

## EST Grain Silo Temperature & Level Monitoring System



### SYSTEM INTRODUCTION

Temperature is a key factor for maintaining grain quality in a grain storage system. When the grain has suffered from deterioration, corrosion or pest and disease damage, the temperature is increased inevitably. If precise temperature information of the grain can be mastered, an air conditioning system can be more efficiently controlled to achieve high efficient energy management.

For silo management, an EST system can measure grain temperature in silo and measure stored grain level synchronously, thereby not only instantly tracking and recording grain conditions, recording historical records, but also providing optimal grain storage quality monitoring.

The EST can be matched with the FineLink hub series, and employs an RS485 communication interface to transmit information to a central control room or a human-machine interface via wire or wirelessly.

The EST is matched with MMSTLA silo information and integrated with monitoring software, so that a user can easily monitor dual information, both the temperature and grain level in the silo, through a remote computer, thereby performing grain storage management with the utmost convenience and efficiency.



## EST10000-A

### A Multi-Point Temperature Sensor

#### FEATURES

- Reinforced steel cable design can effectively resist the impact of grain and prolong service life of the product.
- Provide multi-point temperature measurement to help managers cope with food more swiftly.
- Detect whether there is fungus produced or activities of insects, to maintain food quality.
- Provide real-time monitoring of silo temperature for practitioners in food, fodder and grain, to help long-term storage.
- Prevent qualitative change of grain in the silo and fire disaster due to smolder.
- Temperature measurement position can be customized according to customer's requirements, which can be hung outside or built in the silo.

#### SPECIFICATIONS

<b>Measurement range</b>	-10 ~ 85°C
<b>Resolution</b>	0.1°C
<b>Accuracy</b>	+/- 0.5°C
<b>Length Max.</b>	Max. 30m
<b>Quantity of sensors</b>	Max. 30pcs
<b>Position of sensors</b>	One sensor is built in every meter
<b>Cable material</b>	Coated with XLPE, inner ring is copper wire (Standard)
<b>Tensile load</b>	2500 Kgf
<b>IP rating</b>	IP67
<b>Housing material</b>	SS41 Low-carbon steel
<b>Outgoing cable diameter</b>	ø 4~7mm
<b>Ambient temp. (Ta)</b>	T80°C: -40<Ta<70°C T95°C: -40<Ta<80°C

## EST10000-B

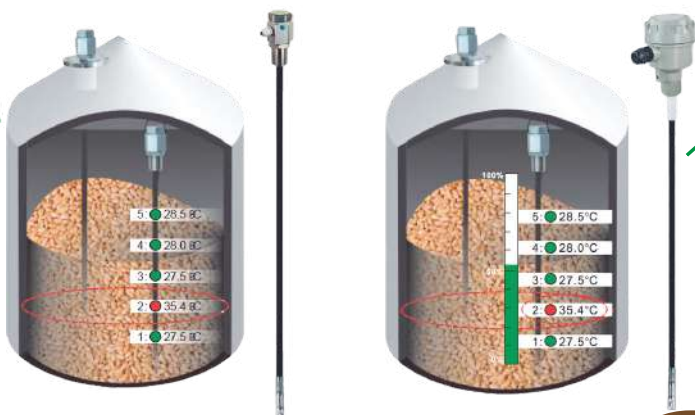
### 2 in 1 Grain Temperature & Level

#### Monitoring Transmitter

- Unique in the industry, EST10000-B transmitter integrated with simultaneous monitoring of grain level and temperature
- Steel cable design can effectively resist the impact of grain and prolong service life of the product.
- Real-time multi-point temperature measurement to help managers cope with food more swiftly
- Detect whether there is fungus produced or there are activities of insects, to maintain food quality and facilitate long-term storage.
- Prevent qualitative change of grain in the silo and fire disaster due to smolder.
- Temperature measurement can be customized according to customer's requirements.
- Any two points of EST10000-B are in simple calibration mode of grain level.
- The product uses open main current communication interface RS485.
- The system user can install the device on any system having the communication interface.

#### SPECIFICATIONS

<b>Power input</b>	9~30 Vdc
<b>Measurement range</b>	-10~85°C
<b>Resolution</b>	0.1°C
<b>Accuracy</b>	+/- 0.5°C
<b>Length</b>	Max. 30m
<b>Quantity of sensors</b>	Max. 30pcs
<b>Position of sensor</b>	One sensor is built in every meter
<b>Sampling speed</b>	Grain level measurement: <1 sec Temperature measurement: <1 sec/node
<b>Non-linearity of grain level</b>	+/- 1% FS.
<b>Output interface</b>	RS485; Baud Rate: 9600~57600 bps
<b>Material of junction box</b>	Aluminium alloy (ADC-12)
<b>Outgoing cable diameter</b>	ø 4~7mm
<b>Cable material</b>	Coated with XLPE, inner ring is copper wire
<b>Tensile load</b>	2500 Kgf
<b>IP rating</b>	IP 67
<b>Ambient temp. (Ta)</b>	T80°C: -40<Ta<70°C T95°C: -40<Ta<80°C



## FINELINK SYSTEM HUB, 1-WIRE and RS485

### FineLink 1-wire / FineLink 1-wire wireless



It extends and connects to the sensor through wired way, which can connect 4 sets of EST10000-A 1-Wire communication modes. Each sensor has an independent connection, which can prevent the whole system from crashing due to a particular equipment failure, so as to make users capable of maintaining multiple equipment more easily. 1-wire digital signal can be transformed to RS485 to make MMS-TL silo temperature and grain level management system or PLC read and use.

