iCon

System Installation Manual

Ver 18.06.01.xx

Title Page

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Product Support Department
Comeragh Controls Ltd
Upper Irish Town
Clonmel
Co. Tipperary

WARNING!

DO NOT ATTEMPT TO INSTALL THE ICON WITHOUT SWITCHING OFF THE ELECTRICAL SUPPLY.

A QUALIFIED ELECTRICIAN AND/OR PLUMBER SHOULD CARRY OUT INSTALLATION OF THE ICON.

POWER MUST BE DISCONNECTED BEFORE OPENING THE I/O CONTROLLER ENCLOSURE.

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1. Introduction

1.1 Scope

The scope of this document covers the installation of the ICON Heating Control System.

1.2 Purpose

The purpose of the document is to provide the relevant information to enable the distributor install the ICON Heating Control System.

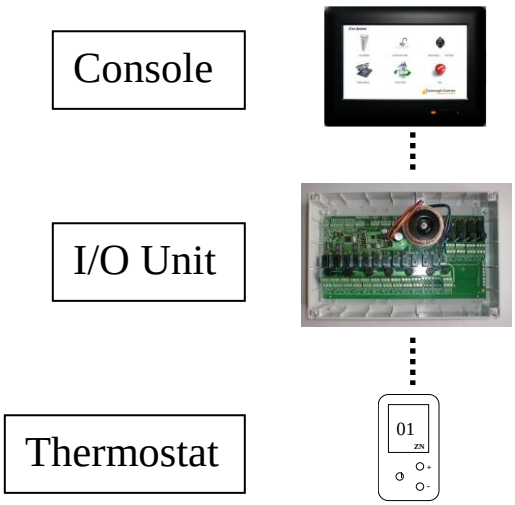
1.3 Product Description

The ***ICON*** is a complete heating & hot water management system. The system controls energy sources such as a boiler, geothermal pump, and solar panels through to energy exchangers such as underfloor heating, radiators and hot water cylinder in a single package. Management is from a central console, which schedules up to 32 zones.

1.4 System Components

The system comprise of the following components

System Component	Model Number	Description
Console	CC757	The Console is the central point of control and programming.
Thermostat	CC764 CC765	Serial Thermostats monitor temperature in a zone and communicate over a wired serial network.
I/O Controller or, Logic Controller	CC771	The I/O Controller is the wiring point to all pumps, 2 port valves, actuators etc.



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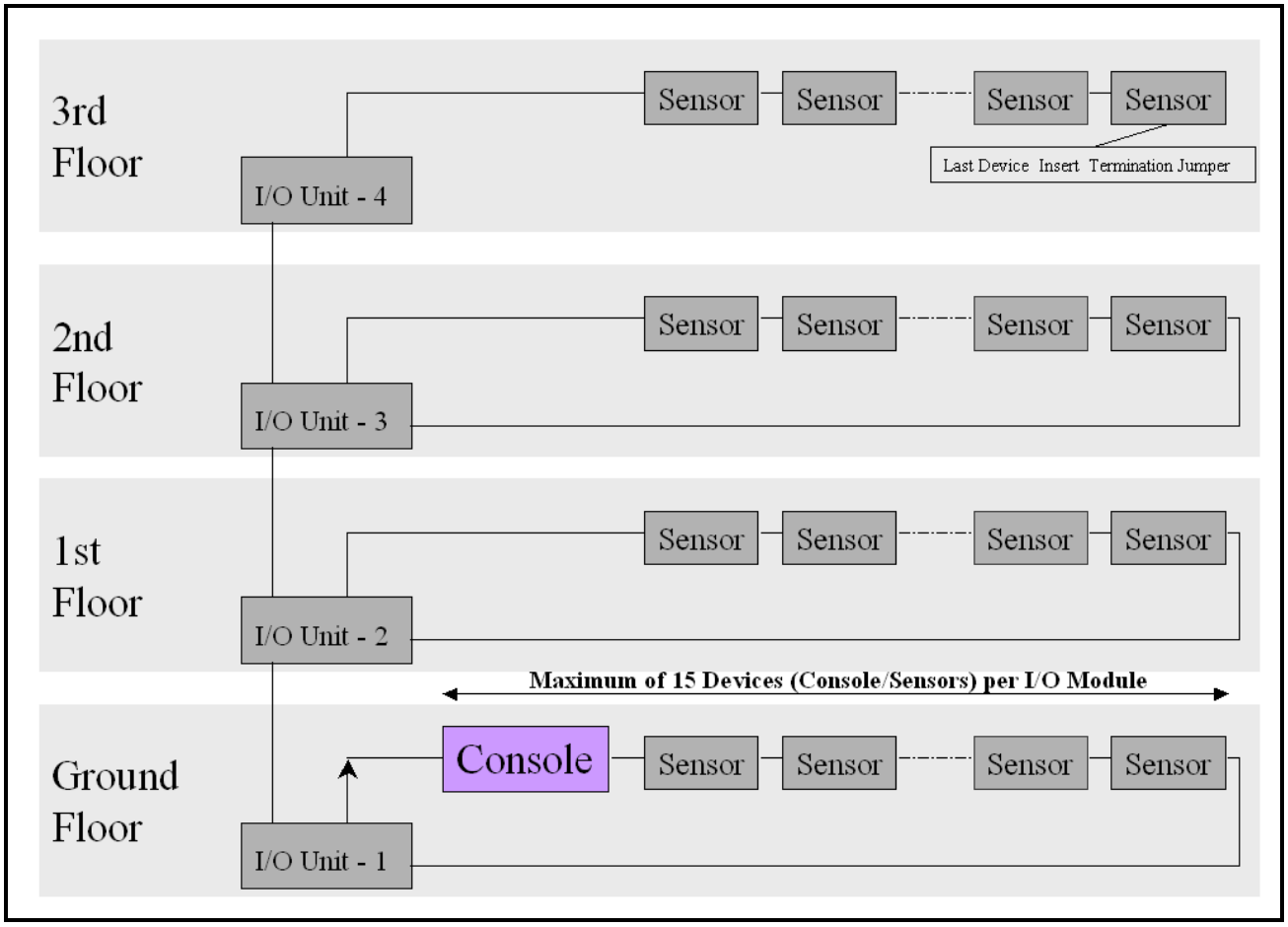
2. System Wiring

