NOVEMBER 23, 2021

CC200 PV - WEATHER COMPENSATION (CC200-SM-PV)
CC200 PV - ADVANCED (CC200-SM-PVA)

(REV 20.1.6+)

CRIOSU CONTROLS

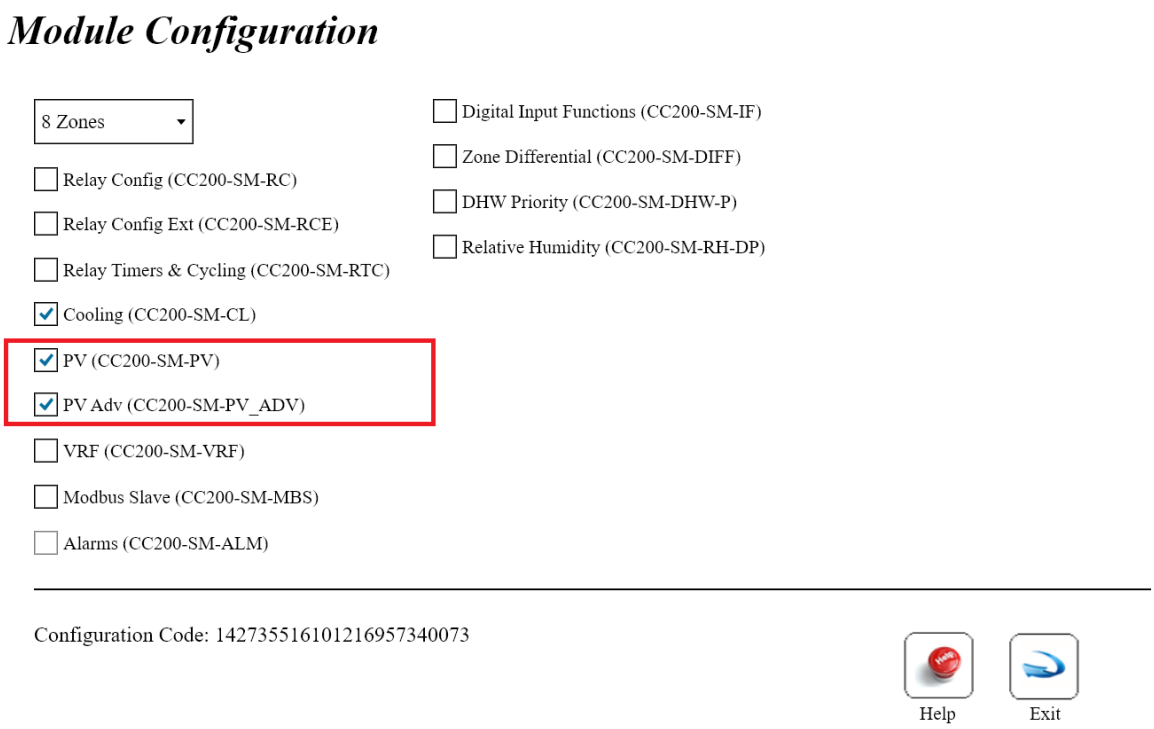
Table of Contents

Introduction

Configuration 0-10v Proportional Valve (PV).

The system supports a total of 16 PV channels. The cc771 IO module supports 1 PV channel. The PV8 module supports 8 PV channels.

Module Requirements



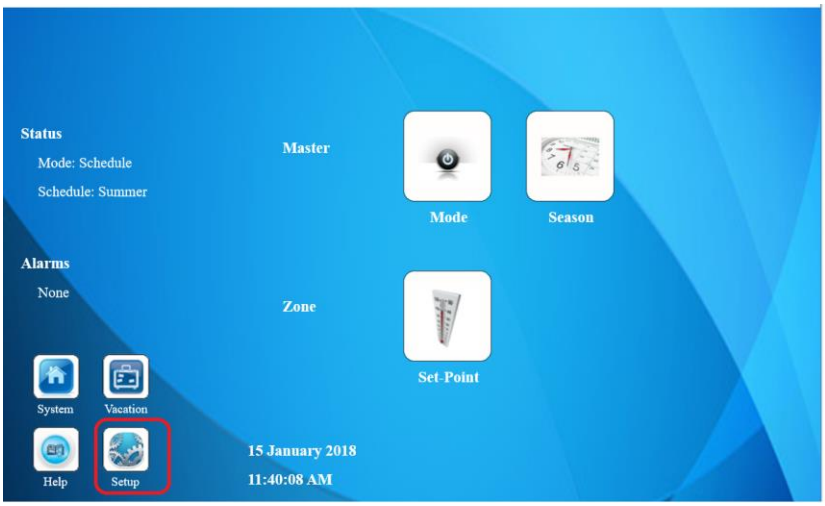
PV Advanced Features

The following feature are only accessible with the Advance PV Module

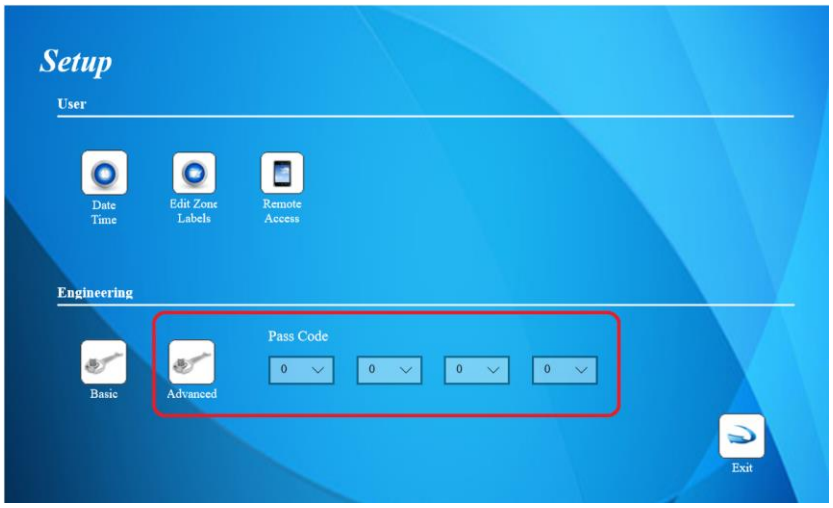
1. Flow Control
2. Reference Source Types:
    a. Zone
    b. IO/Port
    c. Hottest Zone
    d. Manual

Access PV Configuration

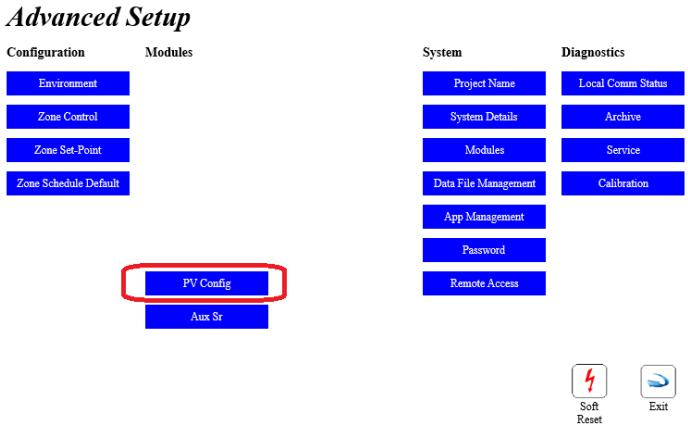
Step 1. Press "Setup" on the Home Screen



