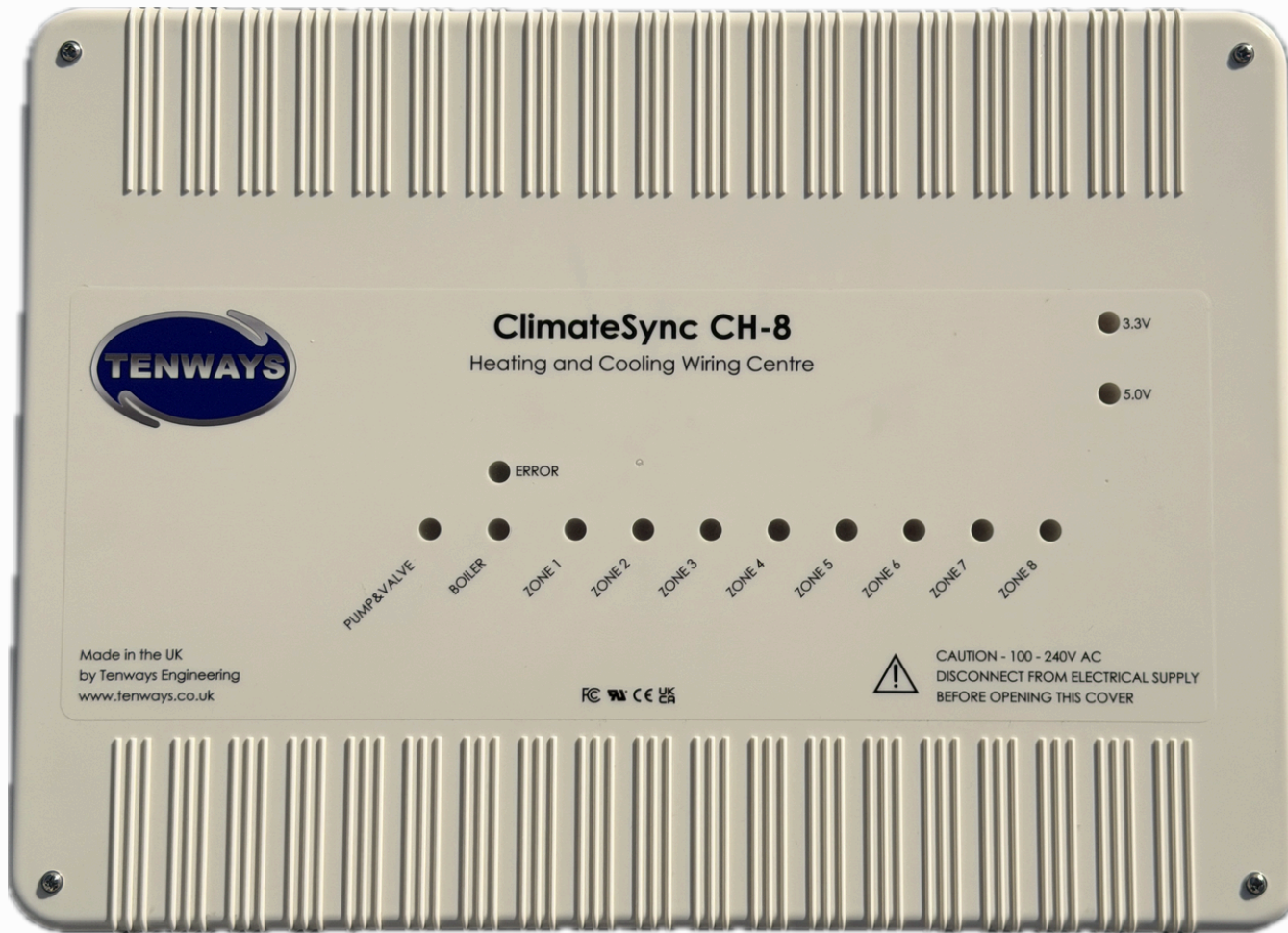




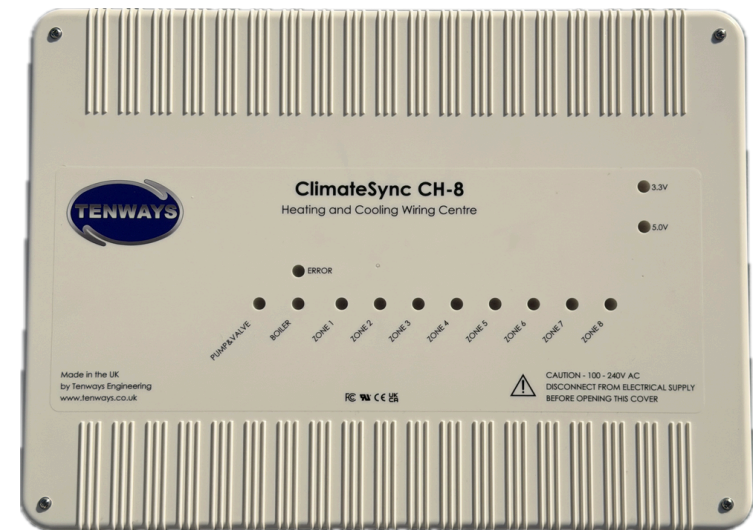
ClimateSync Setting Manual





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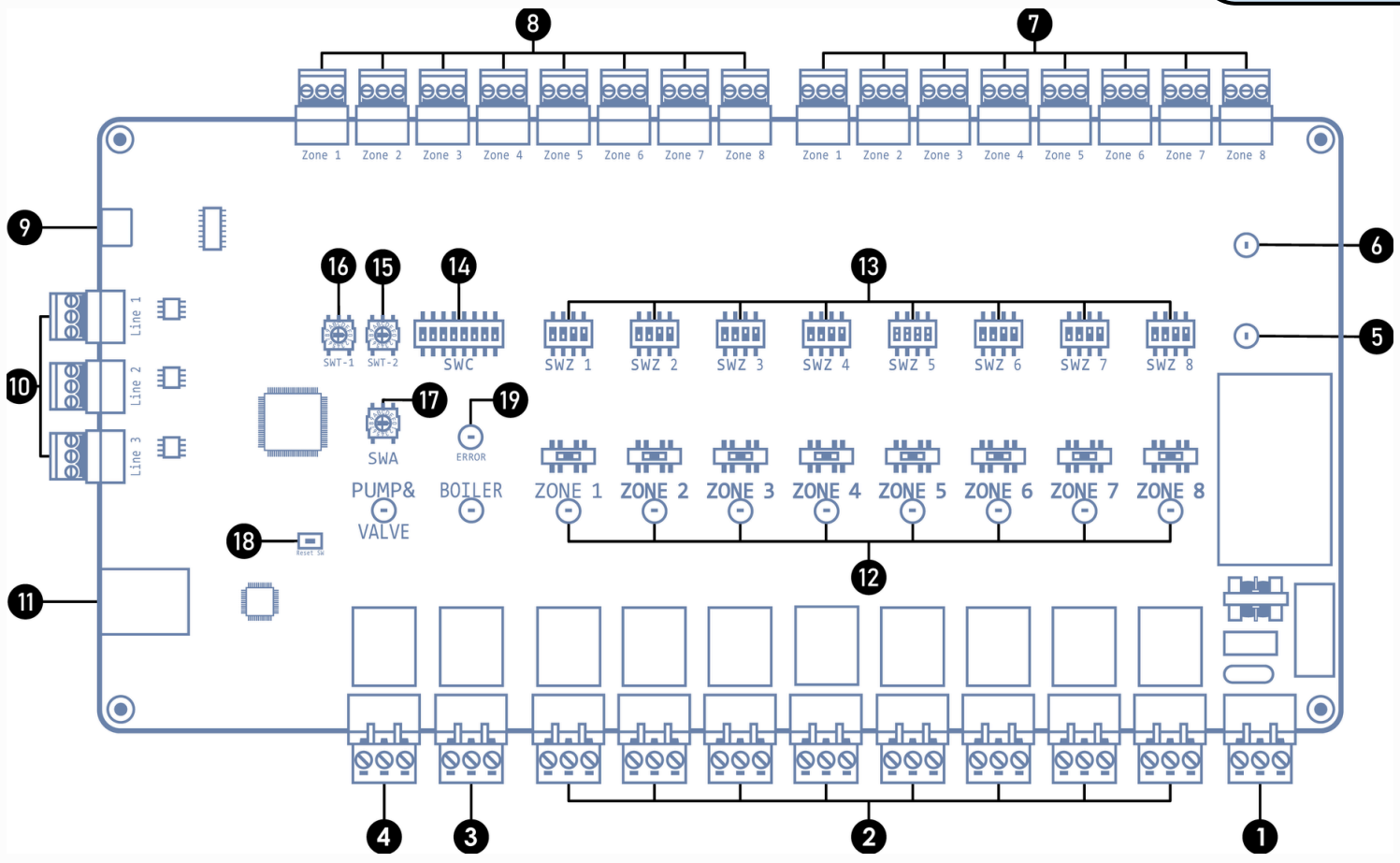
1. Cover Page
2. Index
3. Technical Data Sheet
4. ClimateSync Layout
5. DIP Switch Setting
6. Rotary Switch Setting
7. Modbus Lines setup
8. Operation State after Power Reset + Zone Lock
9. Zone Application type
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Note: in this Manual, the letter x in Zone Parameter ID, represents the zone number. i.e Zone parameter x18 for zone 5, will be 518

