

# Iceland Engineering Training

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# System Overview

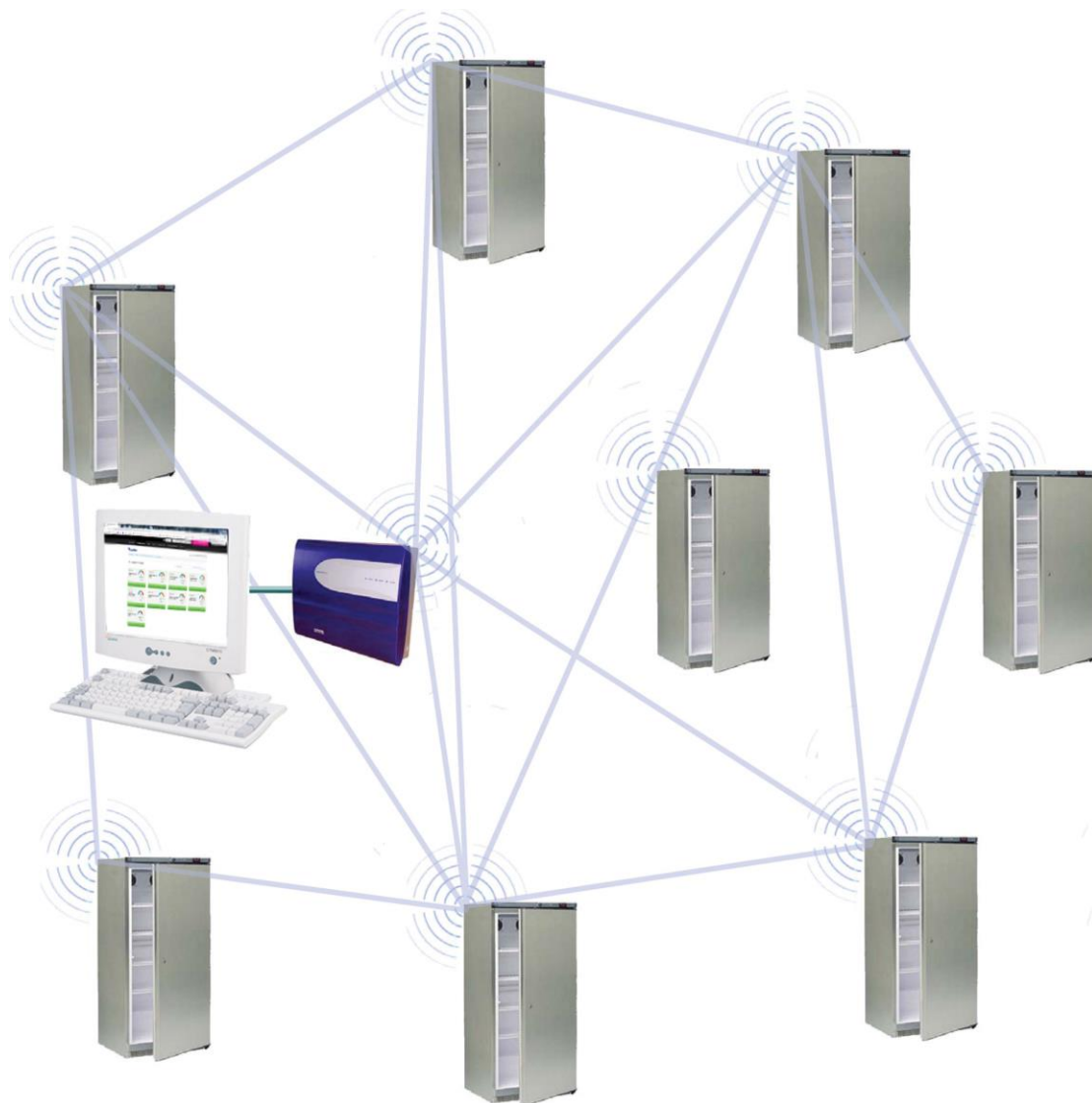
## 1.1 Mains Comms



## 1.2 Hardwired (Mains Comms)



## 1.3 Pathfinder RF



## 1.4 System Components and Function

### Probes

- Basic two-wire resistance devices.
- Present the slave with an electrical resistance proportional to temperature.
- Simulation packs are air probes damped by a physical food simulant medium.

### Slaves

- Microprocessor based device.
- Converts probe resistance into a data value for transmission to the NMU.
- Data only transmitted when requested by the NMU.
- Have a unique address.