Step 2. Enter "Pass Code" and press "Advanced" on the Setup Screen



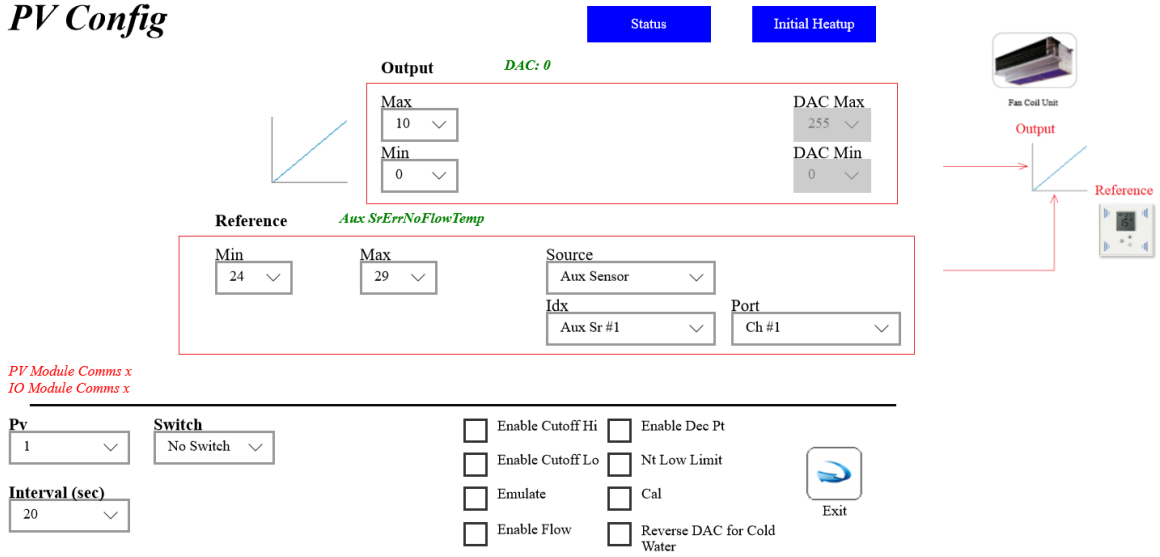
Step 3. Press "PV Config"



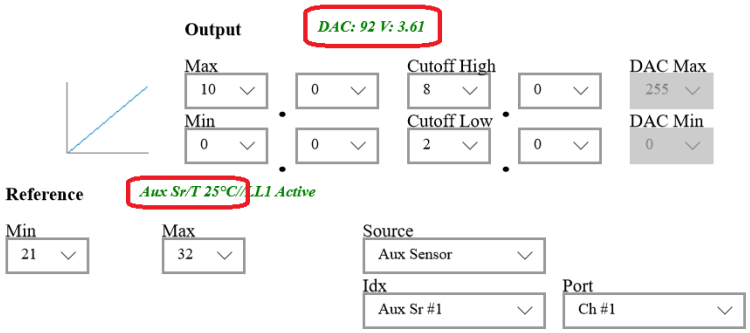
PV Configuration – Weather Compensation (CC200-SM-PV)

A Non-Feedback system uses a Reference Input to control a 0-10v Output.

Parameter settings are detailed in "Parameter Settings" Chapter.



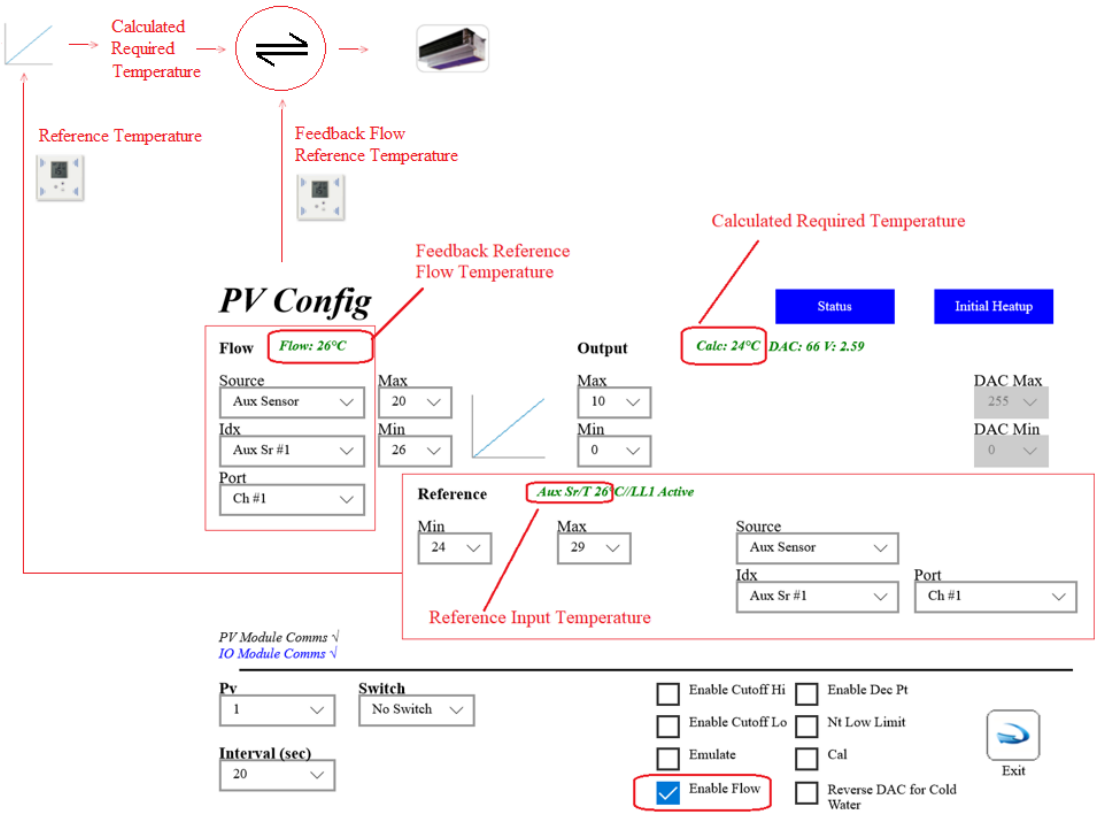
Example – Basic Non-Feedback



In this example an input T of 25°C (Aux Sensor #1 channel #1) will yield an output voltage of 3.6v (DAC 92)

PV Configuration - Advanced (CC200-SM-PV_ADV)

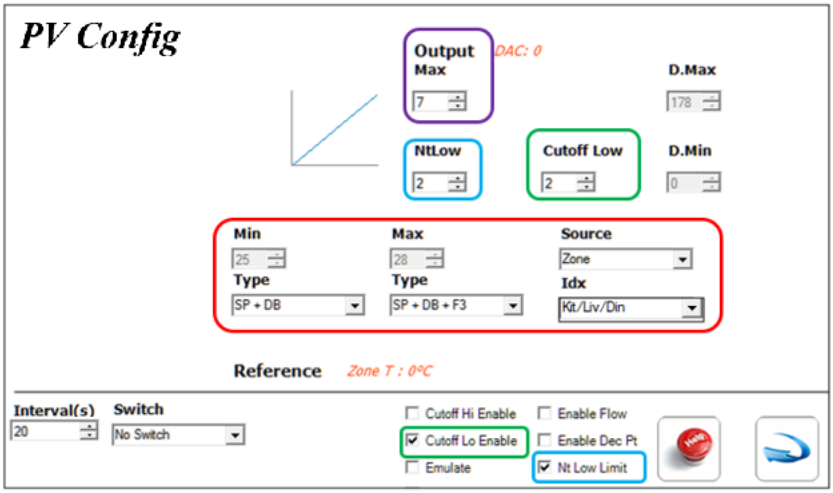
In the feedback system the 0-10v output is determined by comparing a calculated required output with a Flow Temperature.



The Output Voltage is reduced when the Flow Temperature is greater than the Calculated Temperature and increased when the Flow Temperature is less than the Calculated Temperature. The greater the difference the greater the change in the DAC.

Parameter settings are detailed in “Parameter Settings” Chapter.

Example - FCU with Max output of 7V



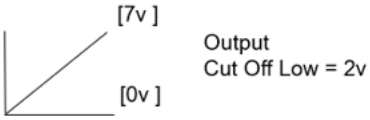
Step 2: Setup Cut Off Lo
Set Cut off to 2 (on All FCU)

Step 3: Setup Nt Lo Limit
Set NT Cut off to 2 (on All FCU)
User has the ability to enable or disable

Step 4: Setup Output Max
Set Output Max FCU)

Step 1: Setup source
Source Individual Zone
Idx: Select reference Zone e.g. Kitchen
Range Between
[SP+DB] & [SP+DB+F3]
Note DB (Deadband) set to 2
(Set in Eng / Zone SP Tab)

0-10 o/p Operation



[>(SP+DB)] [>(SP+DB+F3)]