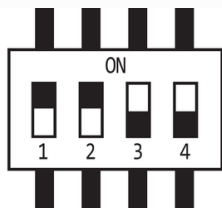


Power Supply:	110-240V AC 50-60Hz
Power input maximum load:	200ma
Power input fuse rating:	500ma
Relay Rating:	5 Amp
USB Voltage:	5 VDC
PCB dimensions:	305mm x 150mm
Enclosure dimensions:	400mm (W) x 290mm (H) x 50mm (D)
Enclosure Material:	POLYLAC® ABS PA-765A
Flammability Rating:	UL94 Standard V-0 Value
Weight:	1500g
Temperature Sensor Type:	NTC
Temperature Sensor Rating range:	5-100kΩ
Temperature Sensor default Rating:	10kΩ @ 25°C
Certification:	CE, UKCA, FCC, ROHS
Operating conditions:	Ambient temperature -10°C ~ 60°C / 14°F ~ 140°F Humidity 0% ~ 96% non-condensing
Storage conditions:	Ambient temperature -20°C ~ 60°C / -4°F ~ 158°F Humidity 0 % ~ 98 % non-condensing
Communication Lines:	MODBUS RTU L1: RS-485 communication line (A / B) MODBUS RTU L2: RS-485 communication line (A / B) MODBUS RTU L3: RS-485 communication line (A / B) Ethernet: 100Mbps USB Host 12Mbps



- | | |
|---|---|
| <ul style="list-style-type: none"> 1. Main Power Input 110-240V AC 50-60Hz 2. Heating Control Zone 1- 8 (NO-COM-NC Volt Free Relays) 3. Boiler Demand Signal (NO-COM-NC Volt Free Relay) 4. Manifold Pump / Valve Signal (NO-COM-NC Volt Free Relay) 5. Power LED (5V) 6. Power LED (3.3V) 7. Room Temperature Sensors Zone 1- 8 8. Floor Temperature Sensors Zone 1- 8 9. USB-C Connection 10. Modbus Port Line 1- 3 | <ul style="list-style-type: none"> 11. Ethernet Port 12. Zone Demand LED's Zone 1- 8 13. Zone Setup DIP Switches (SWZ 1- 8) 14. Common Setup DIP Switch (SWC) 15. Rotary Switch for Floor Temperature Limits (SWT-2) 16. Rotary Switch (SPARE) 17. Rotary Switch for ClimateSync ID Setup (SWA) 18. Reset Button 19. Error LED (illuminates if any temperature sensor is faulty) |
|---|---|

Zone DIP Switches



SWZ 1 - 8

SWZ*-1: OFF = Zone Not in Use
ON = Zone in Use

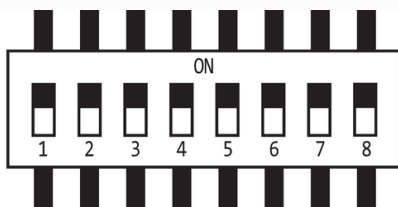
SWZ*-2: OFF = Floor temperature Limit not required
ON = Floor temperature Limit Required

SWZ*-3: Zone Application type:
OFF = **WET UFH** (Heat Demand will trigger Boiler & Pump)
ON = **OTHER**, by following Zone Parameter ID x18 (118, 218....818):
1: **ELECTRIC Floor Heating** (1) (Heat Demand will not trigger Boiler & Pump).
2: **RADIATOR** (2) (Heat Demand will trigger Boiler)
3: **ON/OFF** only (3) (no temperature control, locked in fan mode)

NOTE: the default application type for SWZ*-3 ON is ELECTRIC floor heating (type 1)

SWZ*4-: SPARE

Common DIP Switches



SWZ 1 - 8

SWC-1: OFF = Auto Mode: AC Cool/ AC Heat
ON = Auto Mode: AC Cool / Floor Heating

SWC-2: SPARE

SWC-3: OFF = HEAT MODE triggers AC Heat (HAUX triggers Floor Heat)
ON = HEAT MODE triggers Floor Heat (HAUX triggers AC Heat)

SWC-4: SPARE

SWC-5: SPARE

SWC-6: OFF = Filter Sign indicates: Clean AC filter (and reset counter)
ON = Filter Sign indicates: Floor Temperature Limit Reached

SWC-7: SPARE

SWC-8: OFF = USB communication Disabled
ON = USB communication Enabled (Default)



SWT-2
Rotary Switch

SWT-2:

Floor temperature limit setting. Range: 27°C (Position 0) ~ 42°C (Position F)

Note: Higher and lower limits, as well as individual zone limits are possible via Parameter Settings.

Switch Position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Temp Limit (°C)	27°C	28°C	29°C	30°C	31°C	32°C	33°C	34°C	35°C	36°C	37°C	38°C	39°C	40°C	41°C	42°C

SWTA:

ClimateSync Address: up to 16 ClimateSync's can be daisy chained as one network (addresses 0~F)

Note: the zone addresses for each ClimateSync will follow SWA address as below.



SWA
Rotary Switch

SWA Switch Position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Zone Addresses	001 : 008	011 : 018	021 : 028	031 : 038	041 : 048	051 : 058	061 : 068	071 : 078	081 : 088	091 : 098	101 : 108	111 : 118	121 : 128	131 : 138	141 : 148	151 : 158

