.