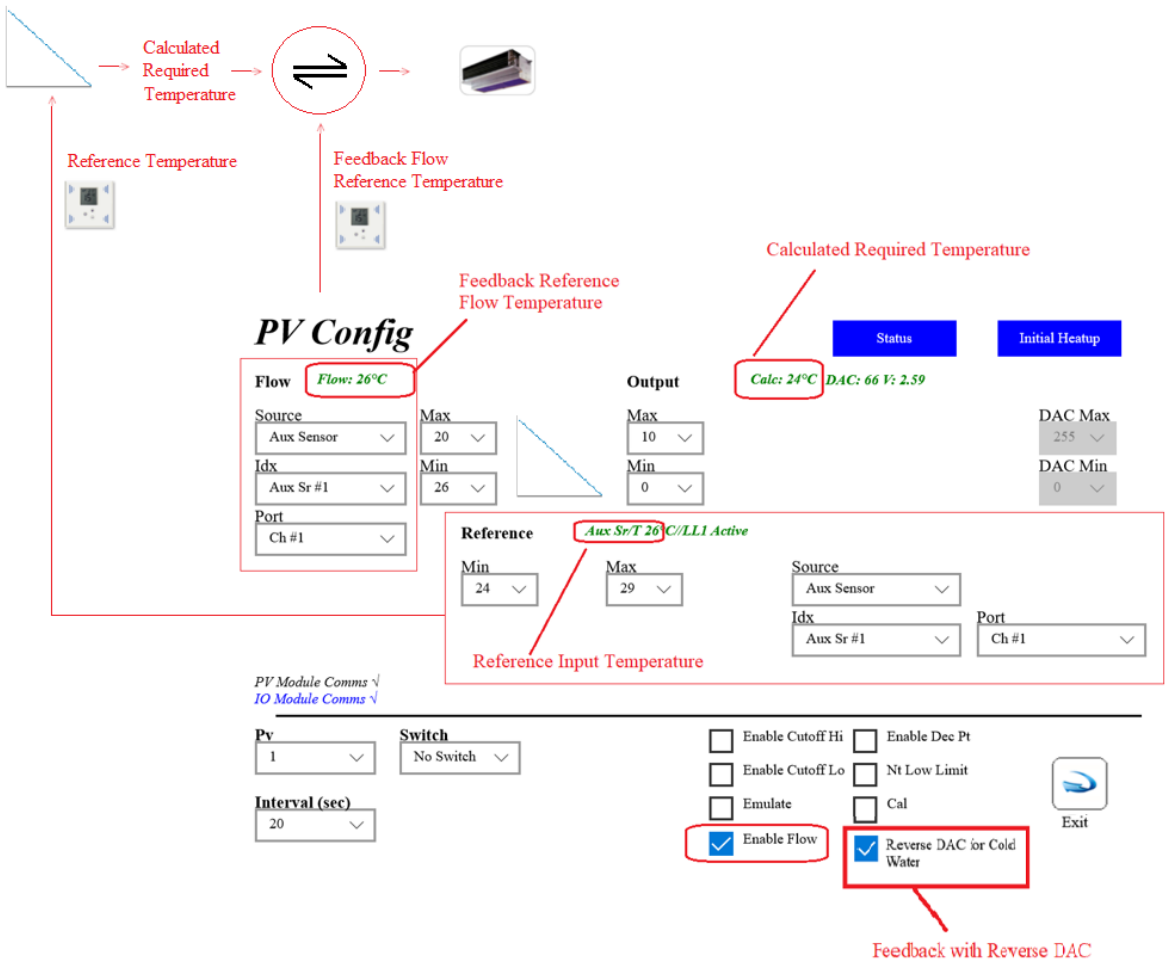
[21+2] [21+2+5]

[23°] [28°]

[Range 5 Steps]

PV Configuration – Feedback System (Reverse DAC)

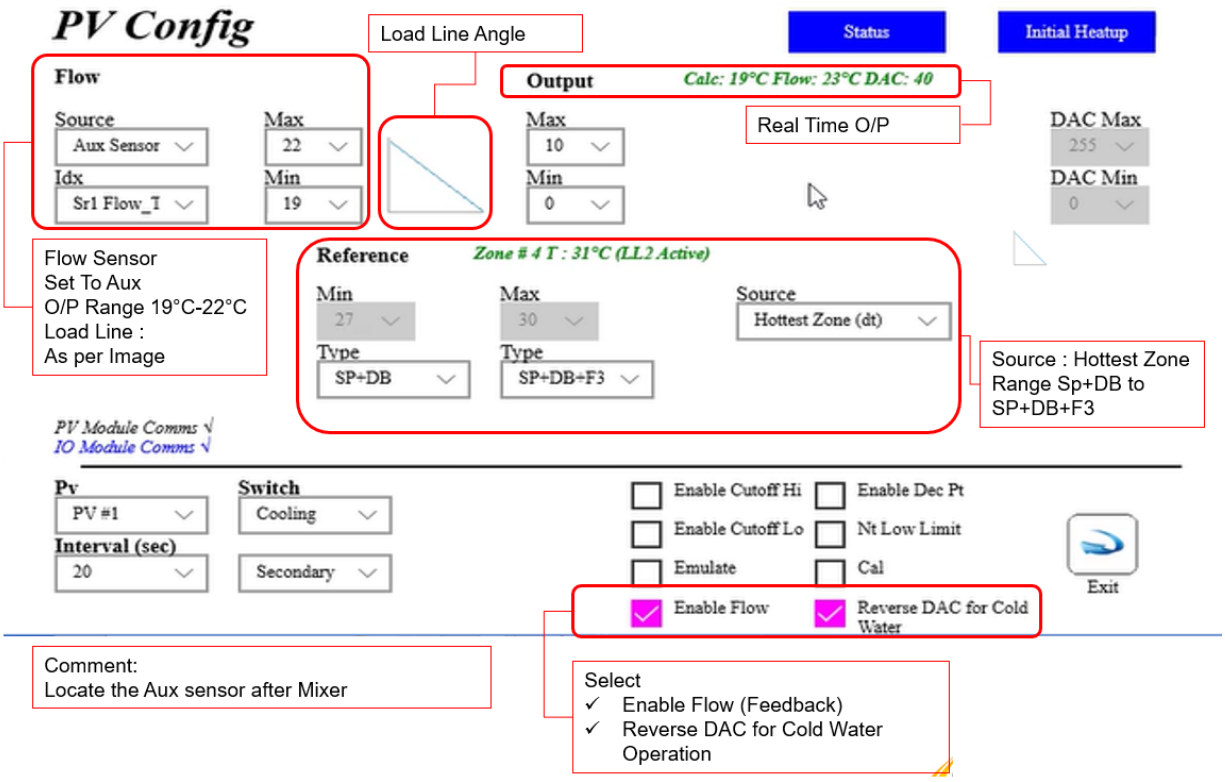
In the feedback system the 0-10v output is determined by comparing a Calculated Required Output with a Flow Temperature.



The Output Voltage is increased when the Flow Temperature is greater than the Calculated Temperature and decreased when the Flow Temperature is less than the Calculated Temperature. The greater the difference the greater the change in the DAC.

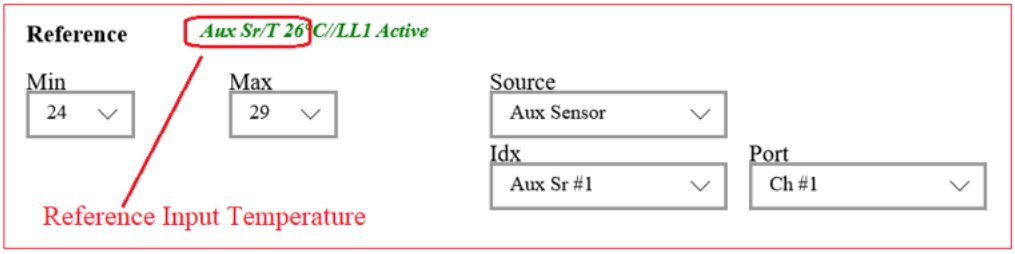
Parameter settings are detailed in “Parameter Settings” Chapter.