2.1 Communication Wiring (I/O Model R16)

2.1.1 Communication Wiring Layout



Notes:

- **Maximum of 15 Devices (Console / Sensors) per I/O Module**
- **Last Device Insert Termination Jumper**

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2.1.2 Cable Type

0-250 meter installations	**(Domestic Applications)**
Cable Type	General Data Cable (Alarm)
Colour	Yellow / Blue / Black / Red
Number Of Cores	4
Core Strands	24awg
Cable O-D	3.4mm
Conductor Material	Tinned Copper

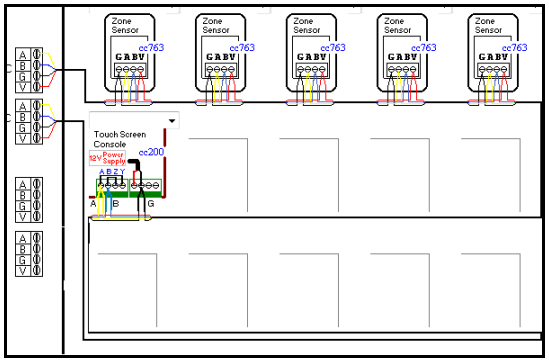
250 –1200 meter installations	**(Commercial Applications)**
Cable Type	General Data Cable (Alarm)
Colour	Yellow / Blue / Black / Red
Number Of Cores	4
Core Strands	24awg
Cable O-D	3.4mm
Conductor Material	Tinned Copper

250 –1200 meter installations	**(Commercial Applications) (High Electrical Noise Environment)**
Cable Type	RS485 Data Cable
Number of Cores	4
Core Strands	24awg
Cable O-D	7.1mm
Conductor Material	Tinned Copper
Beldon No.	8134

Supplier

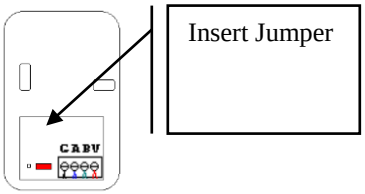
RS Components
Web: www.rswww.com
Tel: UK Orderline: 08457 201201
Tel: UK Online Help: 01536 444222
or any major electrical supplier

2.1.3 Communication Connection – Pin Outs **(I/O Model R16)**



2.1.4 Termination

Last Device - Insert 120 ohm Termination Jumper



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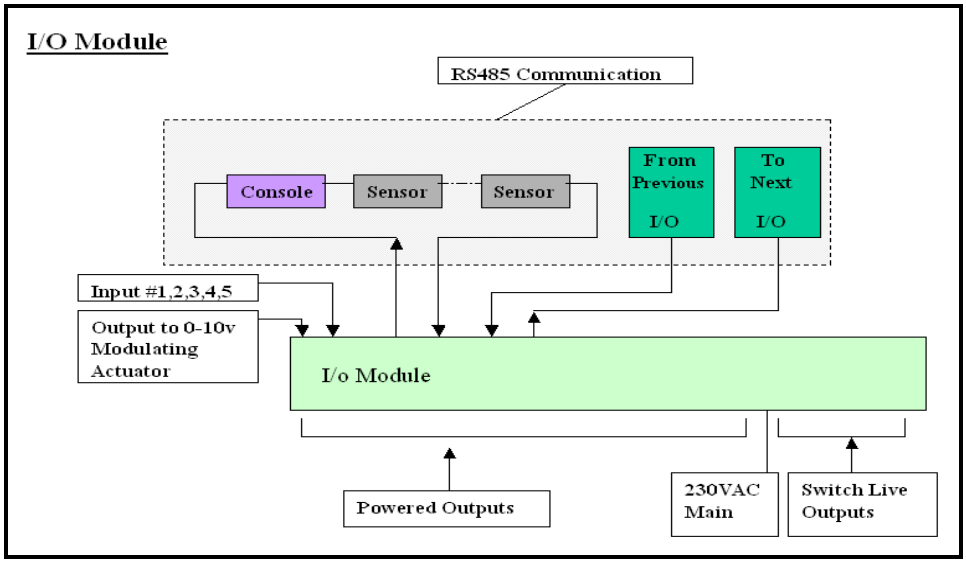
2.2 Logic I/O Unit Wiring (I/O Model R16)

2.2.1 I/ O Wiring (Model R16)



Powered Outputs	Output Voltage	220v AC or 24 v AC
	Fuse	Pairs
	Max Load	2 Amps
	Terminations Per Relay	3
Switch Live	Max Load	4 Amp
	Facility to convert to Individual Powered Outputs	Yes
Inputs	Type	Volt Free
	Satisfied (Short Circuit)	S/C
	Not Satisfied (Open Circuit)	O/C
Modulation Actuator Output (0-10v)	Output	0-10v
	Supply	24v AC (+/- 10%)
	Max Supply Load	3 Watts
Communications	Communications	RS485
	Range	1500 M
	Max qty linked to a console	1 to 8
Supply Voltage	Supply Voltage / Frequency	220v AC (50/60 Hz)
	Fuse (Slow Blow)	1Amp
Dimensions (In mm)		D (60), L 300, H 200
LED Indicators		Yes
Boiler Interlock		Yes