SWT-1 Spare

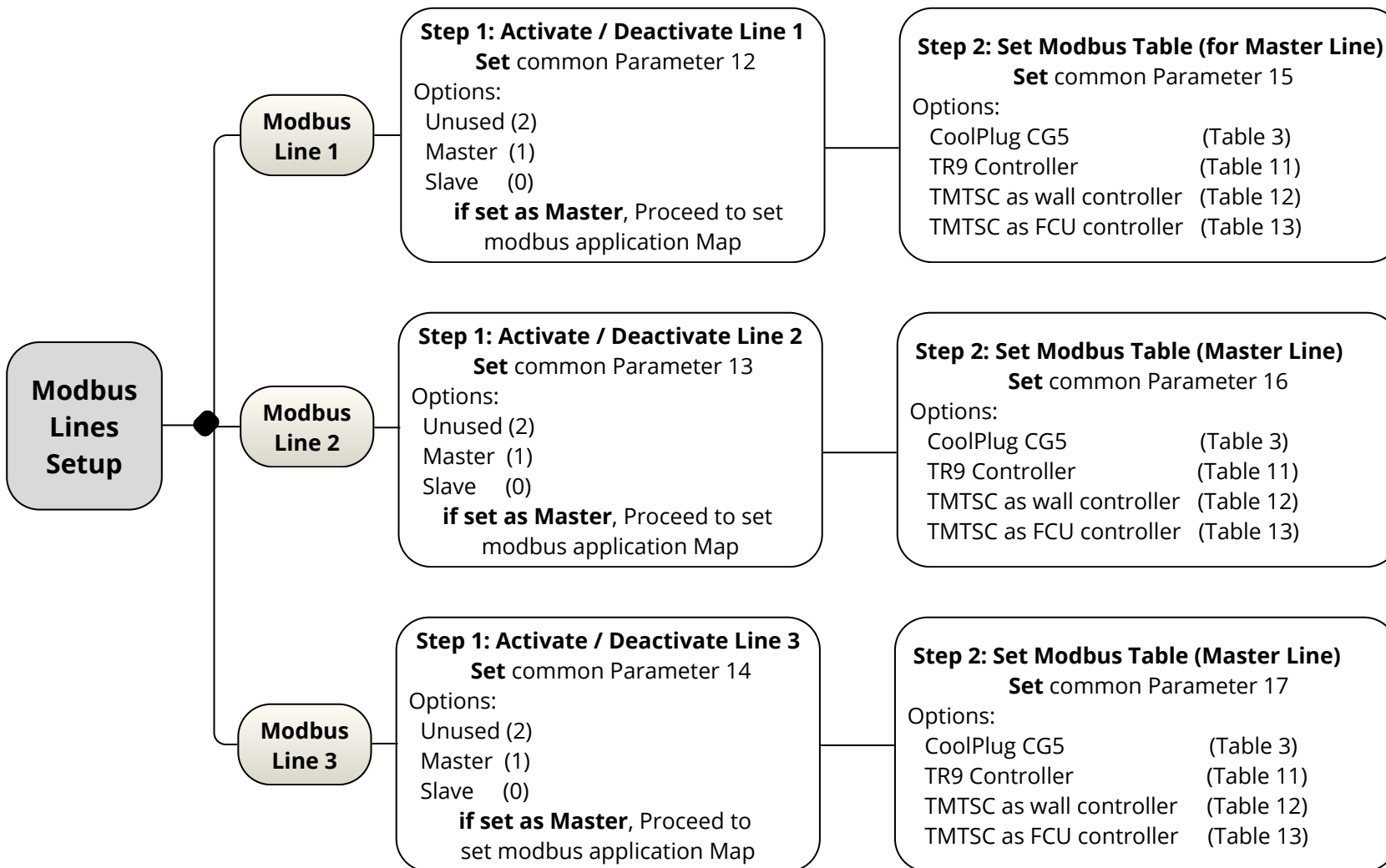
Function:

Activate and configure Modbus lines L1, L2 L3

here you activate / deactivate modbus lines and set the modbus table application.

Note:

only one line can be set as a Slave.



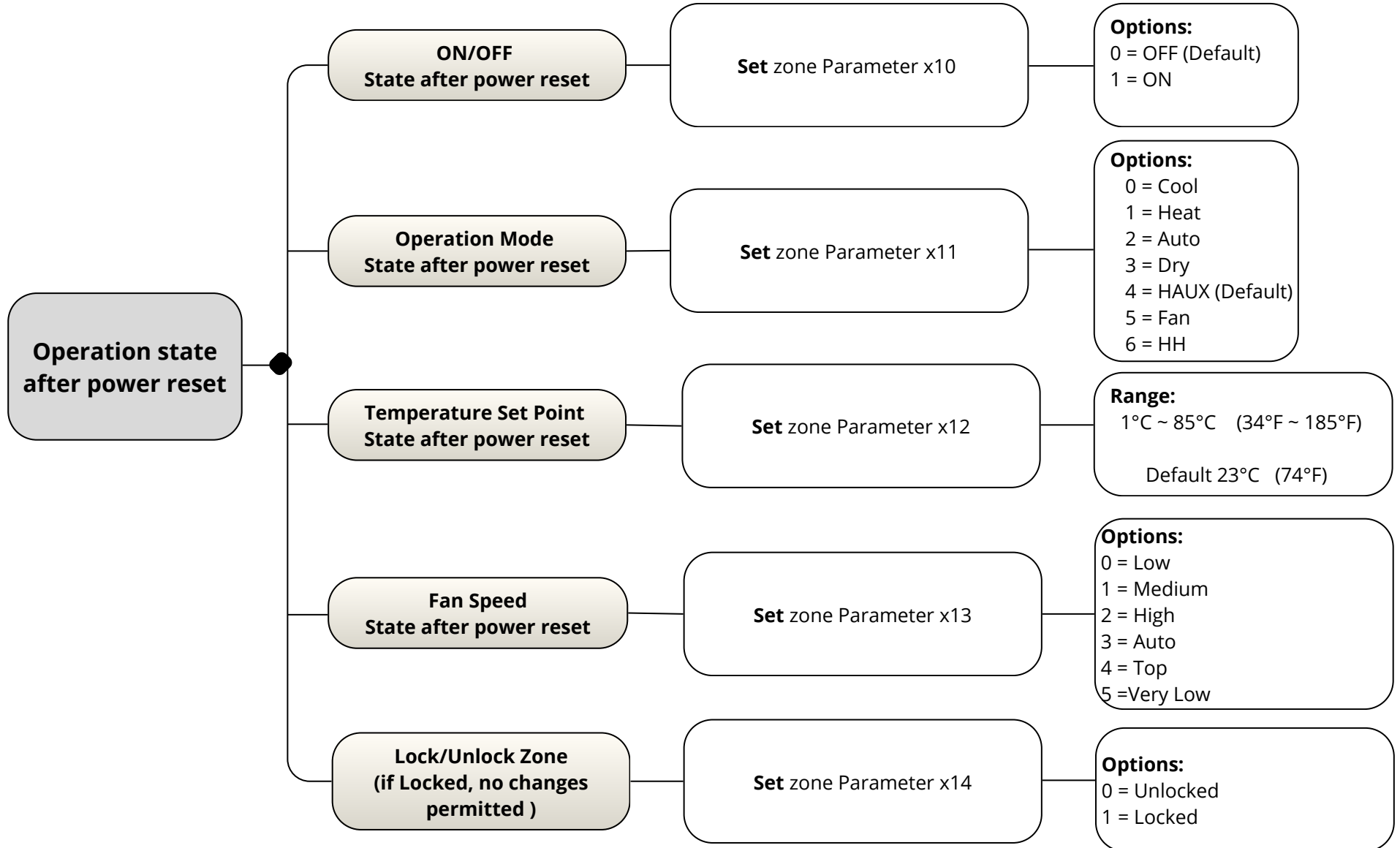
Note: no need need to set Modbus table for slave line

Operation State after Power Reset & Zone Lock

Function:

Operation state after power reset

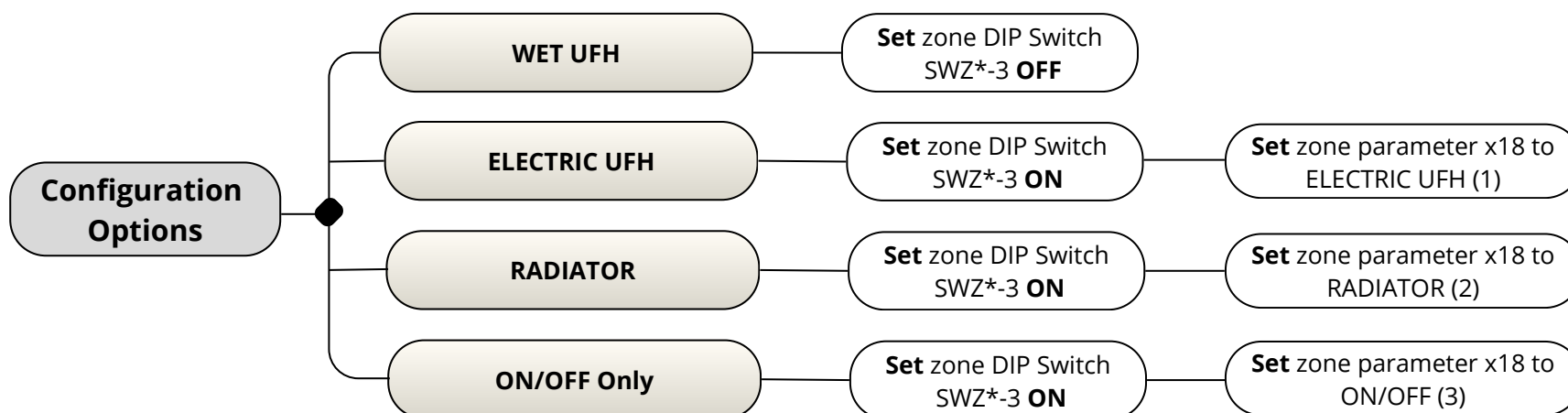
here you set for each zone, the zone operation state after power reset



Function:

Defines the zone heating application type. Options:

1. **WET UFH** (Radiant Heat) - zone demand will also trigger the Boiler & Pump Relays.
2. **ELECTRIC UFH** (Radiant Heat) - zone demand will NOT trigger the Boiler & Pump Relays.
3. **RADIATOR** - zone demand will also trigger the Boiler Relay.
4. **ON/OFF only** - zone locked in FAN mode (no temperature control).



NOTE: Default application type for SWZ*-3 **ON** is ELECTRIC UFH (1)

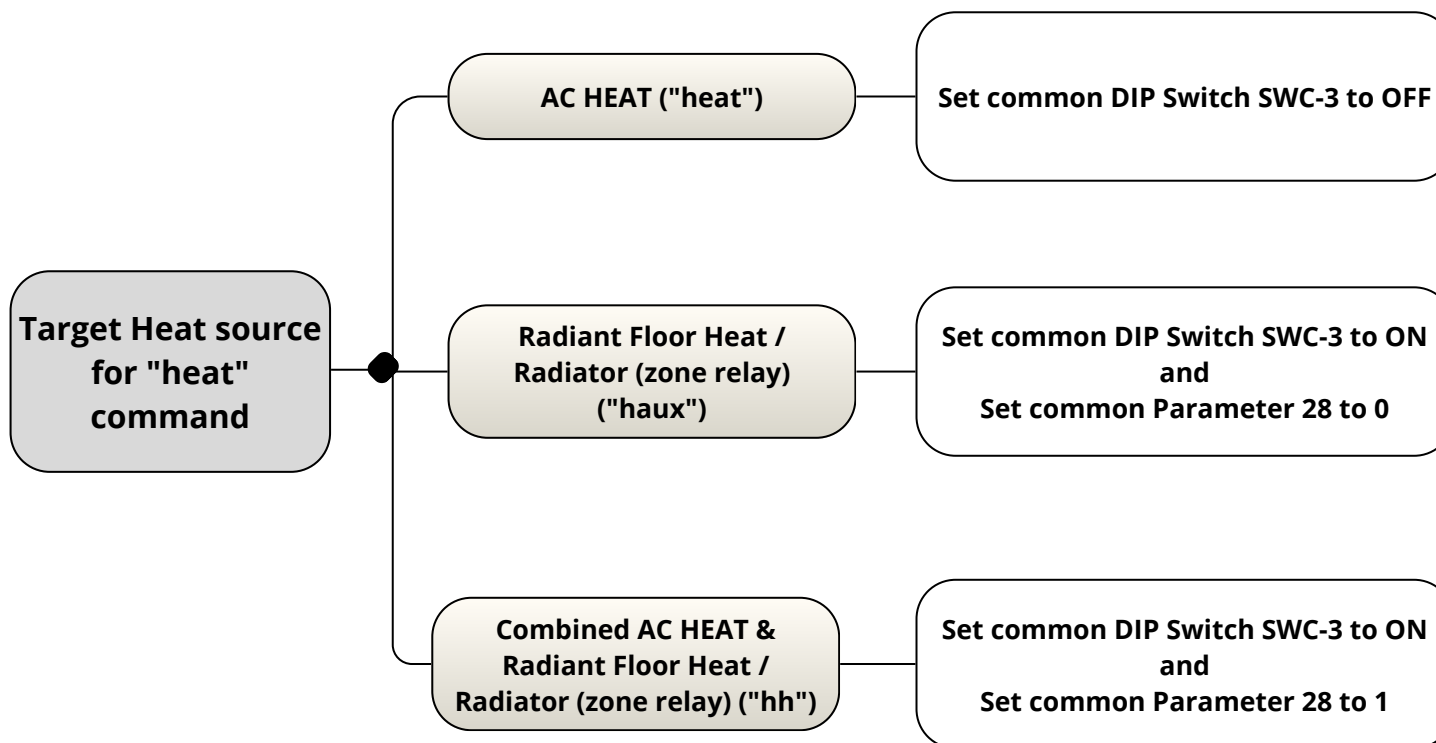
Function:

Automation "heat" command will trigger which mode?

ClimateSync supports three heat modes:

AC Heat ("heat" mode), Floor Radiant Heat ("haux" mode), Combined Floor Radiant Heat & AC Heat ("hh" mode).

By default, when "heat" command is received from an Automation system via the CoolMaster/ CoolLinkBridge, the ClimateSync will trigger AC HEAT mode. some Automation system drivers only have one heat option ("heat" command). Here you can set which of the three options above will be used for "heat" mode.



NOTE: Default for Parameter 28 is 0

Function:

On/Off Hysteresis (for heat demand).

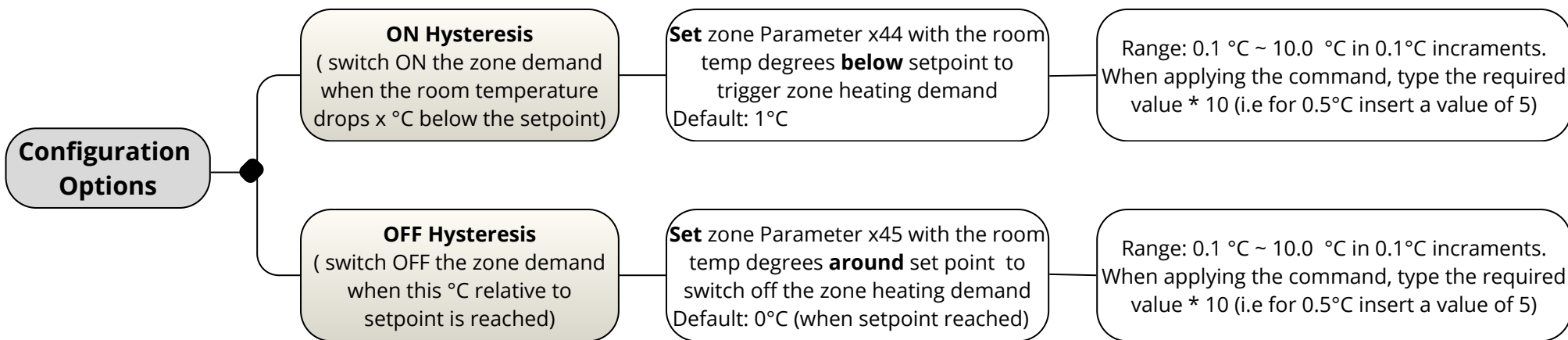
The hysteresis defines how much the room temperature can vary around the set point before the heating relay switches on or off.