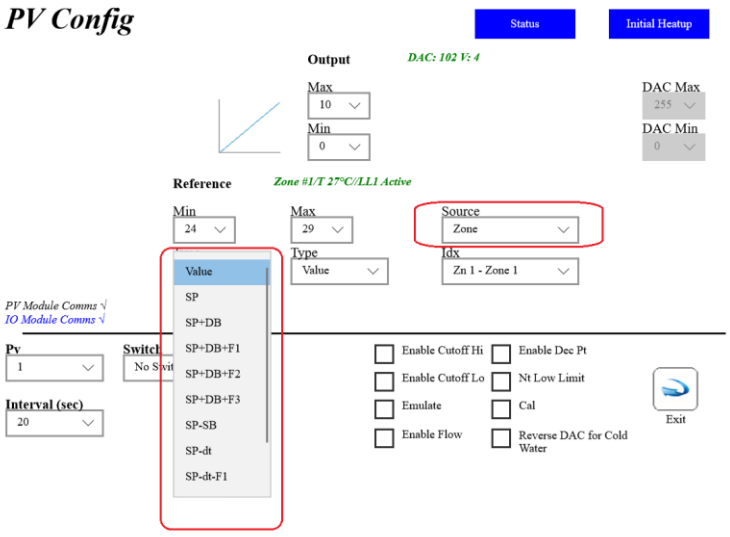
Example - Cooling via UFH Pipe work



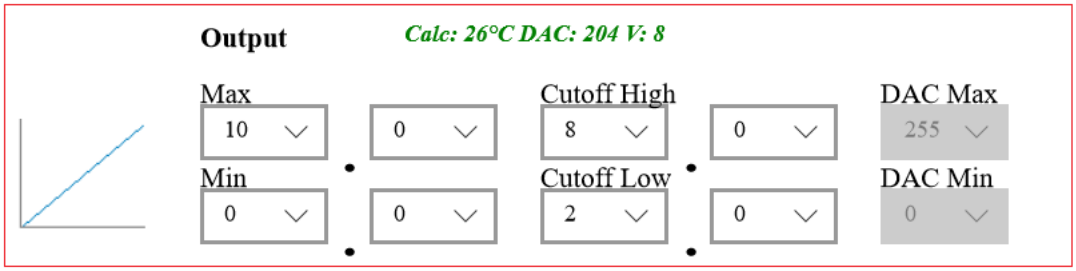
Parameter Settings

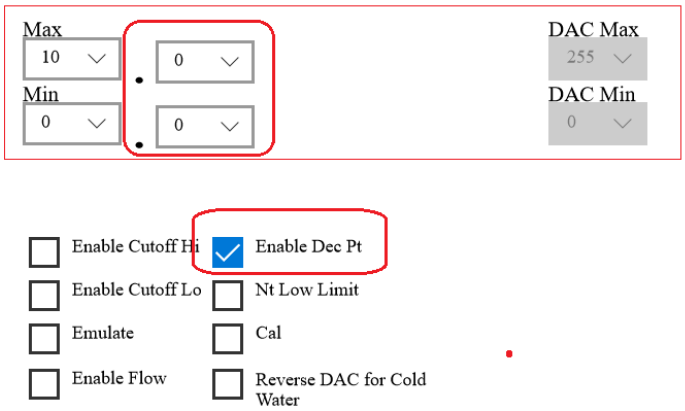
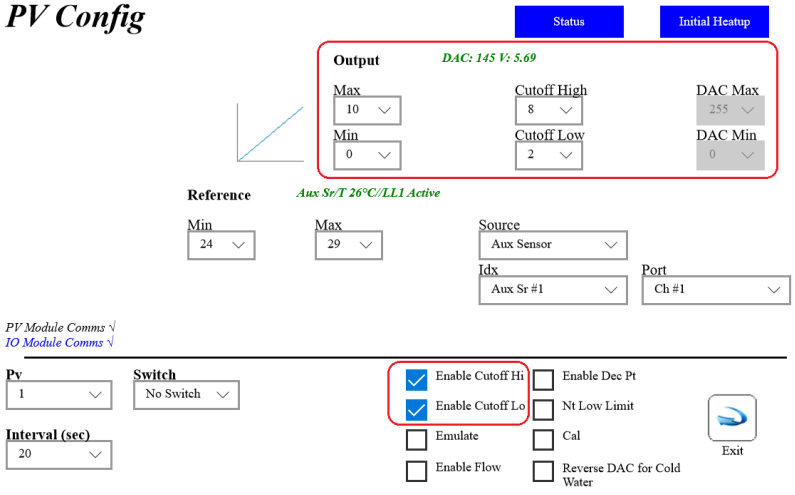
Reference Settings

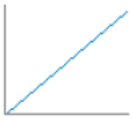
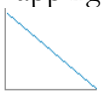


Parameter	Description
Source, Idx	Set the Reference input source: a. Auxiliary Sensor (1 to 9) b. Zone (1 to 32) c. I/O, Port (IO 1 to 8 , Port 1 to 8. Only applies to the cc773 (R10i8) module). d. Hottest Zone (Automatically selects the hottest zone with cooling). e. Manual (The input is set in the Master Mode Screen when "Enable Floor Temperature Adjust" is enabled in the environment screen).
Max, Min	The Max and Min limit boundaries for the Reference input. The Zone and Hottest Zone, Max and Min may be set as an absolute value or relative to the Zone Set-Point. 

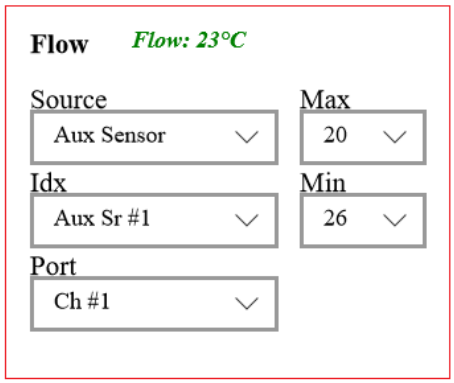
Output Settings



Parameter	Description
Max, Min (v)	Max and Min set the boundaries limits for the calculated output.
Enable Dec Pt	Check "Enable Dec Pt" add one decimal place. 
Enable Cutoff Hi, Enable Cutoff Low	Cutoff High and Low is enabled by checking "Enable Cutoff Hi" and/or the "Enable Cutoff Lo"  For example, if Cutoff Hi is set to 8v and the calculated output is 9v then the output will be clamped to 8v Max.

Load Line 	The characteristic of the load line as set by the Max & Min of the Reference and Output. Tapping the load line will change its direction from  to  and vice versa.

Flow Settings



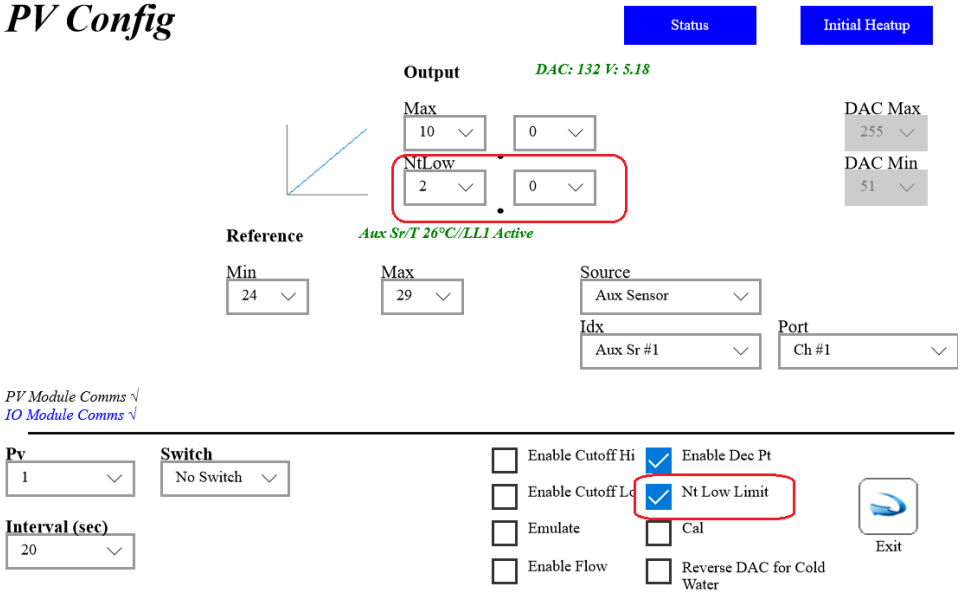
Parameter	Description
Source, Idx	Set the Flow Source: a. Auxiliary Sensor (1 to 9) b. I/O, Port (IO 1 to 8 , Port 1 to 8. Only applies to the cc773 (R10i8) module).
Max, Min	The Max and Min limit boundaries for the Flow source.