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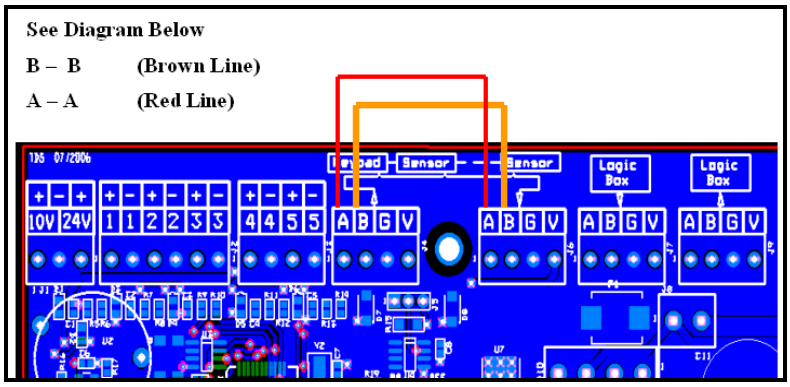
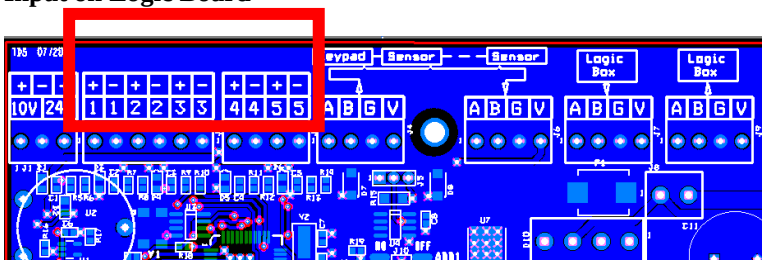
2.2.2 Wiring a Logic Box with no Sensors or console (I/O Model R16)

If no console or sensor connected to a logic box the RS485 network connection must be jumper



2.2.3 Wiring Inputs

Input on Logic Board



Comments
All inputs must be VOLT FREE

Operation
Inputs can be use at Activation, Overrides or Enables
Input are operate similar to stat

Example:
Input signal from cylinder stat is used to overriding a pump, lets use input I on Logic Box 1 (I1:1)
If the cylinder is not satisfied the input should be short circuited (e.g. input [1+] [1-] joined)
When the cylinder is satisfied the input should go open circuit (e.g. input [1+] [1-] unconnected)

Summary
Call for Heat = Short Circuit
Satisfied = Open Circuit

Technical Comment
The logic board set the input High (+5v).
If Open Circuit or nothing attached the input are activate
If Closed Circuit the input is de-activate (Satisfies)

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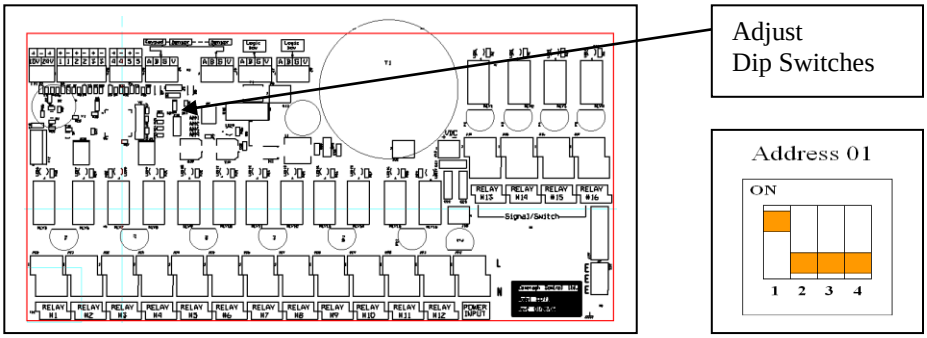
2.2.4 Addressing I/O Module (I/O Model R16)

I/O Addressing



Dip Switch Table

Logic Box Number	Dip Switch Settings			
	1	2	3	4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON
5	ON	OFF	OFF	ON
6	OFF	ON	OFF	ON
7	ON	ON	OFF	ON
8	ON	OFF	ON	ON

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3. Touch Screen Console

End User Operation –See Document
Touch Screen - User Manual

Engineering Manual –See Document
Engineering Manual

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4. Temperature Settings

Zone Type & Function

	Zone Settings					Addational Type settings				Master Settings				Probe		Comments
Zone Types	ufh or U-Probe					Rad / DHW / Probe / Sch				Timer	Heating All On	Heating All OFF	Frost Protection (FP)	Max	Min	
	Sch ON	Sch OFF	Stop	Disabe	Boost	Off for Today	On 1 Hr	On 2 Hr	On 3 Hr							
ufh U-Probe	SP	SP-SB	Hold at SB	FP	SP+DB	n/a				Follow Sch	Hold at SP	Hold at SB	FP	overide	overide	Follow ufh operation
														n/a		
Rad Probe	SP	Off SP	n/a	FP	SP+DB	Off SP for Today	On 1 Hr - SP	On 2 Hr - SP	On 3 Hr - SP	Follow Sch	Hold at SP	Hold at Heating Off SP	FP	overide	overide	Follow Radiator
														n/a		
DHW	SP	Off SP	n/a	FP	n/a	Off SP for Today	On 1 Hr - SP	On 2 Hr - SP	On 3 Hr - SP	Follow Sch			FP	n/a		DHW
Sch	ON	OFF	OFF	OFF	ON	OFF	On 1 Hr	On 2 Hr	On 3 Hr	Follow Sch			OFF	n/a		Time only