This prevents frequent relay switching and ensures stable temperature control.

Example:

a set point of 23 °C, an ON hysteresis of 0.5 °C, and an OFF hysteresis of 0.5 °C:

- The relay switches ON when the temperature drops to 22.5 °C
- The relay switches OFF when the temperature rises to 23.5 °C



Note: OFF Hysteresis can be set to above or below the setpoint. to set below set point, use the table below

Required OFF Hysteresis °C below set point	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1	-1.1	-1.2	-1.3	-1.4	-1.5	-1.6	-1.7	-1.8	-1.9	-2
Parameter X45 Value	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240	239	238	237	236

Note: negative OFF Hysteresis available from Firmware 0.1.80.8

ClimateSync offers two options for AUTO Operation Mode:

1. **AC AUTO:** the AC will Cool or Heat based on set point (deadband by AC Logic).
2. **ClimateSync AUTO:** ClimateSync to automatically switch between floor radiant heat (or Radiator) and air conditioning, based on the set point and room temperature.

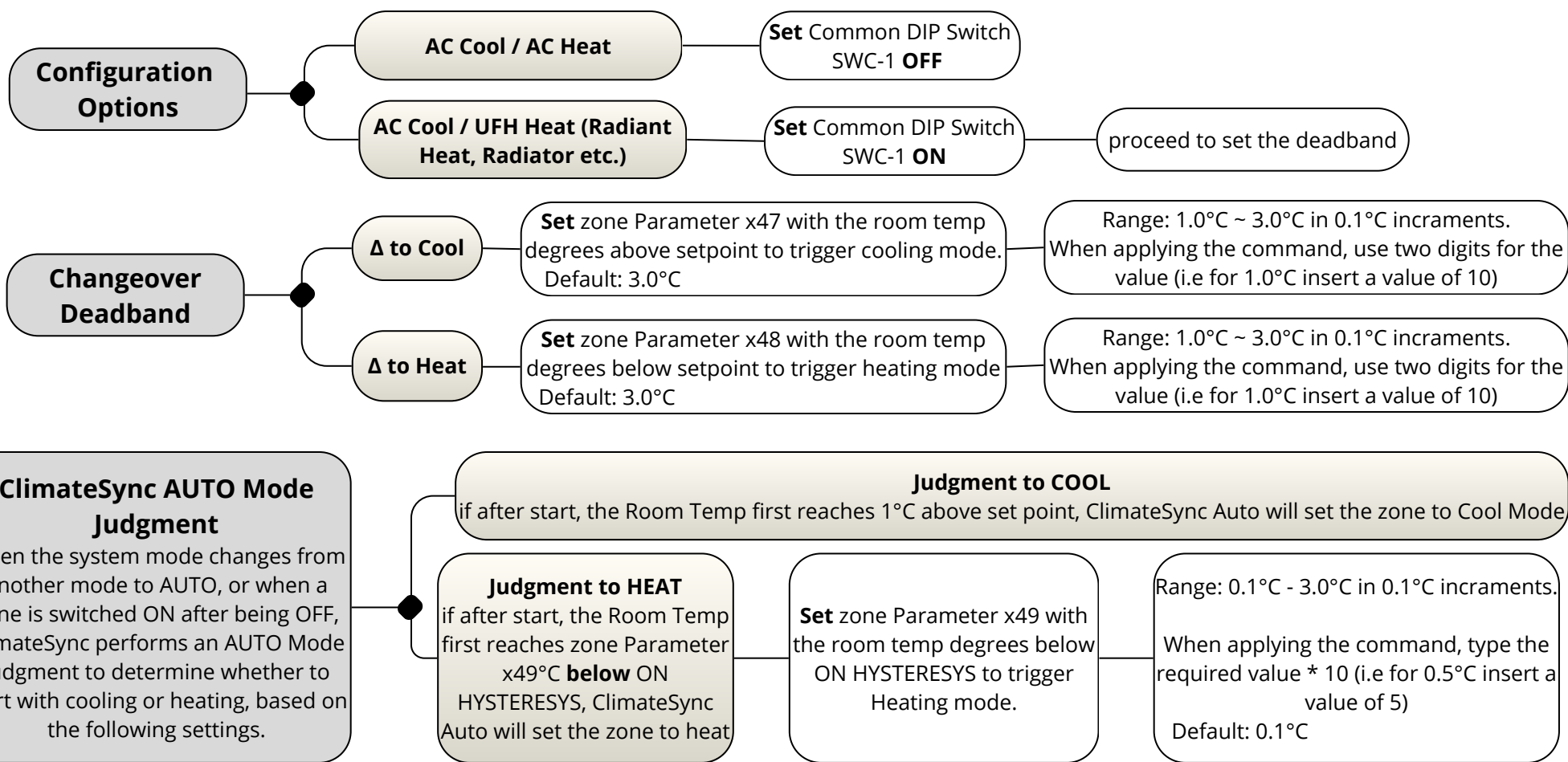
You can define a ΔT (delta T) value — the temperature difference from the set point that triggers the mode switch.

Example: a set point of 23 °C and ΔT set to 3 °C, the system will:

- Start cooling if the room reaches 26 °C
- Start heating if the room drops to 20 °C

Between these points, the system maintains comfort using normal relay on/off control around the set point (ON/OFF Hysteresis).

NOTE: to use ClimateSync AUTO, you must first enable this by setting DIP Switch SWC-1 to ON



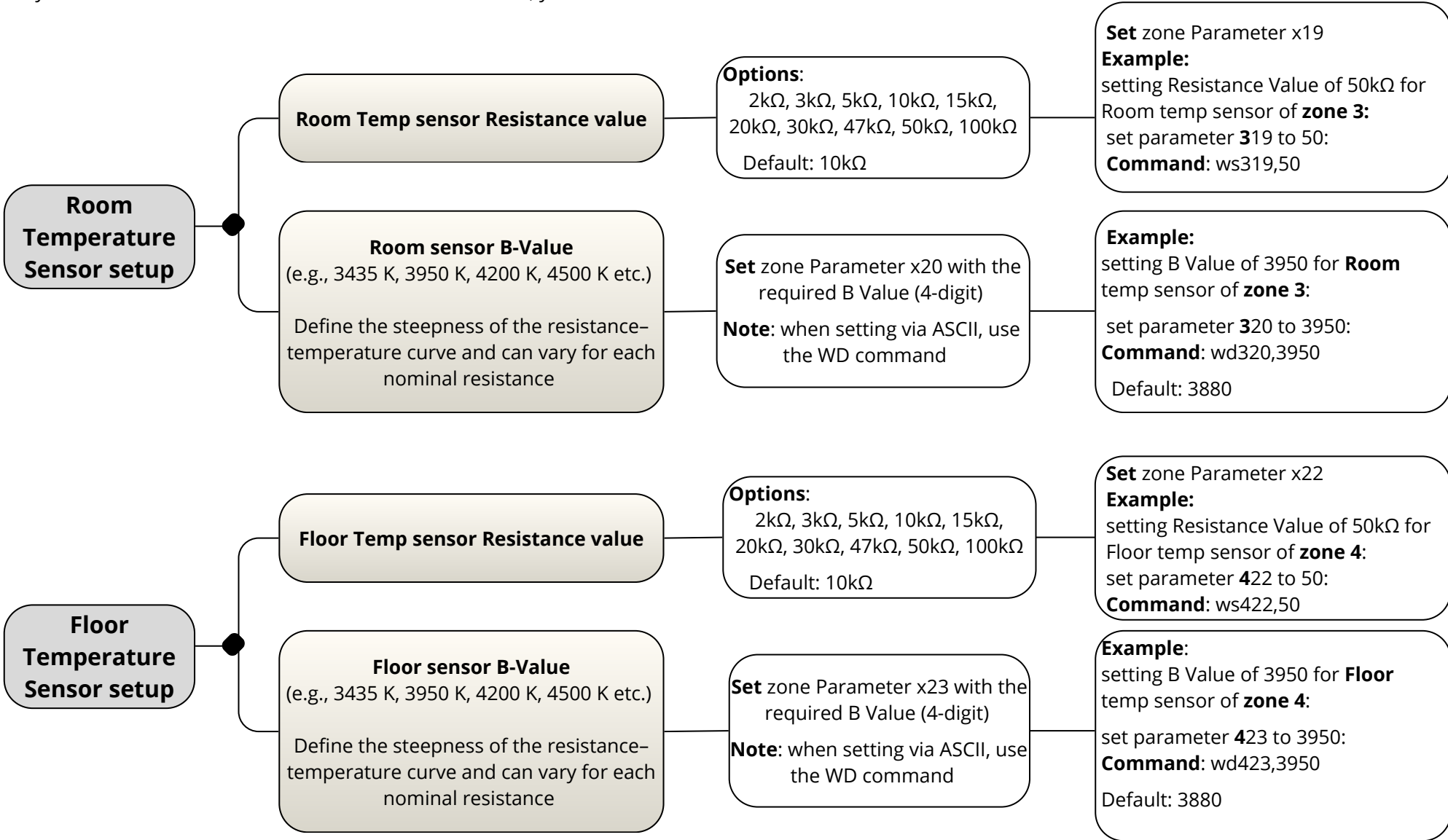
Note: Before Judgment temperature is reached, no heating or cooling will be produced