### NMU

- Continually polls Slaves
- Converts raw slave data into temperature and applies calibration.
- Processes alarm conditions.
- Works independently of the PC.
- Holds a local database of temperatures and alarms whilst PC is offline.

### PC Software

- Allows the user to configure the system.
- Allows user to manage alarms.
- Provides an audit trail.
- Holds a local database of temperatures, alarms and activity.

## **2.0 Monika PC**

### **2.1 Overview**

- Navigation
- Live View
- Graphs and Reports
- Event Logs

### **2.2 System Management**

- Managing Users
- Managing Slaves and Locations
- Managing System Parameters

## 3. 0 Diagnostics & Fault Finding

### 3.1 Diagnostic Process

- Use Monika PC to narrow down the fault - graphs, reports timeframes, intermittent or constant fault?
- Work logically through the problem to isolate the cause.
- Is it a Monika or refrigeration related issue?
- Is it an engineering issue? The user might be
- Think before changing a component - is it necessary?
- Check for a known fix and apply appropriately.

Reported Fault	Possible Causes
All location non comms	NMU
	System Setup
	EMC Interference
One or more individual locations non comms	Slave
	Setup
Probe Fault	Probe
	Probe wiring
	Slave
Error Message on PC/Monika System	PC/OS problem
	Misinterpreted system or Monika message on screen
	Message relating to one or more fault conditions listed above

## 3.2 Diagnostic Tools

- Monika PC
- Multimeter
- Carry a spare slave with a known ID for testing purposes

## 3.3 Common Issues and Procedures

### Trouble-shooting Temperature Probes

The most likely cause of probe problems is poor connections, so these should be checked first before assuming that the probe requires replacement.

Fault	Possible Cause	Action	Note
Temperature slightly too high or too low	Calibration	Check calibration	DO NOT calibrate to compensate for a refrigeration problem! Cal figures should typically only be $\pm 3$ counts.
Permanent or intermittent open circuit	Broken poor connection at slave	Remake connections referring to revised method	
	Broken or poor connection at probe		
Permanent or intermittent short circuit	Short at probe connection		
	Short at Slave connection		
Temperature excessively high	Internal probe fault	Replace probe and re-test	Most common failure mode
Temperature excessively low	Internal probe fault		Uncommon

The normal mode of failure for Simulation Packs and air probes is for the resistance of the probe to dramatically reduce causing a high temperature reading (typically around +45°C)

If temperature probes are reading far above the temperature of the cabinet being monitored then it is likely the probe has failed and should be replaced.



Use a multimeter to test the resistance of a suspect probe/Simulation Pack with reference to the table below e.g. for a probe fitted to an Iceland chiller running at 4°C you would expect a resistance of around 6K Ohms.

Note: ensure that you are not holding the ends of the test probes or probe wires when taking the reading as you body's resistance will affect the reading.

Typical Resistance Values for Monika Simulation Packs and Air Probes	
Temperature (°C)	Resistance (K Ohms)
-20.0°C	21.8
-19.0°C	20
18.0°C	19.4
-17.0°C	18.3
-16.0°C	17.3
-15.0°C	16.4
-14.0°C	15.5
-13.0°C	14.6
-12.0°C	13.8
-6.0°C	10
-5.0°C	9.5
-4.0°C	9
-3.0°C	8.5
-2.0°C	8.1
-1.0°C	7.7
0.0°C	7.3
1.0°C	6.9
2.0°C	6.6
3.0°C	6.3
4.0°C	6
5.0°C	5.7
6.0°C	5.4
7.0°C	5.1
44°C	1
55°C	0.6