PV Interval

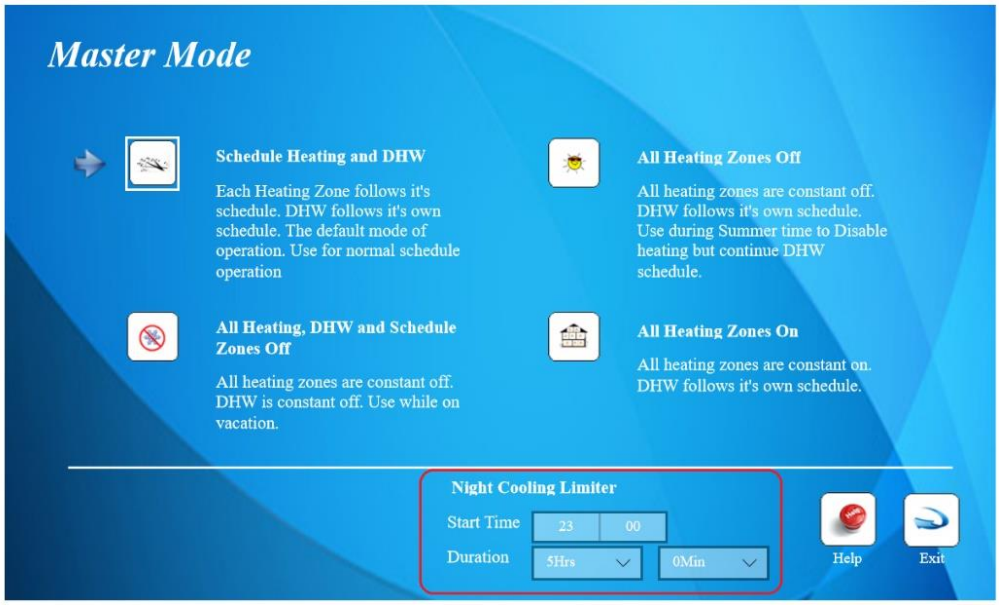
The PV Interval sets the time between PV calculations.

Night Time Output Low Limit

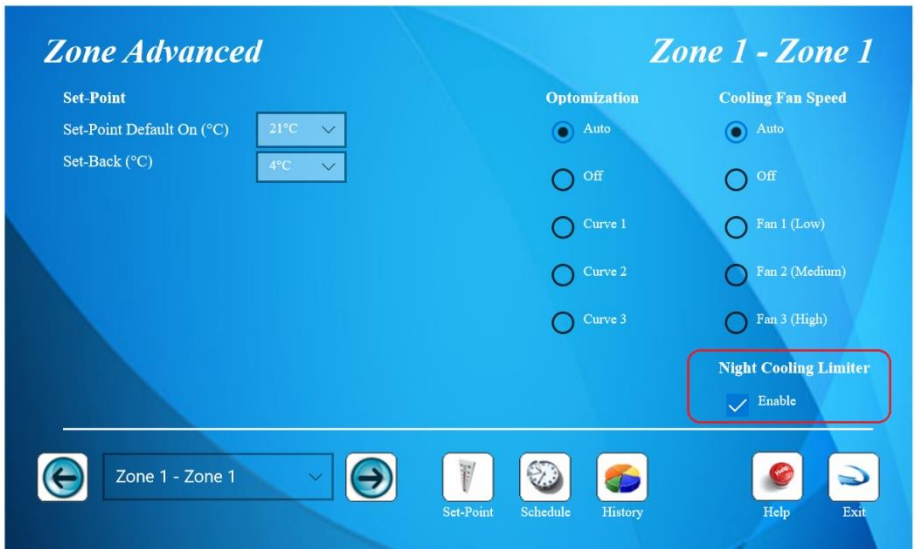
The Night Time Low Limit override the 0-10V and forces the output to the Night Time Limit value (2.0v in the above example) at set time and for a set duration.



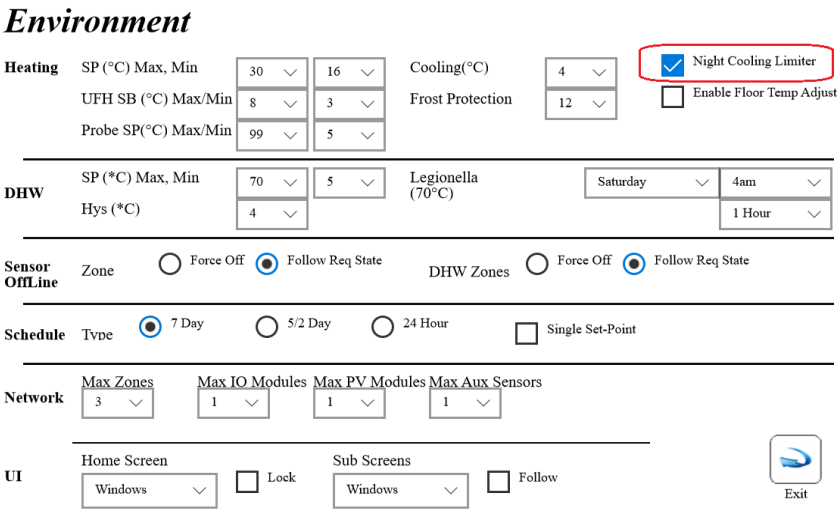
The time and duration are programmed in the Master Mode Screen.



Each zone must be individually enabled in the Zone Advance Screen.

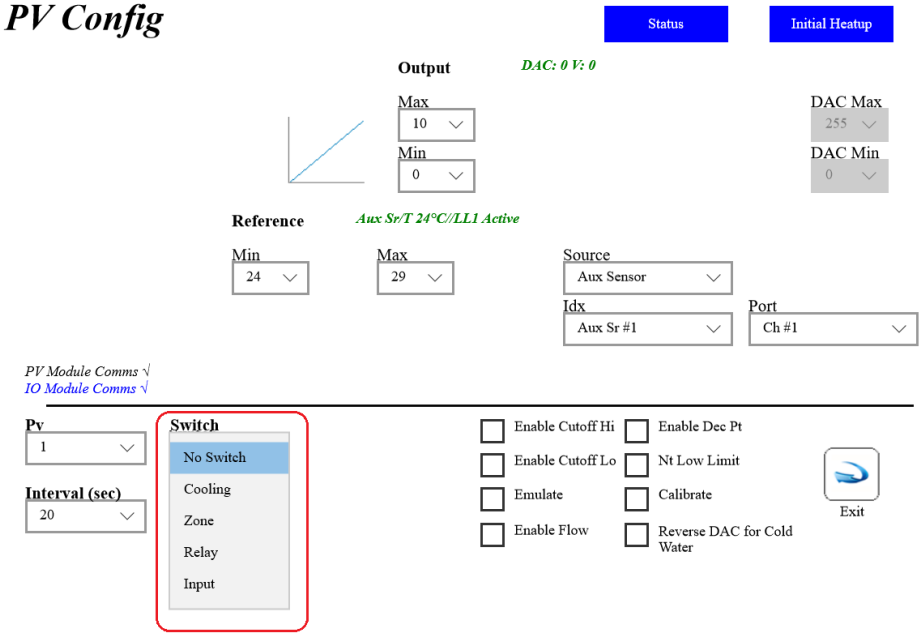


This function is Enabled with the Cooling Module and must also be Enabled in the Environment Screen.