	Cooling				
Zone Types	Passive	Active			Comments
	CI	F1	F2	F3	
ufh U-Probe	>SP+DB	≥SP+DB+F1	≥SP+DB+F2	≥SP+DB+F3	Independent of schedule. (Cooling enabled at Sensor)
Rad Probe					
DHW	n/a				n/a
Sch	n/a				

Zone Temp Range

Zone Types	ON		OFF		Comment
	Max (Default)	Min (Default)	Max (Default)	Min (Default)	
ufh U-Probe	SP Max (32)	SP Min (16)	SB Max (8)	SP Min (3)	SB Tracking
Rad	SP Max (32)	n/a	Heating Off SP (2)		Off = Off SP
Probe	Probe SP Max (99)				
DHW	DHW SP Max (70)		FP		
Sch	n/a - Time Only				Time Only

Abbreviations	
SP	Set Point
SB	Set Back
FP	Frost Protect
CI	Cooling
Sch	Schedule

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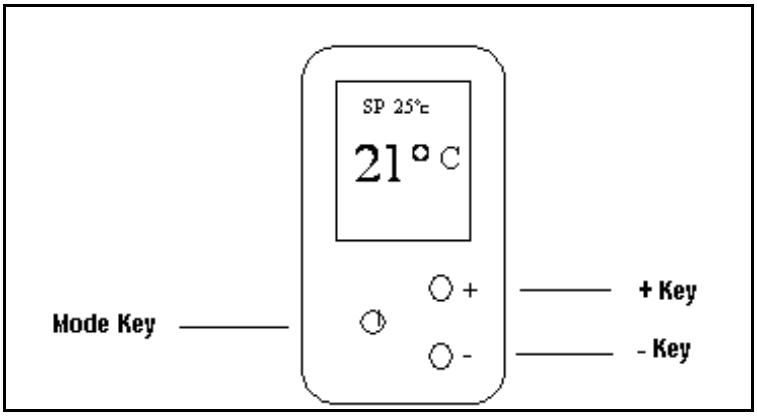
5. Sensor

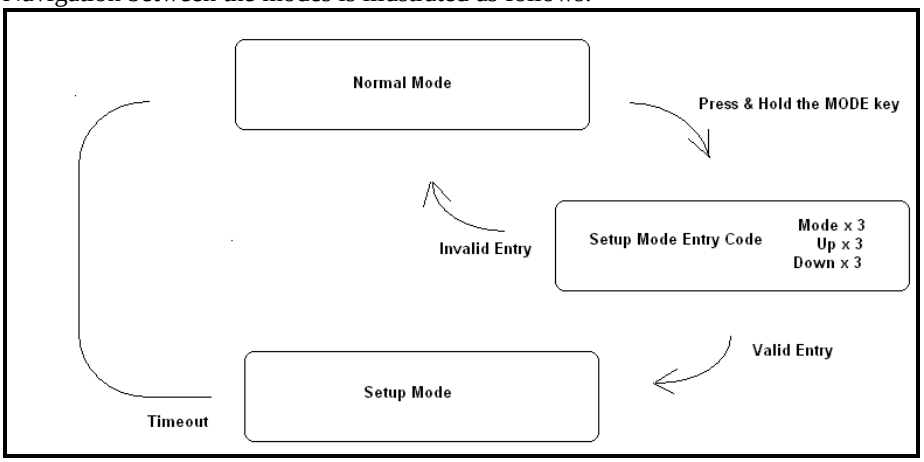
Sensor Buttons



There are 2 Modes of Operation:

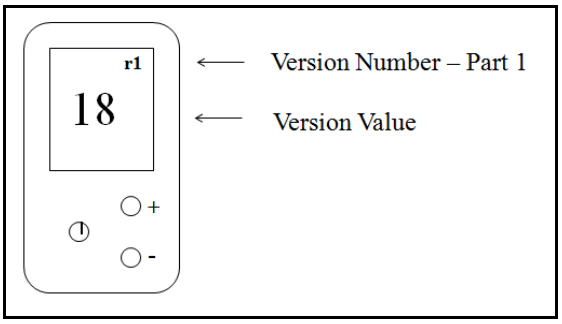
1. Normal (End User),
2. Setup

Navigation between the modes is illustrated as follows:



Version Number

Version data is displayed in the top right corner of the display when pressing the mode key during the setup entry code mode. The version information is r1.r2.r3



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5.1 Normal (End User) Mode of Operation – UFH, RAD & Probe type sensor

There is only one difference between a UFH and RAD type sensor. The setback parameter limit is greater for a RAD sensor. The probe type sensor uses channel 2 as the temperature source and has no screed option.

The set-point, setback and Boost-heat may be increased and decreased by pressing the "+" and "-" keys. The mode key is used to select set-point, setback and Boost-heat.

Changes to mode, set-point, setback or Boost-heat are only possible when the zone has been set (greater than 0) and communications with the sensor have been established.

Pressing the Mode key will change the Sensor State from Timer (Heating Only) to Timer (Heating & Cooling – when cooling is enabled at the console by setting to cooling Minimum setting to a value greater than "0") to STOP to DISABLE. As the mode key is presses the display will appear as follows:

Timer (Heating Only)

Timer (Heating & Cooling)

"CL" symbol is displayed momentarily – Cooling Enable in this Zone.

