

## **BARCamm GLOSSARY - ISSUE 1.0 - Jan 97**

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Terms added  
Reordered in Alphabetical order

RMck  
JFH

Following a request by members of the Training & Contracting sections of the BRA, and in line with its own standardisation program BARCamm has produced this glossary of terms used in refrigeration controllers.

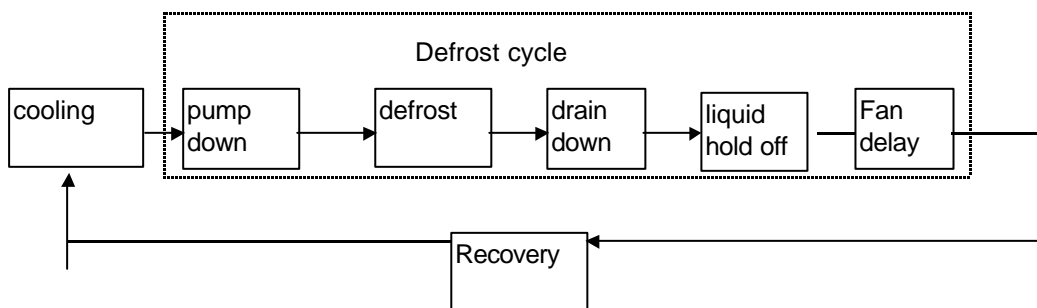
Differences in usage by different manufactures are explained & alternative terms likely to be encountered in textbooks or manufacturer's literature have been included. The intention however is to use the preferred terms in all future BARCamm controllers.

It is expected that this glossary will be used by BARCamm members and also as part of the training programme for users and installers.

Air on evap. temperature	The temperature of the air before it is blown through the evaporator. different control or case manufacturers may recommend slightly different temperature sensor positions so the term is a little ambiguous. Alternatives return air ;Air-On ; return air Literal translations for continental European literature are air-off product so literature for this source may use "Air-Off" meaning "Air-On".
Air-Off Evap.	As above interchanging on for off and "delivery"for" return air". "
Apparent superheat	(evap. temp out - evap. temp in). If the fluid in the evaporator is saturated and the sensor positions are well chosen this is often used as a substitute for superheat and is sometimes referred to as superheat.
Battery backed memory	Data storage device which keeps its data even when external power is removed, because of an internal battery
CDROM	Optical non-reuseable removeable data storage medium. The data is stored optically and the storage capacity is very high compared to magnetic storage devices
Command	This must be qualified e.g. fan command compressor command.. Appropriate values are on; off; running; open;closed. It is the status which a controller expects of a device as a result of the signal which the controller is sending to it. The term is similar in some ways to "set point" but it is used where there is no control feedback external to the controller Alternatives are ; Demand.
Control	As in control temperature; control pressure etc. The value of the variable which the controller is attempting to control.
Cooling	During the cooling state the control objective is to maintain case temperature and perform normal monitoring and alarm detection functions. It generally lasts for a period set by "defrost frequency", "defrost pattern" or "defrost sequence" Used in this sense, "the case is in the cooling state" does not necessarily imply that the temperature is falling. Alternatives are:- normal cycling; refrigerating.

CPU	Central processing unit at the heart of a computer
Cut in Temperature	This applies to a refrigeration thermostat . It is the temperature which will cause the thermostat to bring refrigeration on.
Cut-OutTemperature	As above substituting “off” for “on”. Differential = Cut in temperature - cut out temperature.
Data faulty	This is a preferred string to appear if some data is requested but either.  (a) Nothing recognises what is wanted or  (b) The returned data is suspect.
Defrost	When “defrost” is used to refer to a controller state it only includes the active part of the defrost cycle.  (a) If there is heating involved in defrosting and the heating is not cycled on & off then “defrost” comprises only the period where the heating is enabled  (b) If heating is involved but the heater may be cycled on & off:- “defrost” comprises the condition in which heating is possible if suitable temperatures obtain.  (c) If no heating is involved:- “defrost” comprises the period where refrigeration is are switched off to allow the ice to melt.  In all cases the defrost state <u>excludes</u> drain down; liquid hold off; fan delay; Recovery.  Defrost generally lasts until some temperature is achieved or until some time conditions are met.
Defrost Cycle	“Defrost cycle” refers to a sequence of states associated with defrosting. It includes all the states where heating is on or refrigeration is off or fans are off because of defrosting.

