# INSTALLATION AND OPERATING INSTRUCTIONS FOR WIRELESS KILN DATA ACQUISITION SYSTEM

consisting of Kiln Data Collectors and Kiln Data Transmitters

## INTRODUCTION

These instructions are intended for professional manufacturers of lumber drying equipment who use the Wireless Dataacquisition System as part of their kiln control systems.

## SYSTEM

The Wireless Dataacquisition System features individual, battery-powered Kiln Data transmitters for each MC or EMC station, transmitting the readings they determine via radio frequencies to at least one Kiln Data Collector.
The Kiln Data Collector picks up the data from Kiln Data Transmitters and also determines dry bulb temperature readings (and wet bulb temperature readings, optional).

The system can be installed in dry kilns, it has been designed to withstand the corrosive, hot air conditions existing there. The components used are specified for ambient temperatures of up to 85C/185F and the circuitry is encapsulated in a highly insulating epoxy compound with maximum hydrolytic stability protecting it against high ambient air humidity.

## KILN DATA TRANSMITTER

### PLACING TRANSMITTERS IN THE LUMBER:

1. The Kiln Data Transmitters can either be permanently connected to an EMC-Station or to electrodes that are placed in wood to measure the Moisture Content.
The electrodes must be placed in the wood in predrilled holes of 3mm (5/32") at a distance of 30mm (1 1/4").

2. Position transmitters so that the antennas are pointing outwards from the pack. If the sticker space is too small, letting the transmitters hang from the wires is fine as long as there is no constant swinging due to ventilation.

3. Don't "bury" them in the packs. They need some "air" between them and the data collectors. If they are completely surrounded by wet lumber, then the radio frequency signal will be weakened too much. Placing the packs in the kiln with a small gap between each other not only improves airflow but also opens up an unobstructed path for the radio signal.

4. If MC-based drying schedules are used right from the beginning of a kiln charge, then it can be necessary to place at least 2 transmitters on the OUTSIDE of the lumber packs.
Readings from these 2 transmitters can be used for the average MC at the beginning of the kiln charge when the lumber is wet and when transmitter signals originating from within the packs might be unreliable.
When more or all wood probes recover, the average MC can be based on the readings coming from all valid transmitters placed within the packs.

HANDLING OF TRANSMITTERS:

The Kiln Data Transmitter has been designed for everyday use in a harsh kiln environment. However, damage (mechanical and to the circuitry) can occur if these guidelines are not followed to avoid conditions of abuse:

1. The probe wires are there to connect the transmitter to the probes.
They are not intended to be used as a pulling device when the transmitter gets stuck in or to the lumber.
Don't disconnect the wires from the probes by yanking on the transmitter.

2. The admissible temperature range of the transmitter (and also the Kiln Data Collector) is -20C to +85C (0F to 185F).
Your control system should limit the temperature in the kiln to a maximum of 85C/185F.
However, manual control of heat and spray can lead to temperatures in excess of 85C/185F.
Extended use of the kiln data modules above 85C/185F will damage the cicuitry.
Temperatures above 100C/212F are not only damaging but also dangerous.

**WARNING: FIRE, EXPLOSION AND BURN HAZARD!**

Every Transmitter contains a Lithium Battery which is not replaceable or rechargeable.
Transmitters MUST NOT be connected to anything else but the wafer in an EMC-Station or wood to prevent the battery from getting charged.
Do not disassemble Transmitters, heat above 100C (212F) or incinerate.

IMPORTANT NOTES:

Transmitters must be deactivated whenever shipped by Air, to make sure they don't interfere with Air traffic communications. Shorting out the sensor leads will deactivate the Transmitter. This will also extend battery life in times when the transmitters are not used.

Transmitter function should be checked at least every 3 months or whenever false readings are suspected, using a MC/EMC Test unit.

At the end of the life cycle of the Transmitters, dispose in accordance with all Federal, State and Local regulations.

KILN DATA COLLECTOR

INSTALLATION OF DATA COLLECTORS IN THE KILN:

Mount one collector on one side of the lumber packs (front of kiln) and one on the other side (back of kiln). These are the best locations to make sure the signals of all transmitters are being picked up.

Do not mount the collectors in the corners of the kiln. This is a bad place for radio frequency reception.
Make sure no metal objects (like baffles) are shielding the collectors from the transmitters in the kiln.

Front Kiln Data Collector:
This collector can be mounted above the front door of the kiln, somewhere in the middle. Do not mount it above the level of the fan deck.
Mount the collector in such a way that the antenna is pointing downwards, not sidewards.

Back Kiln Data Collector:
Mount this collector somewhere in the middle of the wall, in about the same elevation as the transmitters are placed in the lumber.
Mount the collector on a small metal plate and mount this plate with a 90 degree angle to the wall.
The antenna is then pointing upwards, not sidewards. This gives better results than mounting the collector flat on the wall.

Connect the 4 conductors of the Kiln Data Collector as described below:

| | |
|---|---|
| Red (1st pair): | +24V |
| Black (1st pair): | GND |
| White (2nd pair): | RS485 Rx/Tx+ |
| Blue (2nd pair): | RS485 Rx/Tx- |

Use shielded cable for this connection.
The shield must be connected to earth ground at the host.

REGULATORY INFORMATION

FCC Compliance Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions, may cause harmful interference to radio communcations.
However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by monitoring reception with the equipment being active and inactive (see below), try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult your dealer or an experienced radio/TV technician for help

This equipment can be deactivated by powering down the Kiln Data Collector and shorting out the sensor leads of the Kiln Data Transmitters (which will disable the Kiln Data Transmitter).

Warning: Changes or modifications to the equipment that are not expressly approved by the manufacturer could void the user's authority to operate the equipment.