STOP (Heating in Set Back, Cooling OFF)

DISABLE (Heating in Frost Protection, Cooling OFF)

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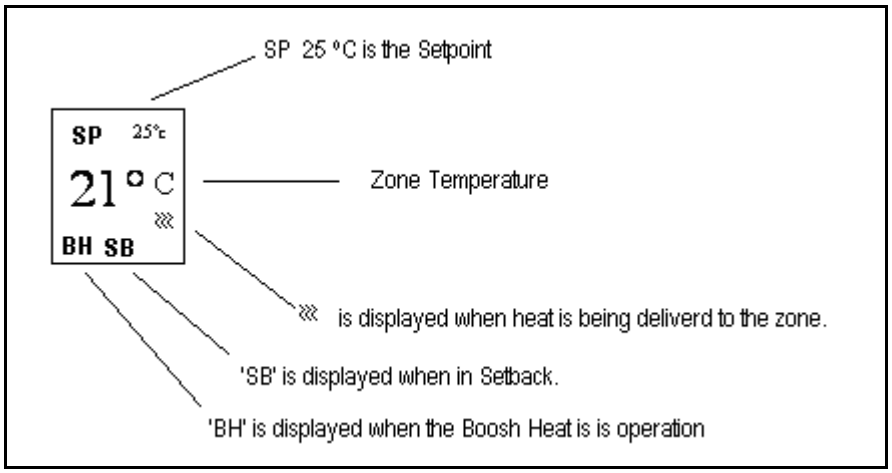
The symbols in the various modes are described in the following table:

Sensor icons



Ch 1& 2 The temperature source (channel 1 or 2) that is displayed is set by the type of the thermostat.

Type	Channel
UFH	1
RAD	1
PROBE	2
UPROBE	2
DHW	2

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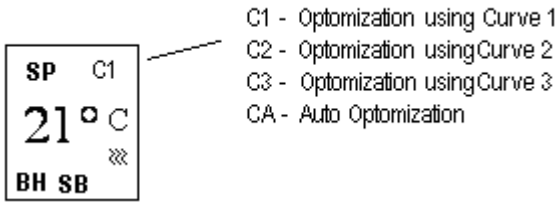
Optimization. The Symbols ‘C1’, ‘C2’, ‘C3’ and ‘CA’ are displayed when the sensor is in optimization.



Optimization is the control of zone temperature in order to pre-heat according to a selected optimization curve when the zone is in the Timer mode (not Setback or Disable).

An optimization curve controls temperature gradient prior to the scheduled ON time. Curves differ with respect to duration.

Curve 1		Curve 2		Curve 3	
Time Offset (mins)	**Temp Offset (Deg C)**	**Time Offset (mins)**	**Temp Offset (Deg C)**	**Time Offset (mins)**	**Temp Offset (Deg C)**
30	1.0	30	1.0	30	1.0
60	2.0	60	2.0	60	2.0
		90	3.0	90	3.0
		120	4.0	120	4.0
				150	5.0
				180	6.0

Example
A zone, using optimization Curve 1, is scheduled to come on a 5pm and the Set-point is 21°C. The heating requirement is driven by the optimization adjusted Set-Point as follows:

Time	**Optimization adjusted Set-Point**
5:00pm	21.0°C
4:30pm	20.0°C
4:00pm	19.0°C
3:30pm	18.0°C

If an external stat is used in the system then it will override the programmed curve selection when the external temperature drops below certain thresholds.

Auto optimization

Zone optimization may also be set to AUTO mode. In this mode the sensor uses Curve 3 but adjusts the index into the table based on the thermal inertial of the zone. If the temperature is greater than the set-point at the time the zone is scheduled to turn on, then the zone will be turned on 30 minutes later at the next scheduled ON time. If the temperature is less than the set-point at the time the zone is scheduled to turn on, then the zone will be turned on 30 minutes earlier at the next scheduled ON time.

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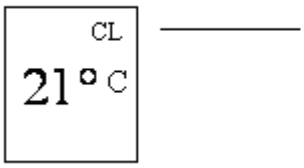
Cooling

If the sensor enters the Cooling mode of operation the display becomes:



"CL" Flashes when cooling is active

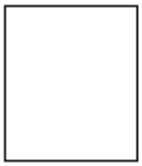
Cooling is available at the sensor via the mode key if cooling is enabled at the console.

Stop

Only the 'SB' symbol is displayed

Normal timer scheduling is ignored and the sensor forces the zone to stay above the set-back limit.

Disable



The diplay is blank

Normal timer scheduling is ignored and the sensor forces the zone to stay above the frost protection setting