Function:

Room & Floor Temperature Sensor setup

The ClimateSync supports NTC type temperature sensors.

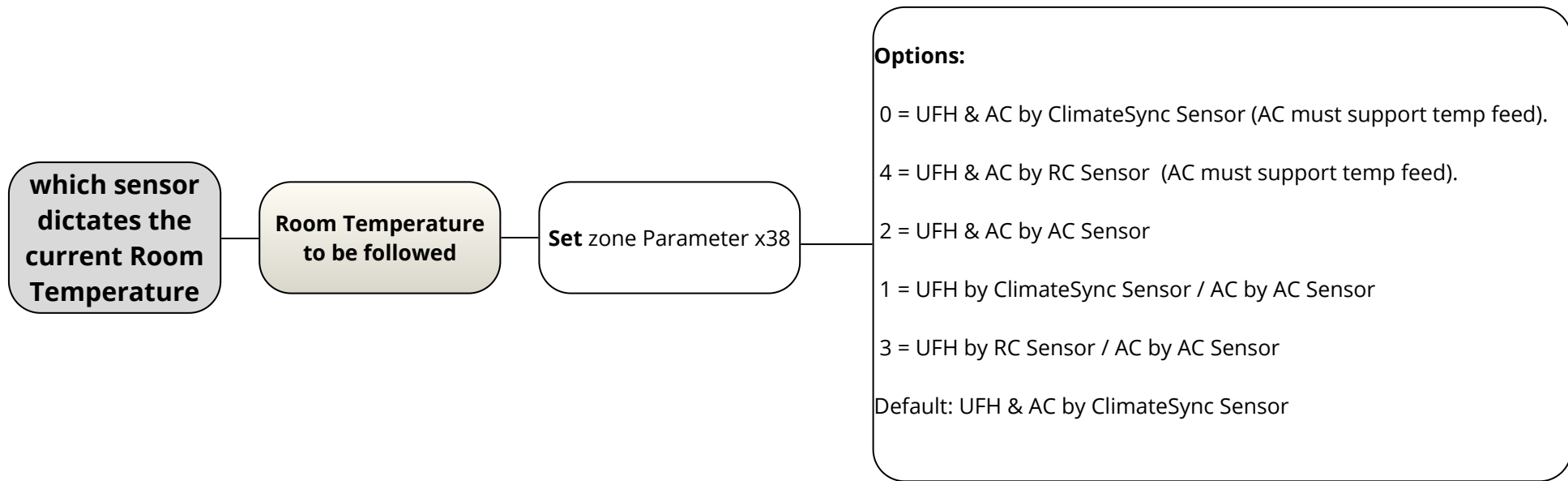
By default the sensor resistance value is 10kΩ. However, you can set individual Resistance and B-value for each sensor.



Function:

Temperature Source (Room Temperature)

By default, The ClimateSync follows a room temperature sensor connected to the ClimateSync's zone temperature sensor terminal.
Here you can set other temperature sensing options



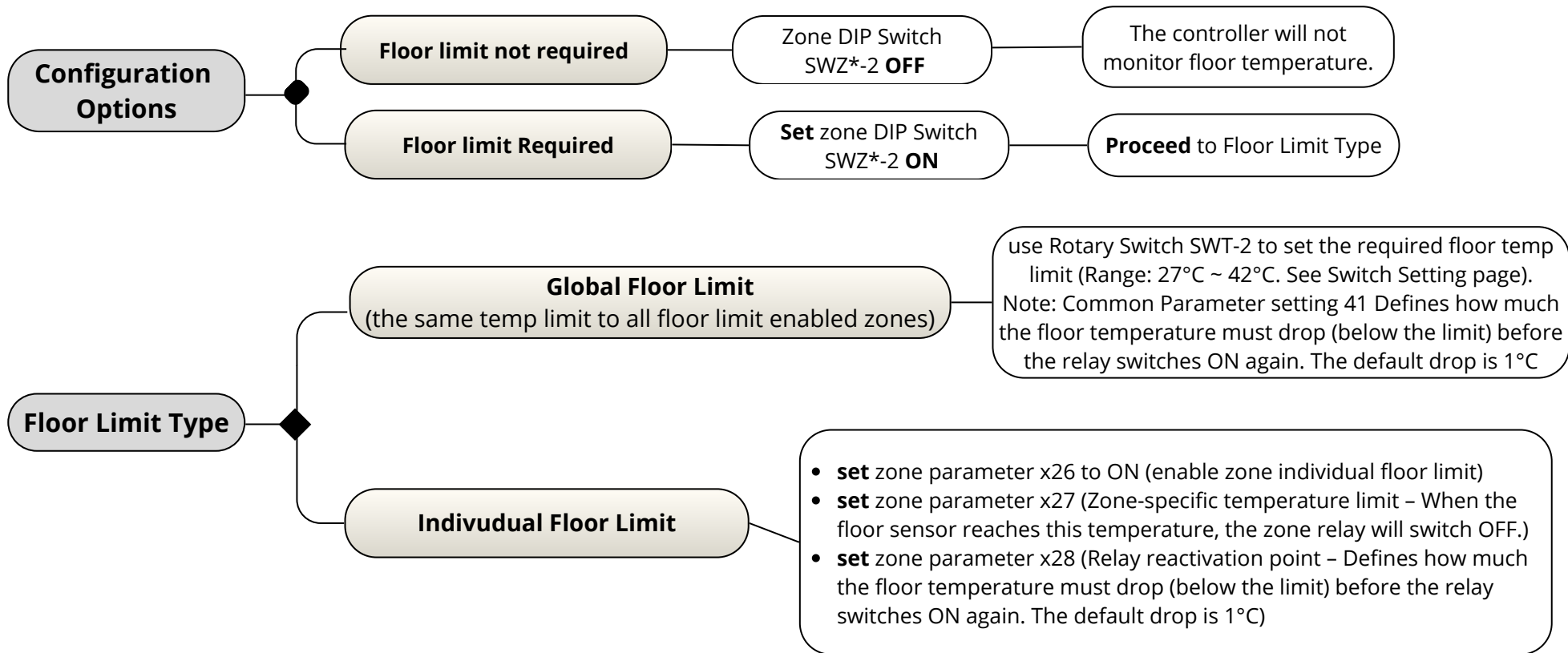
Function:
Defines whether the ClimateSync should apply a floor temperature protection limit to prevent overheating of the floor surface. This feature ensures that the floor temperature remains within safe and comfortable limits when underfloor heating is in operation.