Example of Defrost cycle



Defrost frequency	As vernacular. It is only appropriate if the time between defrosts is constant.
Defrost method	Appropriate values are "Hot gas" "Electric" etc
Defrost termination method	This refers to the means whereby a case controller initiates a defrost, or gains information that its case is being defrosted by external agency. Appropriate methods are "locally timed" "self detected" "network demanded" etc
Defrost termination Method	Appropriate methods are "time" "temperature".
Defrost initiation temperature	Sometimes defrosting is initiated in a pack and a case controller needs to deduce that this has happened by observing case temperatures (e.g evaporator temperature out). The critical temperature is known as "defrost initiation temperature".
Defrost pattern	As vernacular It is used if the time between defrosts may not be constant but nevertheless forms a simply describable pattern
Defrost pattern start time	The start time for one of the defrosts if there is a defrost frequency or the start time for the 1st defrost in the defrost pattern.
Defrost schedule	List of defrost start times.
Defrost Termination	This is the situation which obtains at the end of the defrost state defined above. Note that it is not necessarily the point at which the defrost heating is switched off, nor the point at which refrigeration is enabled.
Defrost method	Appropriate values are "Hot gas" "Electric" etc
Defrost termination method	Appropriate methods are "time" "temperature"
Differential	This applies to controllers whose output is either on or off. It is the difference between the value of the control variable which will cause switching on and the value which will cause switching off. Alternatives are :- hysteresis
Discharge pressure	Pressure at compressor outlet alternative :- Head pressure
Drain Down	This is state after defrost where neither heating nor refrigeration is enabled. Often fans are held off also. It generally lasts for a set time
Evap	Evaporator
Evaporator pressure	Pressure at evaporator outlet

Evap. temp in	Temperature of evaporator close to where the liquid comes in. Different manufacturers may recommend slightly different position for the temperature sensor so the term is slightly ambiguous. Alternatives are:- saturated gas temperature:
Evap. temp out	Temperature of the evaporator close to the suction line. Alternatives are :-superheated gas temperature; suction temperature.
Evaporator	Evaporator coil alternatives are :- Evaporator; coil
Expansion valve	as vernacular There are different types such as Pulsed expansion valve, thermostatic expansion valve, stepper-motor expansion valve.
Fan delay	This is a state after defrost where refrigeration is enabled but fans are held off. It generally lasts for a certain time, or until a temperature is low enough to suggest that water will have frozen on the evaporator.
Firmware	Software permanently installed in something i.e. only changeable by replacing a physical object (e.g. a prom)
Floppy disc	Removeable, reuseable data storage medium. The data is stored magnetically and the floppy disc may well be rigid in spite of its name.
Hard disc	Permanently installed reuseable data storage device
Limit	E.g. maximum limit; minimum limit. Extreme values which a controller should not try and exceed regardless of its main control objectives. The term must be qualified e.g. maximum temperature limit.
Liquid hold off	This is a state after defrost where refrigeration is kept off until nearby cases are also ready for refrigeration to resume.
Modem	Box that allows serial data to be sent through the analogue (PSTN) telephone network.
Multidrop Communication	Technique which allows several devices to communicate over shared cables.
Network controller	Object at the heart of a networked system where all network traffic is routed. ( N.B some networks do not have such an object) Alternatives Supervisor ; Data concentrator ; Communications unit
Non-volatile memory	Any data storage device which keeps its data even if power is removed. The phrase is particularly used in the context of remembering settings.
Not available	This is a preferred string to appear if some requested data is not available. The condition arises if the equipment from which the data is requested, recognises the data request but has not been built to provide it.
Parameter	Value which determines the specific operating details of a piece of equipment. Parameters remain fixed as far as the operation of equipment is concerned but might be alterable by an external agency.

