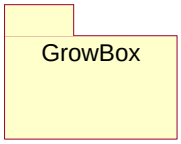

GrowBox is a Windows NT Application which uses a Hygrosense Humidity/Temperature Sensor as input equipment to control the climate within a growbox.

Please be aware, that It was developped as prototype application, not as an end user application. Eg. all the user input values had intentionally been hardcoded into the source files or written to GrowBox.ini file, what is ok for a prototype, but not for an end user application. It is usually running within VC++ 6.0 in debug mode.

It controls humidifictaion equipment and ventilation equipment in order to keep a humidity of approximately 90% rH inside a microbiological growbox. These equipments are controlled via a parallel port relais board (kemo-electronic.de / conrad.de) or USB Relais Board (Hygrosens REL8HC IN8).

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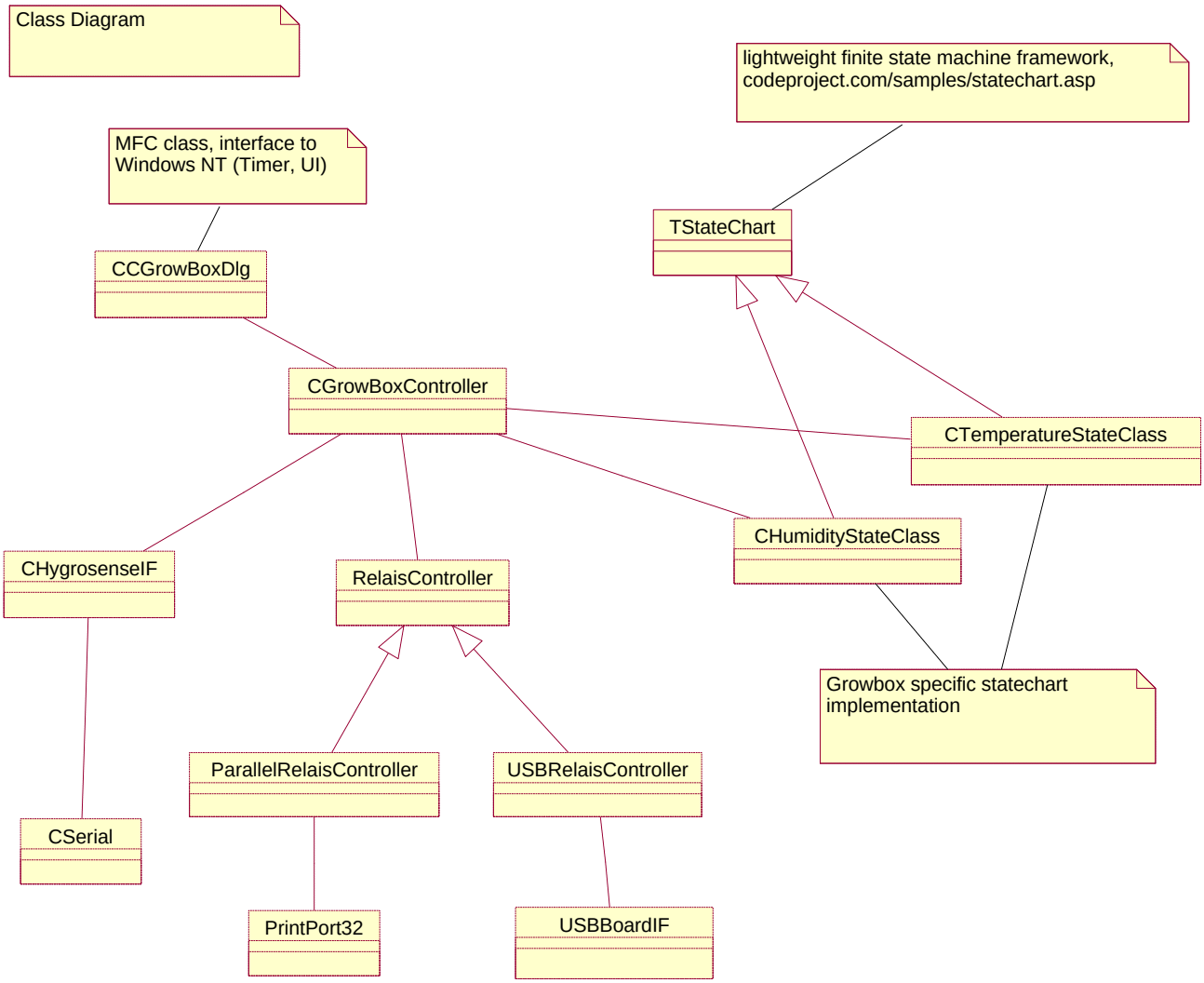
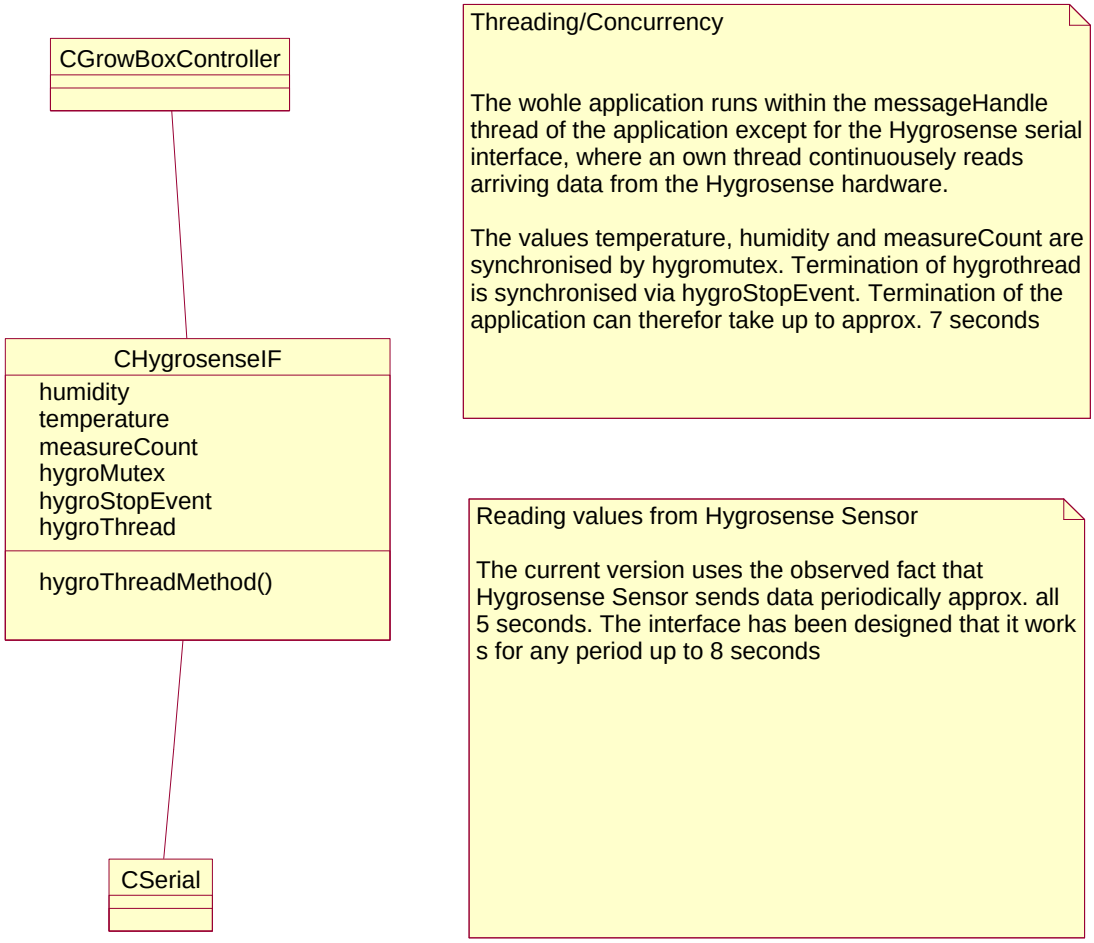
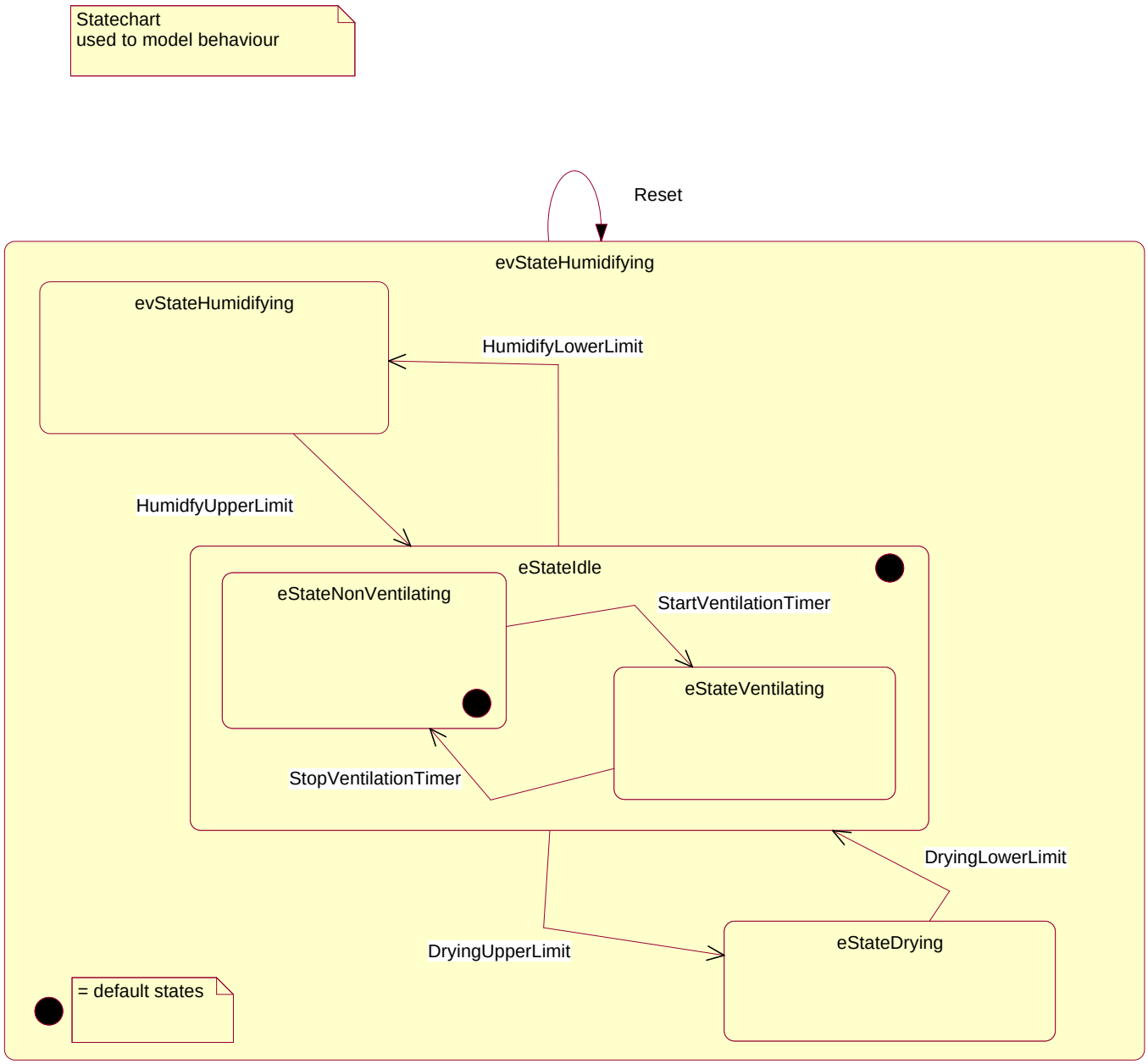
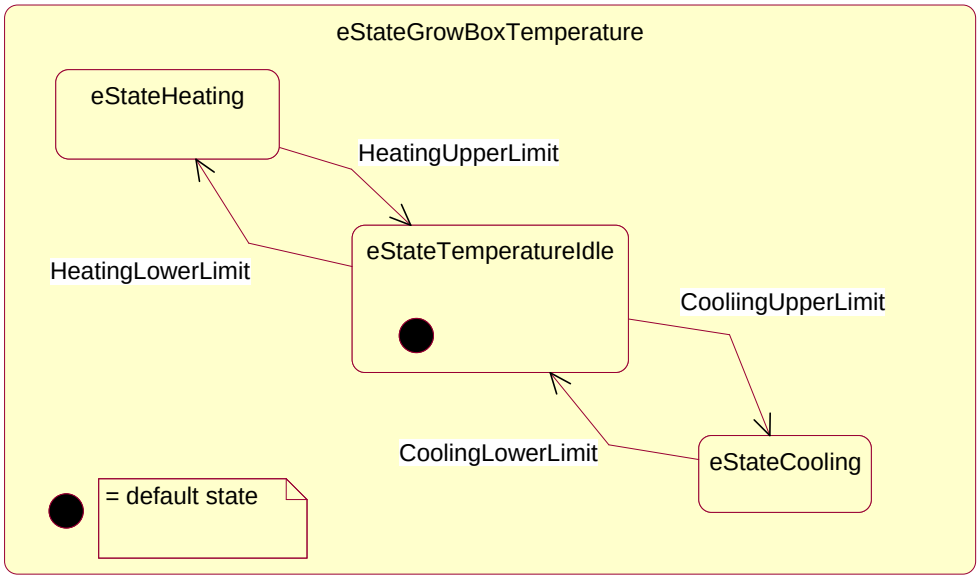
(any feedback welcome)