By default, all zones with Floor Temp Limit Enabled (SWZx-2 ON) follow a common floor temperature limit, which is set using the rotary switch SWT-2.

If you prefer to set an individual floor temperature limit for a specific zone, you can disable the zone's participation in the global limit and enable its individual floor limit control. to do so, set zone Parameter ID x26 to ON (1).

Once individual control is enabled, the next two settings allow you to configure:

1. Zone-specific temperature limit (Zone Parameter ID x27) – When the floor sensor reaches this temperature, the zone relay will switch OFF.
2. Relay reactivation point (Zone Parameter ID x28) – Defines how much the floor temperature must drop (below the limit) before the relay switches ON again. The default drop is 1°C



ClimateSync Error Code List:

0001: Faulty ClimateSync Room Temperature Sensor: no resistance or value out of range.

0002: Faulty ClimateSync Floor Temperature Sensor: no resistance or value out of range.

0003: Air Conditioning (AC) communication error: the ClimateSync is unable to communicate with the AC unit.

0004: Remote Controller (RC) communication error: the ClimateSync is unable to communicate with the Modbus wired controller (RC).

ClimateSync ERROR LED:

Indicates a temperature sensor is faulty. Please reset the ClimateSync once fixed the sensor.

Daikin Fault Code conversion:

Operation Modes:

AC Cool
AC Heat
AC Dry
Radiant Heat (UFH)
Combined AC Heat & Radiant Heat
Auto (AC Cool / Radiant Heat)
FAN
OFF

Fan Speeds:

Low
Medium
High
Auto
Top (for AC units that support)
Very Low (for AC units that support)

Temperature Set Point:

Available Range: 1°C ~ 85°C / 34°F ~ 185°F
Default Range: 5°C ~ 35°C / 41°F ~ 95°F

To change Set Point range:

Zone Parameter x35: Minimum set point °C (Default 5°C)
Zone Parameter x36: Maximum set point °C (Default 35°C)

Swing:

Options: Vertical, 30 Degrees, 45 Degrees, 60 Degrees, Horizontal, Auto, Off

⚙️ **ClimateSync Communication Interface**

Section: ASCII Communication via USB-C

The ClimateSync controller includes a built-in USB-C port that allows direct connection to a computer for configuration, diagnostics, and engineering-level access.

Communication is performed using an ASCII command protocol over a virtual serial (telnet-style) interface, providing full system visibility and control.

To begin, connect a USB-C cable between the ClimateSync and a computer.

The device will appear as a virtual COM port on the host operating system.

Next, open a terminal application such as PuTTY, or use TenwaysCom, a communication tool designed specifically by TENWAYS.

Select the correct COM port and connect using the standard serial parameters: • 9600 bps • 8 data bits • No parity • 1 stop bit

Once the serial connection is opened, the ClimateSync will automatically reboot, displaying the main ClimateSync setup information on the terminal.

After the startup sequence finishes, the controller will present the command prompt, indicating that it is ready to receive ASCII commands.

Commands are sent as plain-text ASCII strings and must be terminated with a carriage return <CR>.

Commands are not case-sensitive, but they must follow the exact syntax specified in the command list.

For every valid command, the ClimateSync returns a response such as confirmation, data output, or a formatted status value.

Invalid commands or parameters result in an error message.

Both read operations (retrieving status, temperatures, modes, sensor values, zone states, and parameter settings) and write operations (changing parameters, sending control instructions, updating limits) are supported.

Only one active communication session is allowed at a time; multiple programs cannot access the port simultaneously.

Always close the serial/telnet session before disconnecting the USB-C cable to prevent incomplete transactions.



ClimateSync HELP command, will display the available commands:

- HELP** - Print help info
- INFO** - MAC and Firmware version and every other setting of the ClimateSync
- SWPOS** - Position of all Switches
- LINE** - Actual Line Types
- APPTYPE** - Actual Application Types
- B** - Reboot ClimateSync

Parameter setting Commands:

- L** - List all setting Parameters
- DEFAULT** - Set all Parameters to default
- DE** - DE<zone> - Set a specific <zone> Parameters to default (<zone> = 1...8)
- DE9** - Set common Parameters to default
- RS** - RS<address> - Read single Parameter
- RD** - RD<address> - Read double Parameter
- WS** - WS<address>,<value> - Write <value> to a single Parameter<address> (One string no spaces)
- WD** - WD<address>,<value> - Write <value> to a double Parameter<address> (One string no spaces)

Control commands:

- LS** - List Zones status
- ATEMP** - Actual Temperature values
- UTEMP** - Used Temperature values
- LTEMP** - Temperature Limit Settings ON_HS; OFF_HS; dT_to_Cool; dT_to_Heat
- ON** - ON = Switch all Zones ON or ON<zone> = Switch a specific Zone ON
- OFF** - OFF = Switch all Zones OFF or OFF<zone> = Switch a specific Zone OFF
- ST** - ST<zone>,<value> = Set Temp of a specific Zone (if zone=0 then ALL zones)
- FS** - FS<zone>,<value> = Set FanSpeed of a specific Zone (if zone=0 then ALL zones)
- SWING** - SWING<zone>,<value> = Set Swing of a specific Zone (if zone=0 then ALL zones)
- MODE** - MODE<zone>,<value> = Switch a specific Zone to <value> mode (COOL=0,HEAT=1,...) - (if zone=0 then ALL zones)
- COOL** - COOL<zone> = Switch a specific Zone to COOL - (COOL = Switch all Zones COOL)
- HEAT** - HEAT<zone> = Switch a specific Zone to HEAT - (HEAT = Switch all Zones HEAT)
- AUTO** - AUTO<zone> = Switch a specific Zone to AUTO - (AUTO = Switch all Zones AUTO)
- DRY** - DRY<zone> = Switch a specific Zone to DRY - (DRY = Switch all Zones DRY)
- HAUX** - HAUX<zone> = Switch a specific Zone to HAUX - (HAUX = Switch all Zones HAUX)
- FAN** - FAN<zone> = Switch a specific Zone to FAN - (FAN = Switch all Zones FAN)
- HH** - HH<zone> = Switch a specific Zone to HH - (HH = Switch all Zones HH)
- LOCKZ** - LOCKZ<zone>,<value> = Lock a specific Zone - PowerStatus, Mode, SetPoint, FanSpeed
- UNLOCKZ** - UNLOCKZ<zone>,<value> = UnLock a specific Zone



```

>
ClimateSync 1.3
Fw.: 0.1.80.10 (T)
MAC: F0:2A:2B:8A:00:0F

SWA: 0
SWT-1: 0
SWT-2: 0 (27)
SWC: 1 0 0 0 1 0 0 1
SWZ-1: 1 1 0 0
SWZ-2: 1 1 0 0
SWZ-3: 1 1 1 0
SWZ-4: 1 1 0 0
SWZ-5: 1 1 1 0
SWZ-6: 1 1 0 0
SWZ-7: 1 1 1 0
SWZ-8: 1 1 0 0
3-pos: 00000000

Floor Temp Sensor Filter is ON
ROOM Temp Sensor Filter is ON
Application Type: 0 0 1 0 3 0 2 0

AUTO Mode: AC/HAUX

ASCII control: Enabled
Degree in Celsius
ClimateSync in SYNC mode
System: Heat Pump
Heat Mode: AC Heat
Filter Sign: Dirty Filter

Line 1 : Modbus Master (Type:13)
Line 2 : Modbus Master (Type:12)
Line 3 : Modbus Slave (ID:1)

SetPoint:      Zone1: 23.0C Zone2: 23.0C Zone3: 23.0C Zone4: 23.0C Zone5: 23.0C Zone6: 23.0C Zone7: 23.0C Zone8: 23.0C
Temp ON_HS:    Zone1: 22.0C Zone2: 22.0C Zone3: 22.0C Zone4: 22.0C Zone5: 22.0C Zone6: 22.0C Zone7: 22.0C Zone8: 22.0C
Temp OFF_HS:   Zone1: 23.0C Zone2: 23.0C Zone3: 23.0C Zone4: 23.0C Zone5: 23.0C Zone6: 23.0C Zone7: 23.0C Zone8: 23.0C
Temp dT_to_COOL: Zone1: 26.0C Zone2: 26.0C Zone3: 26.0C Zone4: 26.0C Zone5: 26.0C Zone6: 26.0C Zone7: 26.0C Zone8: 26.0C
Temp dT_to_HEAT: Zone1: 20.0C Zone2: 20.0C Zone3: 20.0C Zone4: 20.0C Zone5: 20.0C Zone6: 20.0C Zone7: 20.0C Zone8: 20.0C

Checking Modbus Slave devices...
Scanning Slave-Type: 13 on Line1...
1:+ 2:+ 3:+ 4:+ 5:- 6:- 7:- 8:-
Scanning Slave-Type: 12 on Line2...
1:+ 2:+ 3:+ 4:+ 5:- 6:- 7:- 8:-
Line 3 is not a Master Line!

Floor Limit: F1:27.0 F2:27.0 F3:27.0 F4:27.0 F5:27.0 F6:27.0 F7:27.0 F8:27.0
Floor Temp:  F1:24.9 F2:25.1 F3:25.4 F4:25.4 F5:25.4 F6:24.9 F7:25.2 F8:25.0
Room Temp:   R1:21.3 R2:25.4 R3:24.8 R4:25.3 R6:24.9 R7:25.3 R8:25.4
RC Temp:     R1:21.3 R2:25.4 R3:24.8 R4:25.3
AC Temp:     A1:21.3 A2:25.4 A3:24.8 A4:25.3

Init Master Line 1 as MTSC-FCU...
Init Master Line 2 as MTSC-AC...

Synchronization...

DONE