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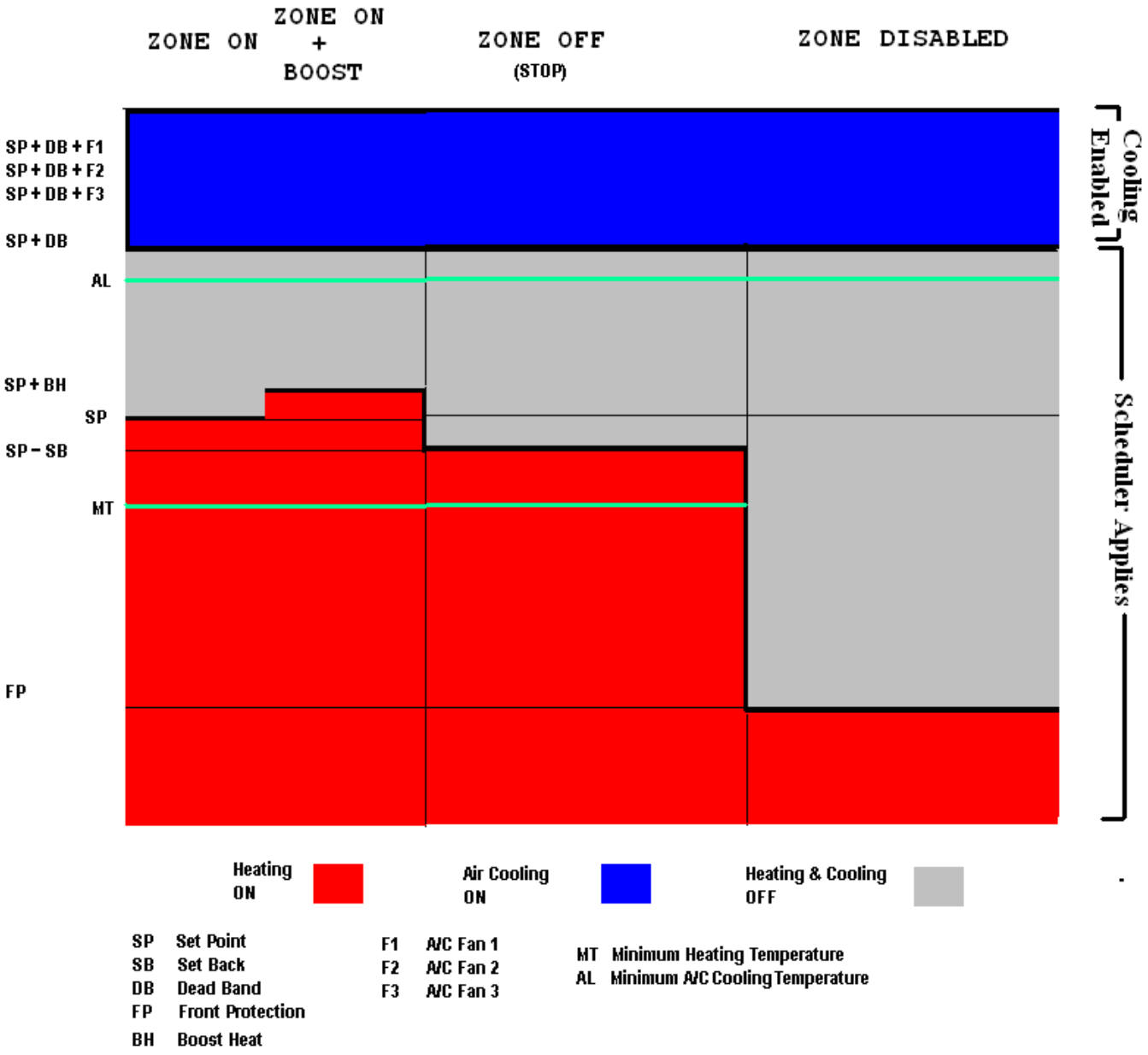
UFH, RAD & PROBE State Control

Zone control is essentially identical for UFH, RAD and PPROBE zone types. A screed limiting parameter may be applied to UFH and RAD zone types. Minimum Heating Set-point does not apply to the PPROBE zone type. The following diagram illustrated the operation for the ON, OFF and DISABLED zone states.



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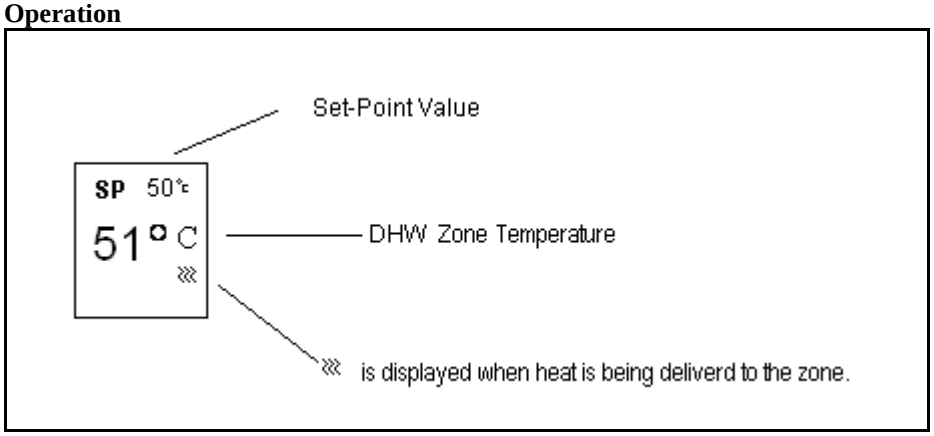
Normal Mode of Operation – DHW type sensor

There are 2 normal sates: “Timer” and “Disable.” The display state is changed by pressing the MODE key.