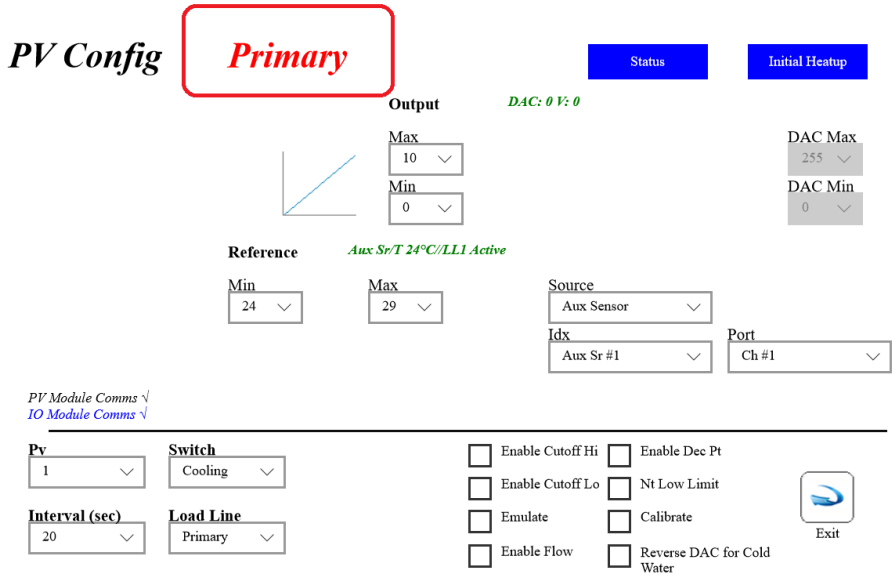


Switch

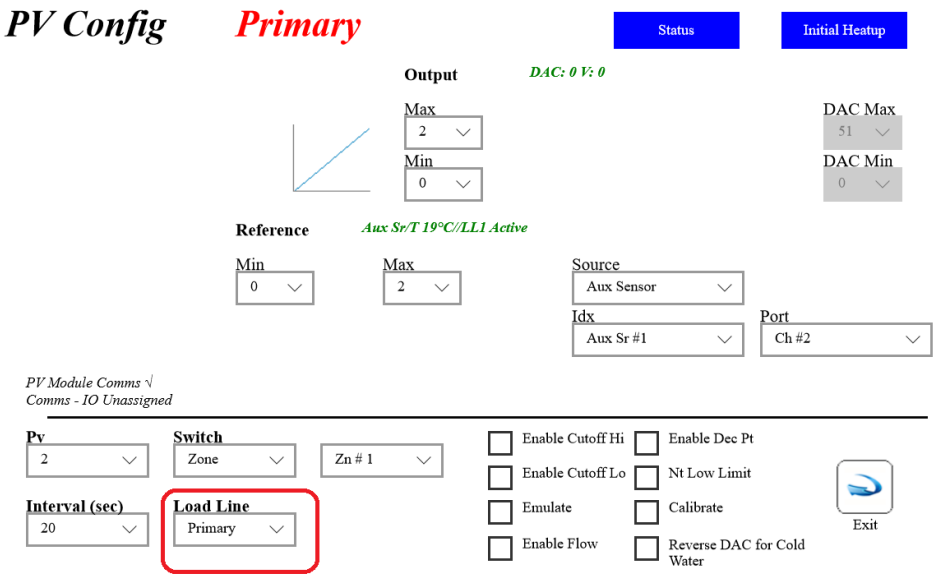
There are two PV Load Line Configurations associated with each PV output: a Primary and a Secondary. "Switch" condition is active then control of the output switches from the Primary to the Secondary Load Line configuration. For instance, if Switch is set to Cooling then control of the output switches from the Primary to the Secondary Load Line Configuration when cooling is active.



When switch is active (not set to "No Switch") then the Active Load Line will be displayed in red.

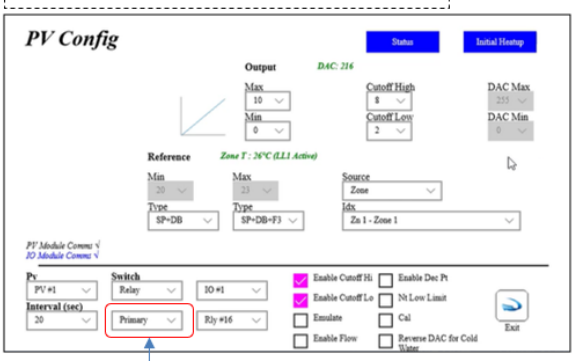


Use the "Load Line" to program the Primary and Secondary Load Lines.

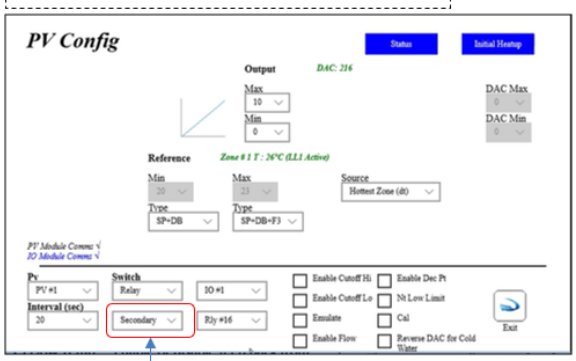


Example - Switch on Cooling (Primary: Zone & Secondary: Hottest Zone)

Load Line A (Primary)



Load Line B (Secondary)



Load Line A

Comment	Typical App Cooling Modulation Ref Individual Zones	
Reference	Source	Zone
	Idx	Kitchen
	Min	SP+DB
	Max	SP+DB+F3
☐ Flow Temp:	Enable or disable feed back from flow sensor Normally disable for e.g. FCU	

Load Line B

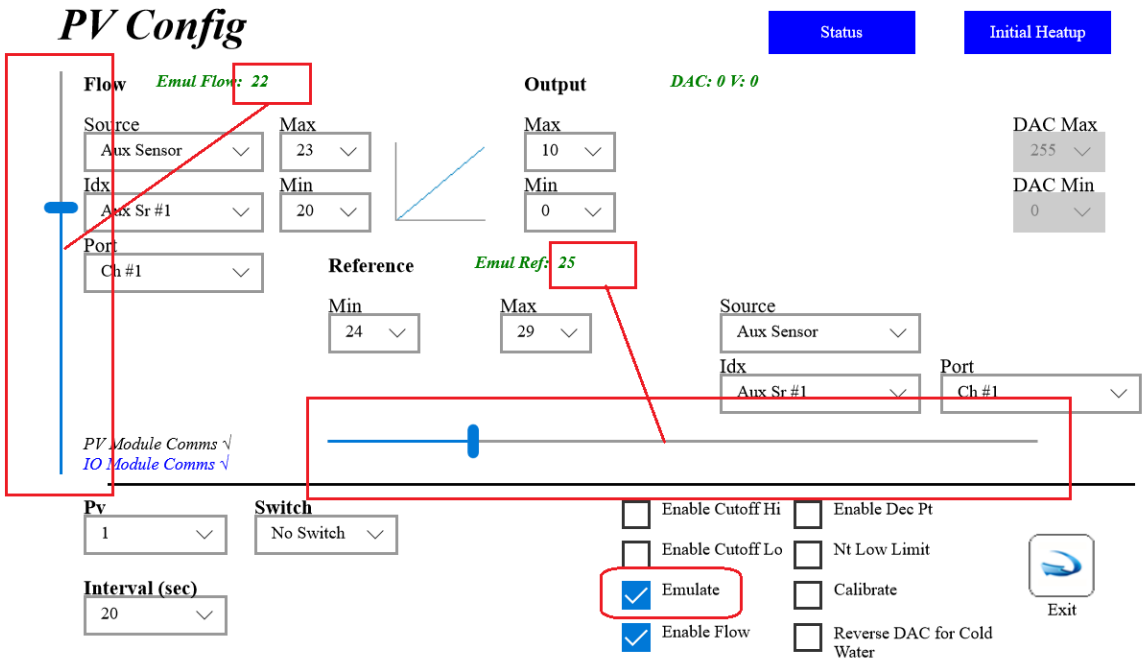
Comment	Typical App Cooling Modulation Ref Hottest Zones	
Reference	Source	Hottest Zone (dt)
	Idx	(n/a)
	Min	SP+DB
	Max	SP+DB+F3
☐ Flow Temp:	Enable or disable feed back from flow sensor Normally disable for e.g. FCU	

NOTE: If Hottest zone is used then NT limiter will only be applied if Nt Limiter is enabled in the hottest zone (this effectively means that ALL zones must enable NT limiter).

Hottest Zone (dt)
The system is intelligent, it first finds the hottest zone and uses it Delta Temp (dt) difference between it's Room Temp & Room SP+DB, to decide mix o/p

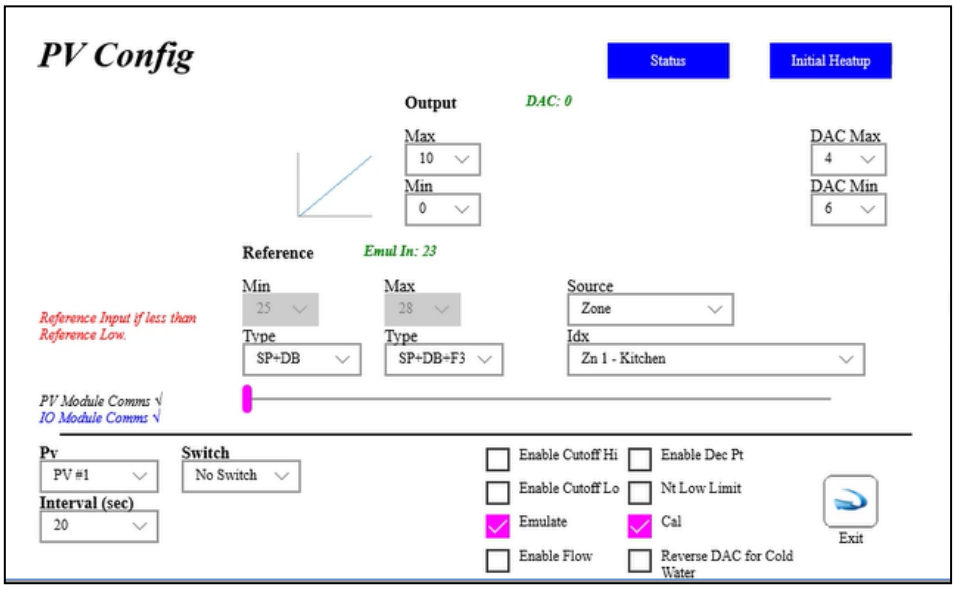
Emulation

A PV Configuration may be tested by checking the "Emulate" checkbox". Emulation slider bars will be displayed for the Reference and Feedback Flow Temperatures.