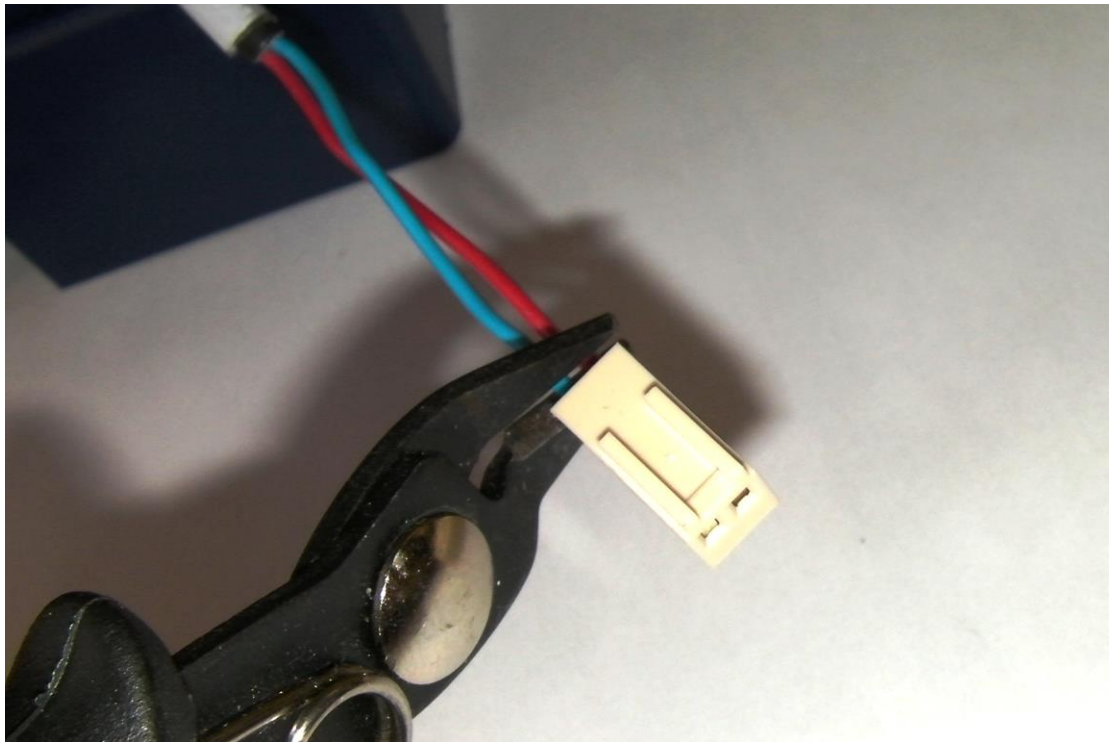
### **Revised Simulation Pack Connections**