PC	Originally "Personal Computer" . IBM compatible computer comprising CPU, memory storage devices, keyboard and monitor, or equivalent human interfaces.
PCB	"Printed Circuit Board" refers to the board on which electronic assemblies are generally constructed. PCB is often used however to refer to the electronic assembly itself - excluding boxing or mounting hardware.
PROM	A PROM is one particular embodiment of firmware. It is generally a rectangular black slab of plastic a few centimeters long with metal fingers every couple of mm along two or four sides and labelled to identify the program which it embodies.. Often it is socketted, and sometimes it may be possible to change the behaviour of a controller by replacing the PROM. It is important that proper care is taken when handling and replacing PROMS. .
Protocol	Agreed method of communicating between two or more devices. There are for instance protocols relating to wiring or radio transmission etc ; protocols concerning signals and signal strengths (voltages between 2 & 7V - 205Mhz etc) ; protocols concerning signal interpretation ( English morse code etc)
Pump Down	This is a state preceding defrost where a refrigerant is sucked out of the evaporator prior to any defrost heating. Generally it lasts for a fixed time (if it exists at all).
RAM	Working memory of a computer
Real time clock	Clock which provides time of day information (& often date as well) - usually battery backed. Clocks which are not real time clocks are concerned with time between event regardless when they occur.
Recovery	After the defrost cycle is complete and all attempts to refrigerate are resumed, there is often a period during which high temperature alarms are suppressed and temperature displays may be inhibited. This state is known as "recovery". It generally lasts for a set time or until temperature conditions suggest that satisfactory refrigeration has been achieved
Refrigeration System type	Refers to the means of distributing refrigerant. Appropriate types are "Two pipe" or "Three pipe" etc
RS232	Standard method of communicating serially by cable between two pieces of equipment up to 15meters or so apart.
RS485	Standard method of multidrop communication
Serial communication	A means of allowing a single cable to carry several independent data streams.

Setpoint	<p>The term must be qualified e.g. temperature set point. It is the value which the controller should attempt to coax from the equipment which it is installed in. If the controller exhibits a differential, the term “set point” is ambiguous. e.g. in a refrigeration thermostat some manufacturers take the set point to be the temperature above which refrigeration should come in; Some take it to be the temperature below which refrigeration is switched off; some take it to be mid way between. It is necessary to consult manufacturers literature.</p> <p>The term is similar in some ways to “command” but “set point” is used where there is a feed back mechanism external to the controller.</p> <p>Alternatives are Setting; Set Value; Demand.</p>
Set up unit	<p>Some controllers have a facility for a local interrogation unit to be plugged in to read controller information or alter controller parameters. Alternatives are Hand-held-unit ; Maintenance unit.</p>
Setting	<p>Any parameter which may be changed .This includes “set point” but includes such things as time delays Alternatives are Set value;</p>
State	<p>It is often convenient to describe controller operation as a sequence of states. A state comprises the control objectives for the state and the conditions which must obtain for the control objectives to change. As an example, a case controller might be described as a sequence of states consisting of normal cycling; defrost; recovery and back to normal cycling.</p>
Status	<p>This must be qualified e.g. fan status; compressor status etc. Appropriate value of status are on; off; 39%; running; open; closed etc. It is the reported conditions of some monitored device. Occasionally “status” may have been used to refer to the conditions which device should be in if it is wired &amp; working properly. It is recommended that the term “command” be used for to express this in future.</p>
Suction pressure	Pressure at compressor inlet
Superheat	as vernacular.
Temperature sensor	As vernacular Alternatives are :- temperature probe; probe
Terminal adaptor	Box that allows serial data to be sent through the digital (ISDN) telephone network.
Thermostat	As vernacular
User interface	Device on a network which allows a user to monitor and control the system. It may for instance consist of a keyboard and monitor or it may be an alarm panel with a few buttons. Quite often it is within the same assembly as a network controller and words like “supervisor” “data concentrator” “communications unit” refer to the network controller and the user interface combined.

## Weighting

It is often useful to calculate a value (calc), which is intermediate between two others. (input1 & input2).

The average of two values is a special case where the weighting is 50%. The weighting determines which of the two inputs is favoured.

$$\text{calc} = \text{input1} \times \text{weighting} + \text{input2} \times (1 - \text{weighting})$$

It is necessary to qualify "weighting" with the names of the inputs. E.g. Air-on:air-off weighting. (this favours air-on if weighting is large). It may also be qualified by a description of the purpose for which the weighting is done. Weighting is commonly used in temperature controllers where air-on-evap and air-off-evap temperatures are the only measured temperatures available. The best estimate of product temperature is some intermediate value between the two. For control best control a different intermediate value may be best.