### FineLink RS485 / FineLink RS485 wireless



It integrates 4 sets of signals with RS485 communication mode to make wiring more convenient and clear. Each port is independent, which can prevent the whole system from crashing due to a particular equipment failure, to make users capable of maintaining multiple equipments more easily. 4 sets of 4-wire type connection ports also supply 24VDC power for external device

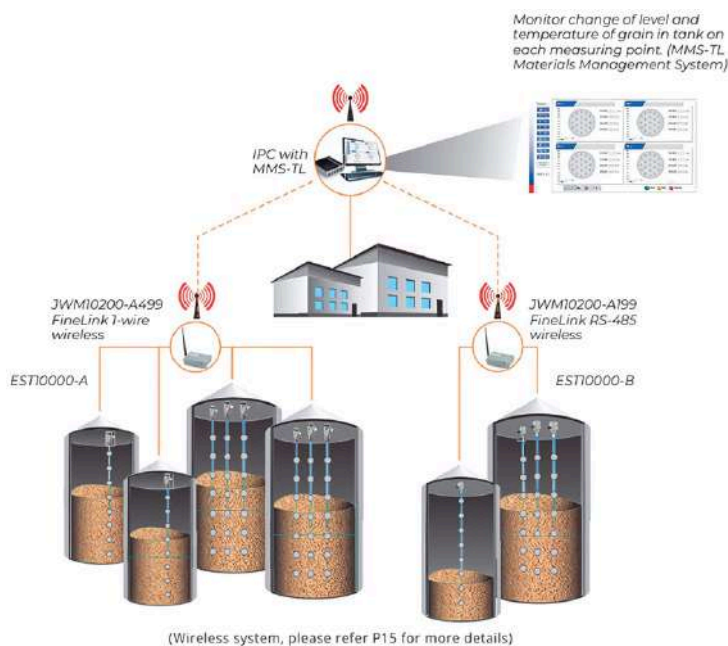
### System Hub



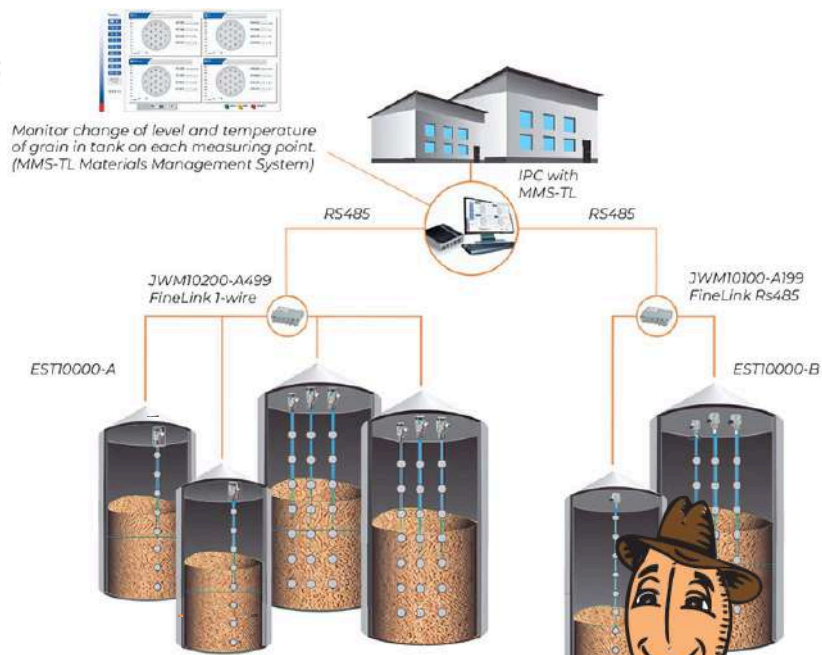
The multiple measuring data in one sensor will be interpreted by FineLink through RS-485 signal and send out to PC or other human machine interface. So the immediate temperature status can be monitored. In order to prevent infestation of pest in the storage when there is temperature changes.

## SYSTEM ARCHITECTURE

### Wireless System



### Wired System



## ELECTROMECHANICAL LEVEL MEASURING SYSTEM



SYSTEM DIAGRAM



### FEATURES

- Measurement immune from the interference of environment such as sound waves, dust, capacitance, or temperature change.
- User-friendly in touch buttons with microprocessor-based calculation design.
- Cable Break Alarm: System will detect cable broken during measuring.
- Plumb Buried Protection: System can sense and stop the measurement as the plumb hit by materials and retrieve the wire to prevent the plumb being buried.
- Auto Return Setup: Prevent sensing weight from buried or sliding into the tank pivot and avoid damage facility equipment while tank is empty.
- Freeze Prevention Capability: being able to work normally in cold temperature.

## APPLICATION

### FEATURES

- Suitable for different variety of materials as powder, pellet, liquid, and also good for open tanks or sealed tank with no inner pressure inside.
- Working perfectly with software of material management system (MMS), accurately monitoring and managing the level of materials inside the tank.



MMS

RS485 (ModBus)

RCU