Calibration

The Max & Min Output voltage for each 0-10v output can be calibrated to suit the attached Mixer or Fan Coil unit (FCU). The following calibration procedure is used to calibrate against a FCU. This ensures the minimum and maximum voltage output levels correspond with requirements.



Step	Description
1	Select the required PV (Proportional Valve) channel (1-16).
2	With the FCU attached to the required 0-10v output, place a DVM (Digital Volt Meter) on the output and set the range to DC volts.
3	Check the "Cal" and "Emulate" functions on the screen. The DAC Min & DAC Max can now be adjusted .
4	Calibrate the Min output voltage: a. Set Cut Off Low to 2 v (Dac=51) b. Use the Emulate slider bar to move the output to its 1st increment setting c. The system will detect the min is 2v and try to output 2v d. Now calibrate the min to 2v
5	Calibrate the Max output voltage: a. Use the Emulate slider bar to move the output to its maximum setting b. Now calibrate the Max output voltage
6	Uncheck the "Cal" and "Emulate" functions when calibration is complete.

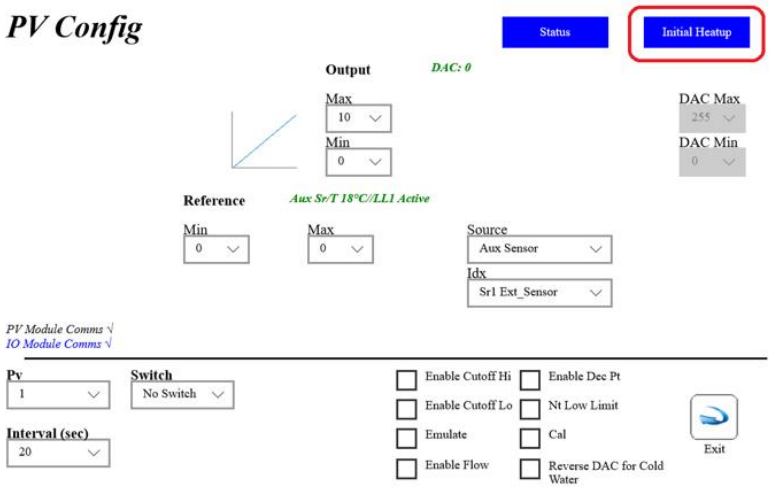
Initial Heat Up Sequence

The UFH Initial Heat Up Sequence is used to heat the screed gradually over time.

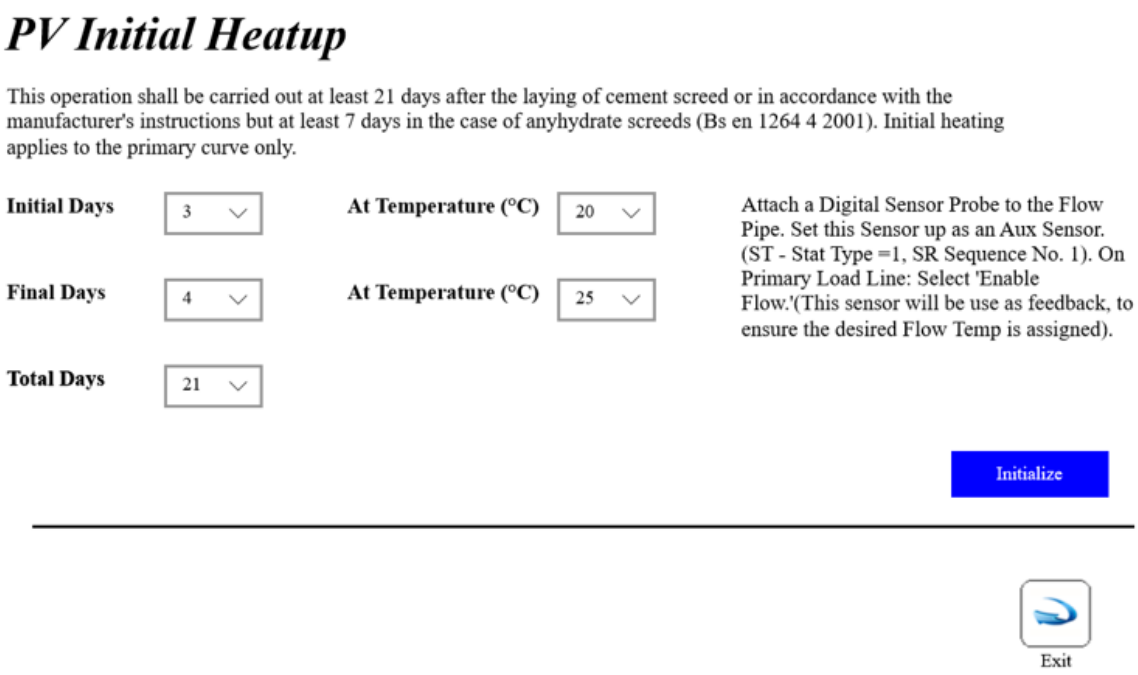
This operation shall be carried out at least 21 days after the laying of cement screed or in accordance with the manufacturer's instructions but at least 7 days in the case of anyhydrate screeds (Bs en 1264 4 2001). Initial heating applies to the primary curve only.

The Initial Heat Up Sequence is applied to the primary curve (loadline) only.

Up to 40 initialization Heat Up Sequences can be managed simultaneously.



Press "Initial Heat Up" to enter setup.

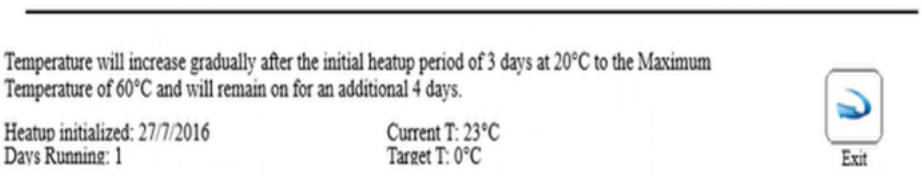


Setup

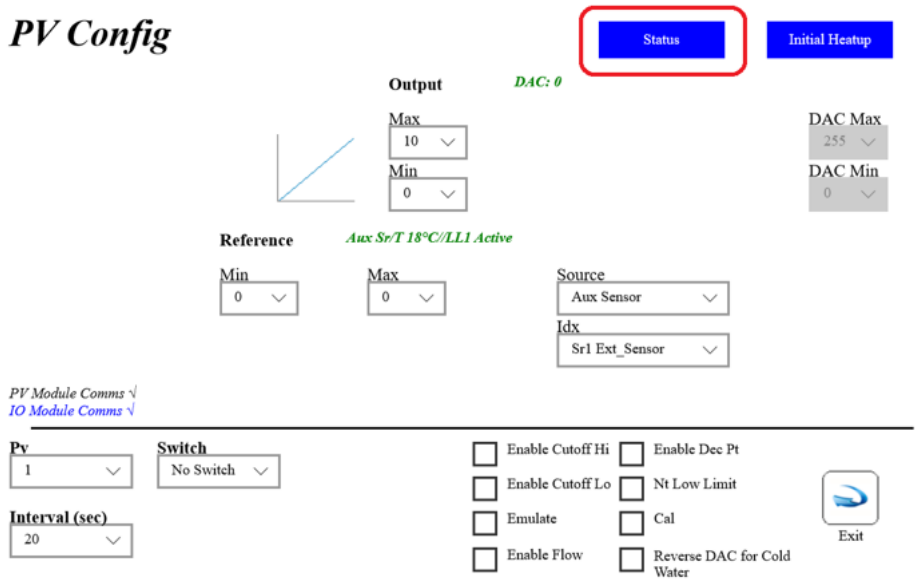
Steps	Description
1	Attach a Digital Sensor & Probe to the Flow Pipe.
2	Set the Digital Sensor up as an Aux Sensor. (ST - Stat Type =1, SR Sequence No. 1)
3	On Primary Load Line: Select "Enable Flow". This sensor will be used as feedback, to ensure the desired Flow Temp is assigned.
4	Attach Mixer to the 0-10v port on the relevant I/O module.
5	Confirm the Heat Up sequence settings: **Initial Days** 3 **At Temperature (°C)** 20 **Final Days** 4 **At Temperature (°C)** 25 **Total Days** 21
5	Press the "Initialize" Button.