```

← Firmware Version and Serial Number
 ← SWA: Climate Sync Address 0-F (16 addresses)
 ← SWT-1 SPARE
 ← SWT-2 Rotary switch for floor limit temperature (27°C - 42°C). see DIP switch setting page.
 ← SWC: 8 Global DIP Switches for common ClimateSync setup 0=OFF, 1=ON. see DIP switch setting page.
 ← SWZ1 - SWZ8: 4 Individual zone DIP Switches for Zone Setup 0=OFF, 1=ON. see DIP switch setting page.
 ← Zones 1-8 application type 0=wet UFH, 1=Electric UFH, 2=Radiator, 3=ON/OFF
 ← AUTO MODE AC/AC = AC Cool AC Heat, AC/UFH = AC Cool UFH Heat
 ← "heat" command will trigger AC Heat (other options: UFH, Combined UFH & AC Heat)
 ← Filter Sign indication type: Options: Dirty Filter, Floor temperature limit reached.
 ← Modbus lines setup
 ← Zone Default set point
 ← Zone ON Hysteresis in relation to set point
 ← Zone OFF Hysteresis in relation to set point
 ← Zone Auto Mode dT_to_COOL in relation to set point
 ← Zone Auto Mode dT_to_HEAT in relation to set point
 ← Slave devices discovered on L1(+ represents slave discovered)
 ← Slave devices discovered on L2 (+ represents slave discovered)
 ← Zone Floor temperature Limit
 ← Zone current floor temperature
 ← Zone current room temperature
 ← Zone Current Wired controller temperature
 ← Zone current AC room temperature

RS Command = Reading Parameter

WS Command = Writing Parameter

RD Command = Reading Special Parameter for temp sensor B value

WD Command = Writing Special Parameter for temp sensor B value

```
rs118  
118:1
```

Reading zone 1 application type: the value of parameter 118 (parameter 18 of zone 1)
Reply (**1**=UFH, **2**=Radiator, **3**= ON/OFF)

```
ws518,2  
518:2
```

This command writes the Zone 5 application type (**1** = Electric, **2** = Radiator, **3** = On/Off) into Parameter 518 (Parameter 18 of Zone 5).
confirmation Reply

```
ws13,1  
13:1  
ws16,12  
16:12
```

This command writes value 1 into Parameter 13 to set Line 2 as a Modbus Master (**0** = Slave, **1** = Master, **2** = Unused).
confirmation Reply.

This command writes value 12 into Parameter 16, setting Line 2 to use the Modbus slave map for the TMTSC wall-controller
confirmation Reply (**3** = CG5, **11**= TR9 Controller, **12** = TMTSC as wall controller, **13** = TMTSC as FCU controller)

```
rd620  
620:3880
```

Reading special parameter: parameter 20 of zone 6 (Zone 6 Room Temp sensor B Value)
Reply: the B Value is 3880

```
wd620,3950  
620:3950
```

Writing special parameter: setting parameter 20 of zone 6 to 3950
Reply: successfully set B Value to 3950

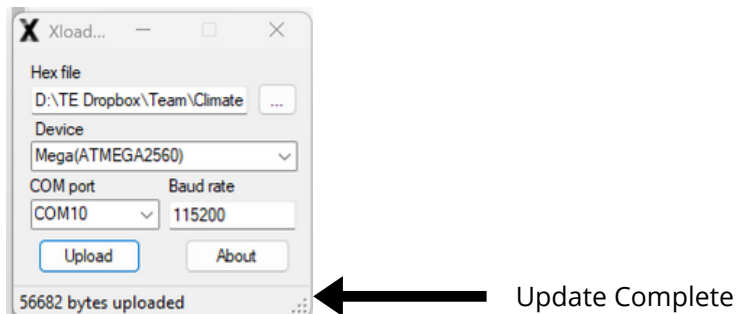
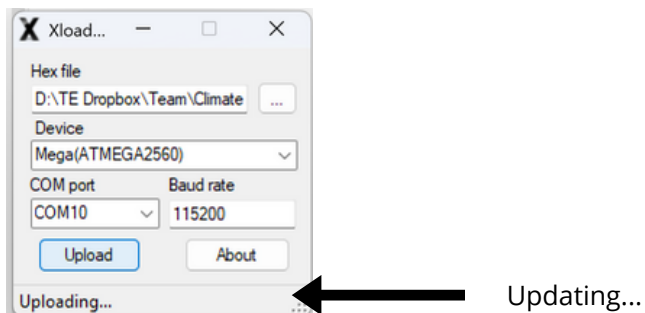
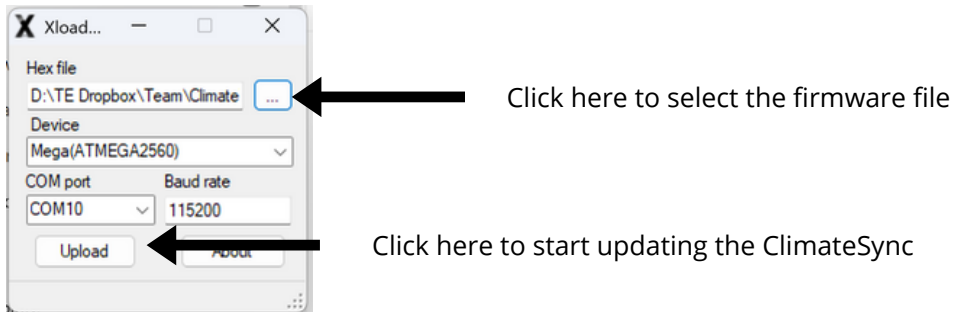
ClimateSync firmware update

Use the X Loader program to update the ClimateSync Firmware over USB

use the below settings:

Device: Mega (ATMEGA2560)

Baud Rate: 115200



Notes:

1. only Update the firmware if instructed to do so by a ClimateSync Engineer.
2. some updates may require reboot to default parameters and applying all site specific parameter settings.