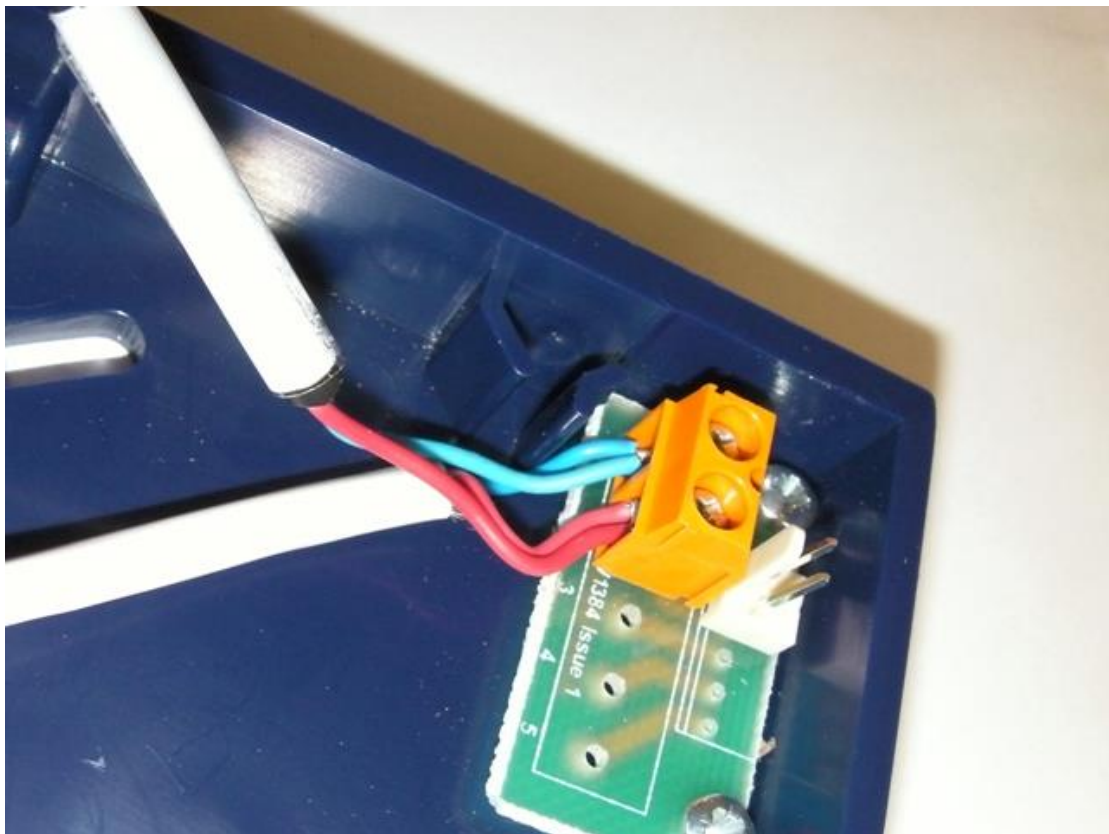
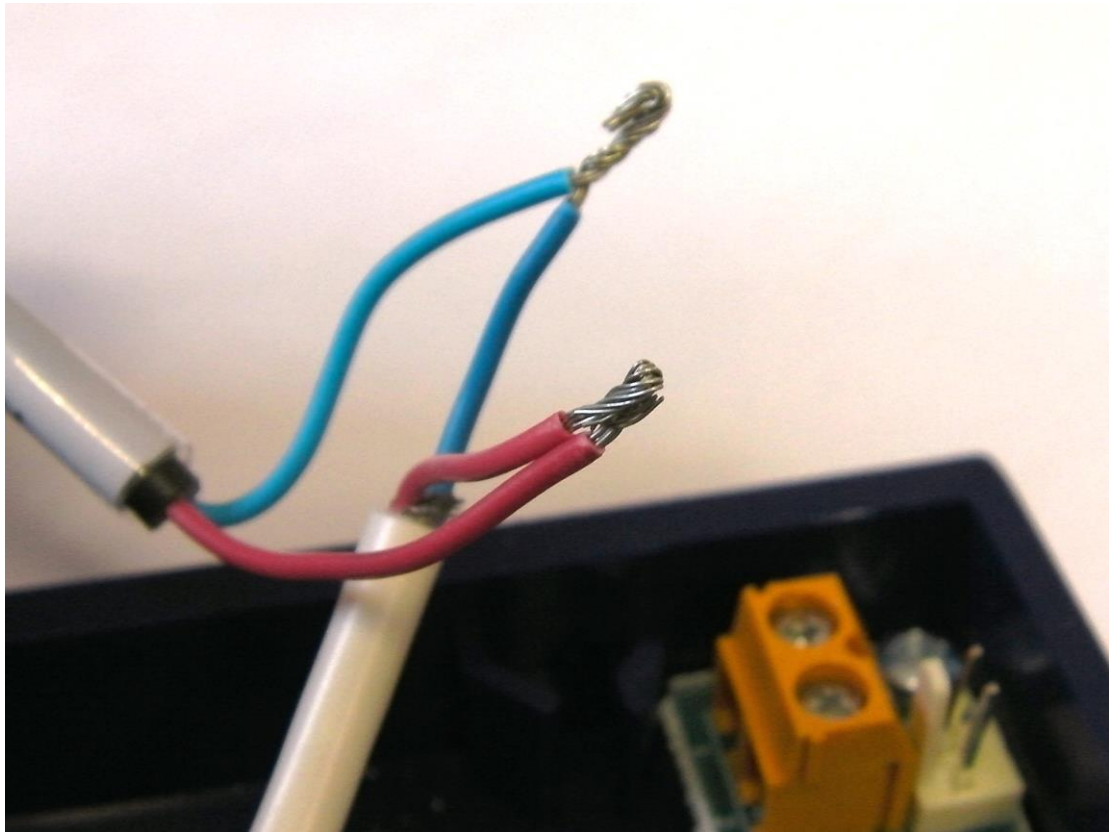
To improve the reliability of the Simulation Pack a revised method of connection has been introduced which eliminates the two-way Molex connector.

This method should be used when installing and replacing any Simulation Pack.

### **Procedure**

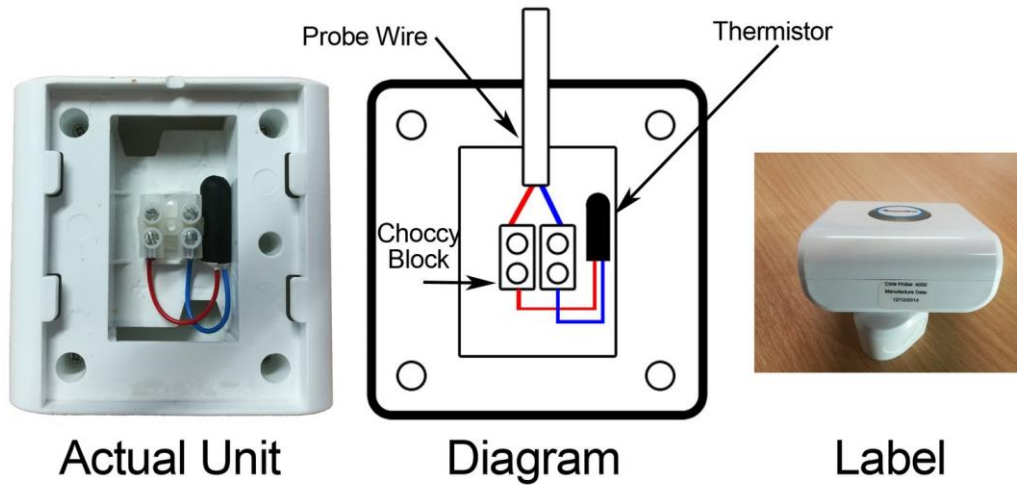
1. Cut off the Molex connector from the Simulation Pack