Status

The current status will be displayed once the Heat Up sequence has been initialized.



PV Status



Pressing the "**Status**" button will display the status for all 16 PV channels.

Pv	DAC	Tmr (secs)	Comms IO	PV
1	0	13	IO #1 √	PV #1 √
2	0	14		PV #2 x
3	0	15		
4	0	16		
5	0	17		
6	0	18		
7	0	19		
8	0	20		
9	0	1		
10	0	2		
11	0	3		
12	0	4		
13	0	5		
14	0	6		
15	0	7		
16	0	8		

Key:

PV: PV channels

DAC: Raw DAC Output

Tmr (Sec): Countdown to the next DAC update

Comms: Communications Status for IO cc771 and PV8 Modules.

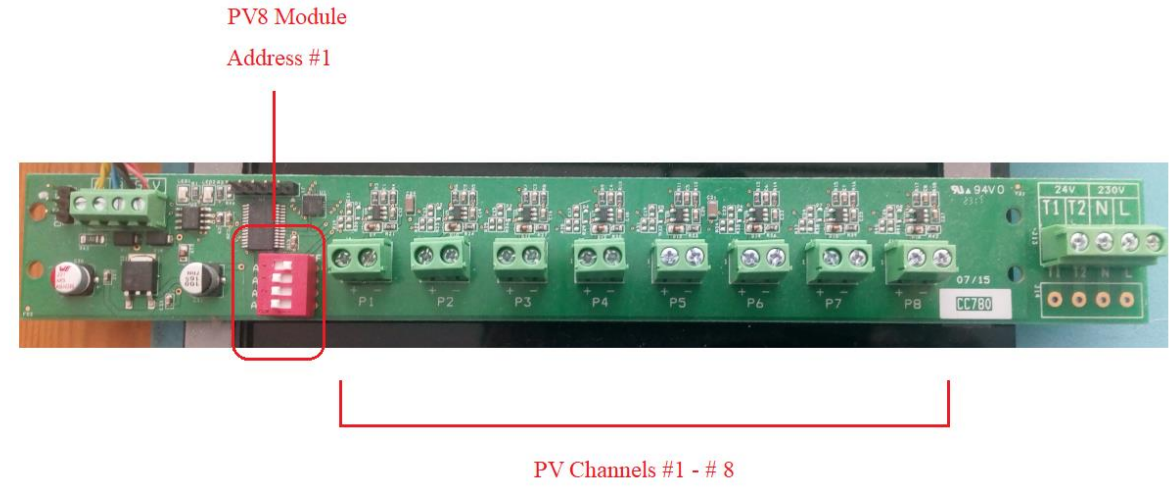
Addressing

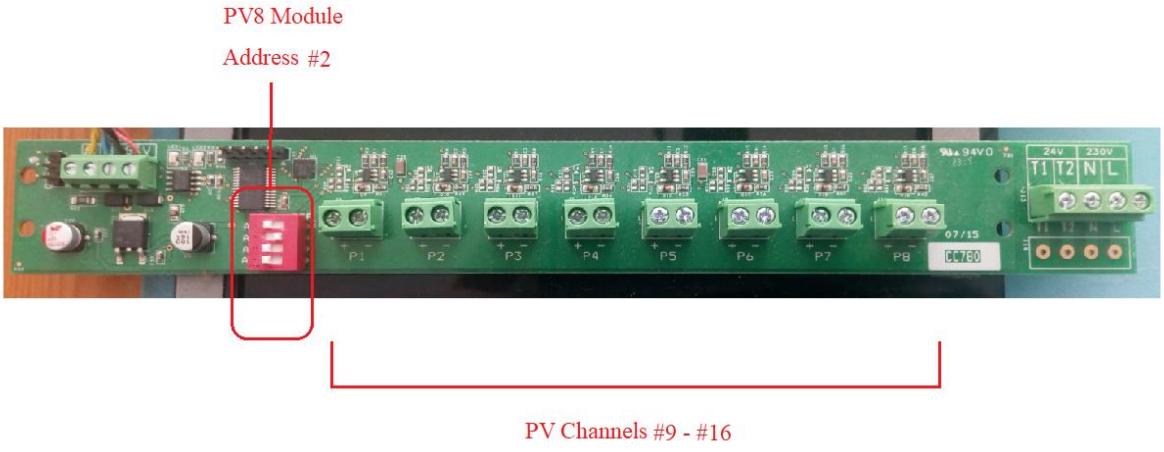
Addressing cc771(R16)

The cc771 (R16) has a single PV channel. The address of the module also sets the address PV channel. For instance, The PV channel for cc771 Module #1 is #1. The PV channel for cc771 Module #2 is #2.

Addressing PV8

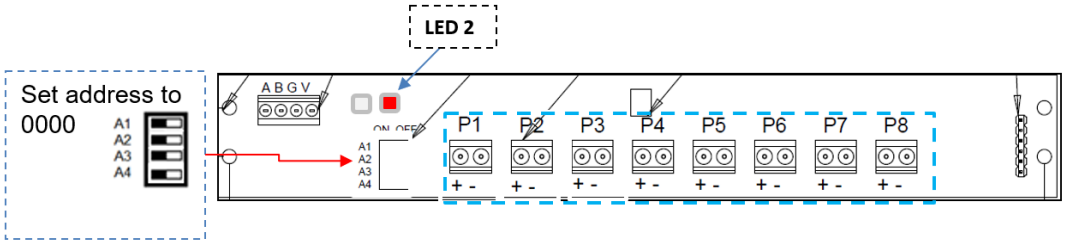
The PV8 Module has 8 PV channels. PV channels 1-8 are on the PV8 module with address #1. PV channels 9-16 are on the PV8 module with address #2.





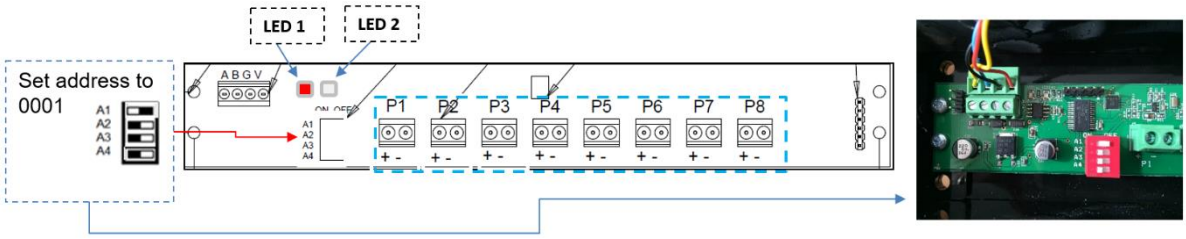
Diagnostic

PV 0-10v Channel Output Test Procedure



Step	Description	Result
1	Set address to 0000	
2	Power on the board with no A & B attached. LED 2 will remain ON in Red (No Comms)	PV output voltage on all ports will be 10v
3	Move A3 address switch to right (on position)	PV output voltage on all ports will be approx. 4v
4	Move A3 address switch to left (off position)	
5	Move A4 address switch to right	PV output voltage on all ports will be approx. 8v

PV8 Module Communication Test Procedure



Step	Description	Result
1	Set address to 0001 (A1 On)	
2	Power on the boards with A & B attached to the cc200 HV3 (the system must be setup with a single PV module)	Led 2 will remain ON in Red until communication is received and then switch OFF. Led 1 will start flashing during communication: ON = Receiving Off = Transmitting