State **Operation**

Timer



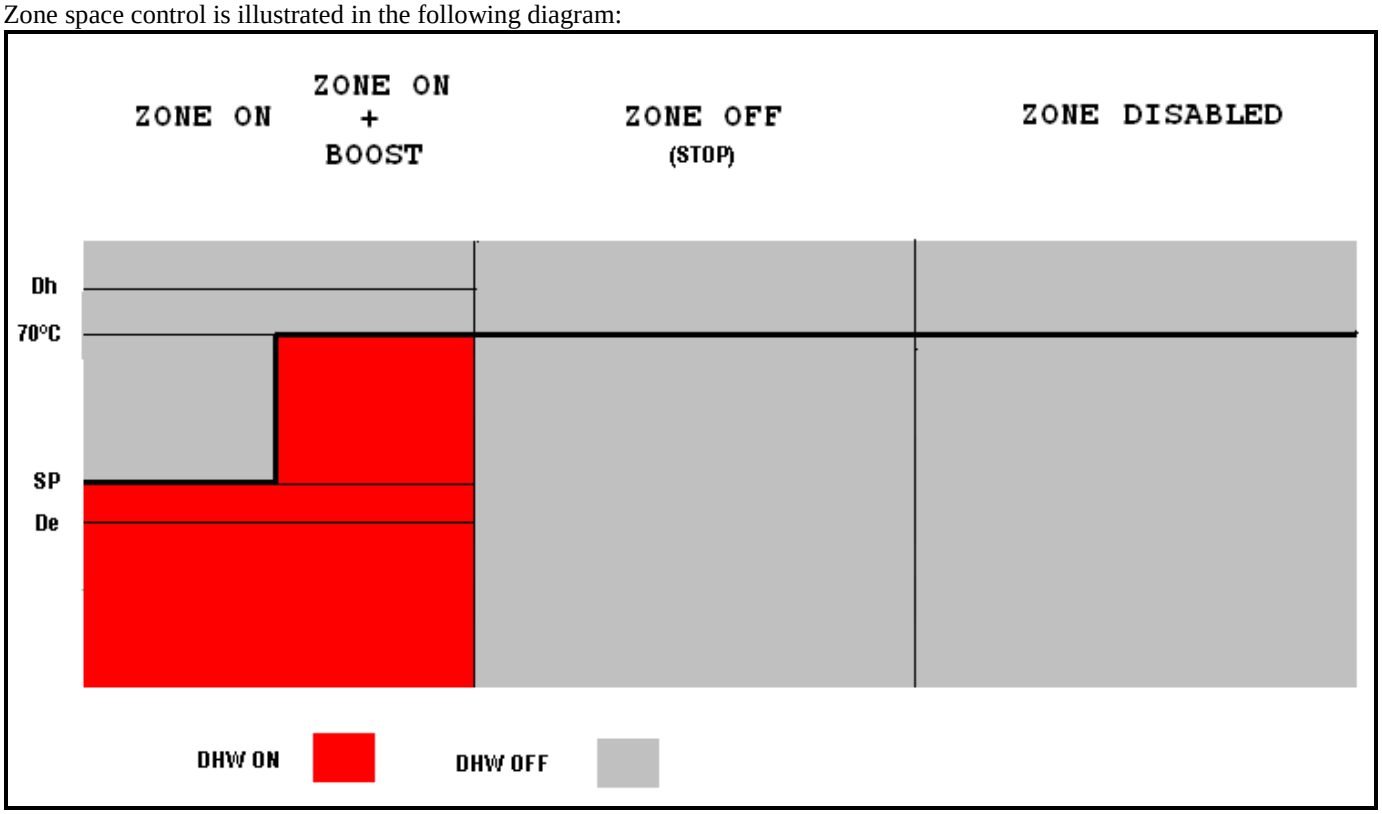
The temperature source channel 2

The Set-Point limit IS: 50

Disable Display is blank. Temperature control is disabled.

DHW State Control

Zone space control is illustrated in the following diagram:



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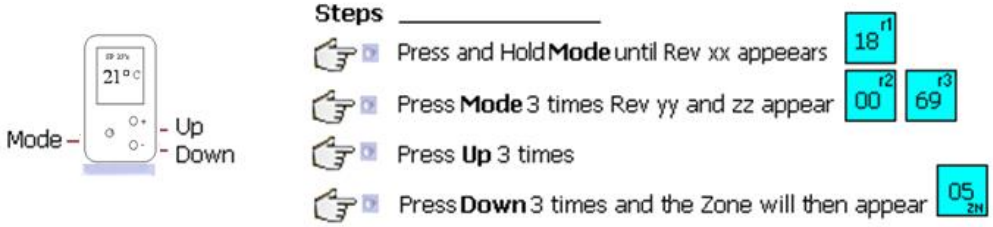
5.2 Sensor (cc764) Engineering Level