## Core Probe Connections

Here are the contents of a core probe and how to replace the internals on a Monika Core Probe (4050)

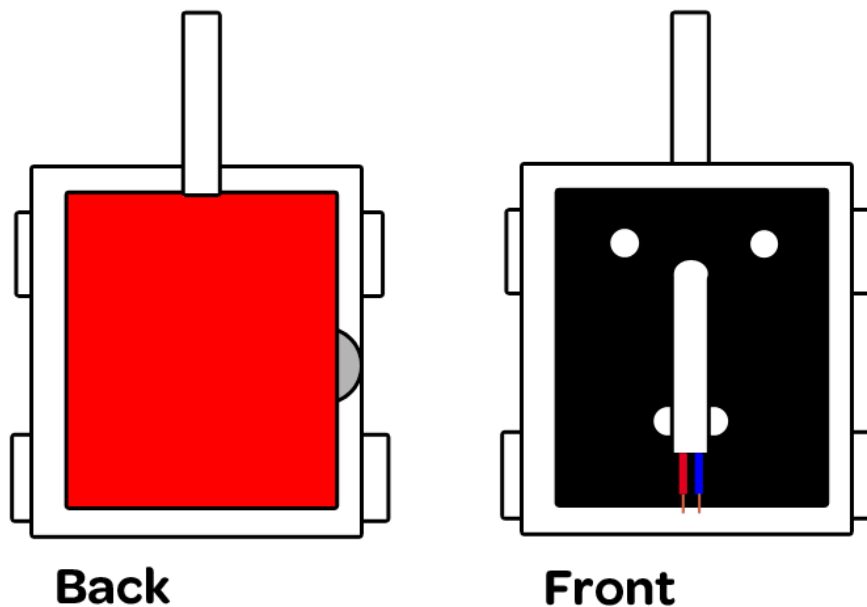


### Replacing the Thermistor

Simply unscrew the choccy block on the side that retains the thermistor, remove the original and replace with the new unit in the original position.

### Routing the Probe Wire

This Diagram shows how to push the probe wire through the central hole on the back plate and stick foam pad to allow the probe wire to be connected to the "choccy block" inside the unit.



## Trouble-shooting the NMU

Symptom	Possible Cause	Action	Further Action
Cannot connect to NMU	No power to NMU	Check NMU is powered on	
	Wrong COM Port selected	Check the right COM Port is selected in Monika PC	
	Faulty Serial Lead	Check lead is connected correctly and/or test lead continuity.	
	Serial connection not selected	Check jumpers S1 and S2 are connected on NMU base board	Check no other Comms jumpers are connected
	USB connection not selected	Check jumpers S3 and S4 are connected on NMU base board	Check no other Comms jumpers are connected
	LAN connection not selected	Check jumpers S5 and S6 are connected on NMU base board	Check no other Comms jumpers are connected
	NMU "Locked up"	Reset the RAM chips on the processor board of the NMU (see below for instructions)	If all above fails replace NMU
NMU Connection drops-out	Computer too busy to service Monika PC	Check no software on the computer is causing interference such as a Virus Scanner	Check with IT if updates or maintenance is done on the PC during times when connection drops
No Slave Communication	NMU Gateway not set as the "SINK"	Use your Telegesis Terminal to determine if the RF Module is setup to be a "SINK"	
	NMU Gateway not on same PAN as Slaves	Use your Telegesis Terminal to determine if the RF Module is on the correct PAN	
	Monika LAN Service not running	Go to the computer running the Monika LAN Service and check the debug output is showing NDATA	
	RF Antenna not connected	Check the Antenna is connected to the NMU	If all other causes have been investigated, check the antenna lead is connected to the RF Module on the baseboard of the NMU – be careful lifting the RF Module off the board
	Power supply issue within the NMU	Check with a volt meter that you are getting 10v and 5v on the base board (see below for instructions)	
NMU continually alarms after power failure	Battery PIN not connected	Check the backup battery is connected	Check the voltage on the battery – should be 3.6v