Class Diagram
lightweight finite state machine framework, codeproject.com/samples/statechart.asp
MFC class, interface to Windows NT (Timer, UI)
TStateChart
CCGrowBoxDlg
CGrowBoxController
CTemperatureStateClass
CHygrosenseIF
RelaisController
CHumidityStateClass
Growbox specific statechart implementation
ParallelRelaisController
USBRelaisController
CSerial
PrintPort32
USBBoardIF


CGrowBoxController
CHygrosenseIF
humidity
temperature
measureCount
hygroMutex
hygroStopEvent
hygroThread
hygroThreadMethod()
CSerial
Threading/Concurrency
The wohle application runs within the messageHandle thread of the application except for the Hygrosense serial interface, where an own thread continuousely reads arriving data from the Hygrosense hardware.
The values temperature, humidity and measureCount are synchronised by hygromutex. Termination of hygrothread is synchronised via hygroStopEvent. Termination of the application can therefor take up to approx. 7 seconds
Reading values from Hygrosense Sensor
The current version uses the observed fact that Hygrosense Sensor sends data periodically approx. all 5 seconds. The interface has been designed that it work s for any period up to 8 seconds


Statechart
used to model behaviour
Reset
evStateHumidifying
evStateHumidifying
HumidifyLowerLimit
HumidfyUpperLimit
eStateIdle
eStateNonVentilating
StartVentilationTimer
eStateVentilating
StopVentilationTimer
DryingLowerLimit
DryingUpperLimit
eStateDrying
= default states


eStateGrowBoxTemperature
eStateHeating
HeatingUpperLimit
HeatingLowerLimit
eStateTemperatureIdle
CooliingUpperLimit
CoolingLowerLimit
eStateCooling
= default state