To Enter the Engineering Mode



To Move Between Parameters

To Move Change a Parameter Value

Sensor Parameters

Parameters

Sensor Type

St 00

00	Zone
01	Aux Sensor
02	Zone + Secondary Zone (-b) + Relay
03	Zone + Relative Humidity

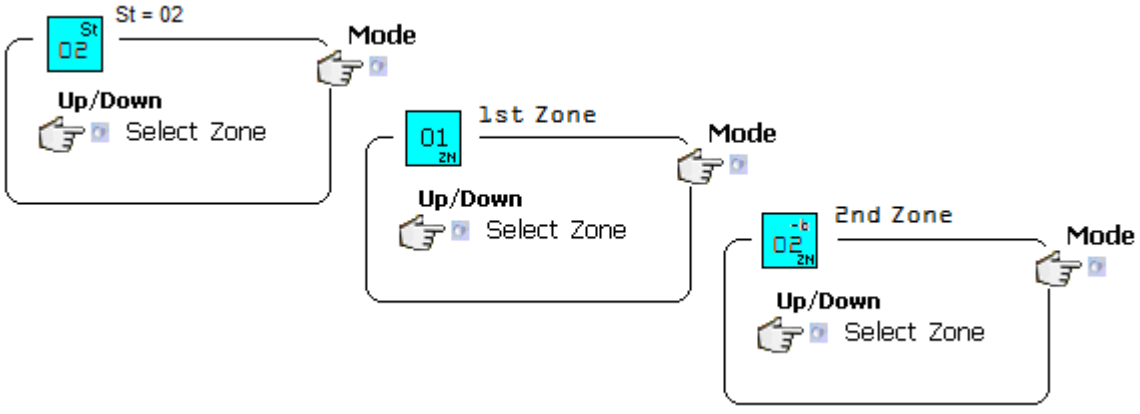
Parameter Navigation and Modification

Press **Up** to INCREASE

Press **Down** to DECREASE

Press **Mode** to change to another parameter

Example: Setup Sensor as a Zone Sensor with Secondary Zone



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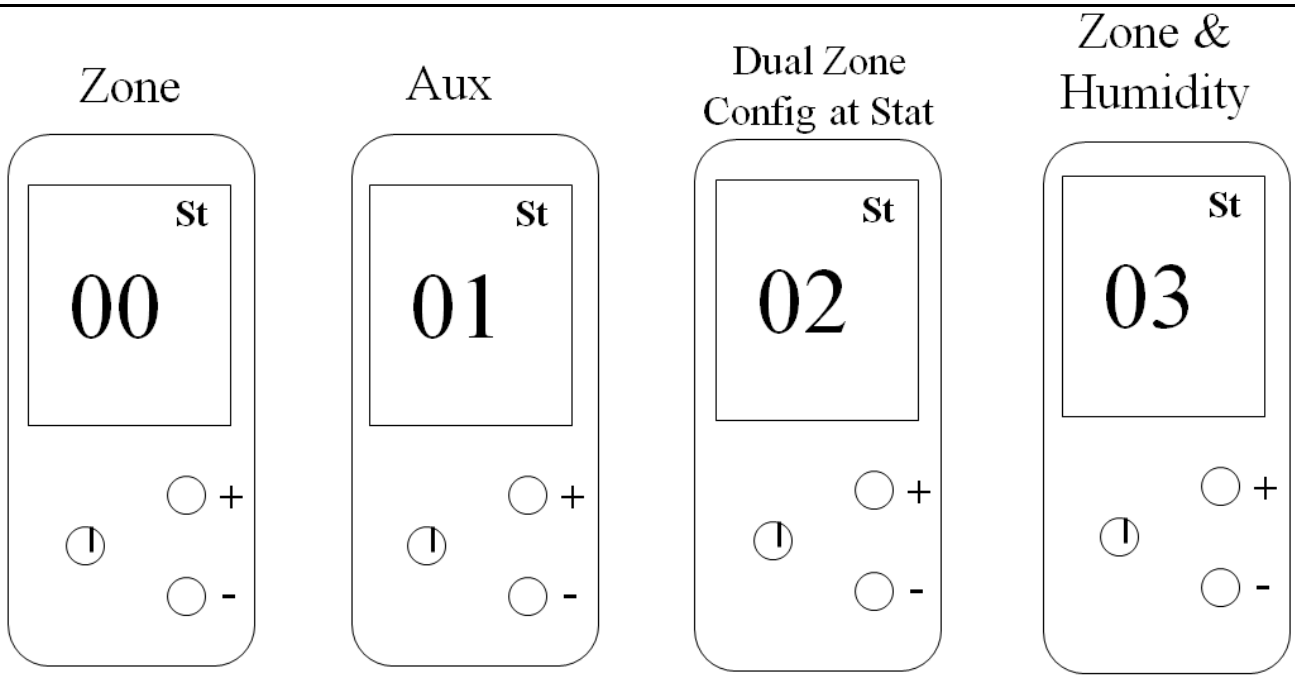
Sensors Types (Ver 18.04.00 and beyond)



Set St to 0
for Zone Sensor
Ufh
Rad
Probe (operate as rad)
Uprobe (operate as ufh)
DHW
Schedule (No Stat Required

Set St to 1
for Aux Sensor

Set Sr(Stat Ref) to 1-9
for Aux Sensor # 1 -9
Aux Type:

External	E
Flow	F
Return	r
Temp	t

Set St to 2
for Dual Zone
Sensor

-b = 2nd ch of Dual
ZN display on screen
when 2nd zone SP &
Temp displayed

Set St to 3
for Air & Humidity
Not available

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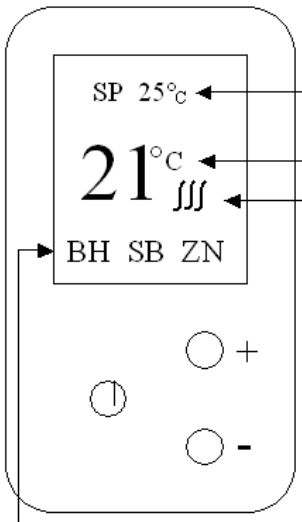
6. Stat Symbols

Home Owner (Normal Mode)

Home Owner (Normal Mode) Icons



Home Owner (Normal Mode)
SP = Set Point
C1= Curve 1 optimisation
C2= Curve 2 optimisation
C3= Curve 3 optimisation
CA= Auto optimisation
PS = Pipe Stat
Et = External Temp Stat
Cl= (Static) Cooling Mode, (Flashing) Calling for Cooling

Air or Probe Temperature

∫∫∫ = Heating On

Home Owner Mode
Running Mode (Grey Background)
SB = Set Back Mode – Ignore Schedule
Blank = Frost Protection Mode
Edit Mode (Blue Background)
BH = Boost Heat
ZN = Zone Number – Can not be change by Home owner

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