

How to maintain and control an Intelligent Building

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www.cir-strategy.com/events/heat



Generic Control System - GCS3000

What is an Intelligent Building?

- **Functional and responsive to the occupants needs**
- **Satisfies the aims of the organisation and its stakeholders**
- **Sustainable in terms of energy and water consumption**
- **Healthy in terms of well-being for the people living and working within it**
- **Meets the long term aspirations of society maintaining minimal impact to the environment in terms of emissions and waste**

➤ **Prof Derek Clements-Croome 2009 - Chair IBG CIBSE**



**How does GCS3000 address
these issues?**

➤ Functional and responsive to the occupants needs; SIMPLE

GCS Control Panel

Controller View Insert Tools Help

Latitude: 0°0'S
Sunrise: 00:00 Sunset: 00:00

Log Overridden Alarmed Suspend

Area	Zone	Name	Type	Setpoint	Log	State	Current Value
MainBlockFlowTemp	1	MainBlkElectricity	Smart Electricity Metering	07 Jan 01	()	Monitoring	0 (€0) Σ 0 (€0)
MainBlockReturnTemp	1	AuxBlkHeat	Smart Heat Energy Metering	23 Mar 10	()	Monitoring	0 (€0) Σ 0 (€0)
AuxBlockFlowTemp	1	MainBlkHeat	Smart Heat Energy Metering	23 Mar 10	()	Monitoring	0 (€0) Σ 0 (€0)
AuxBlockReturnTemp	1	Room-833	Room Control	10.00 ± 15.00°C	()	Unoccupied / Checked Out	31.3°C
Room833-PIR	2	Room-834	Room Control	10.00 ± 15.00°C	()	Unoccupied / Checked In	18.8°C
MainBlk-Electricity	3	Room-835	Room Control	10.00 ± 15.00°C	()	Unoccupied / Checked In	12.5°C
Room833-radiator	4	Room-836	Room Control	10°C	()	Occupied / Checked Out	12.5°C
MainBlk-WaterMeter	5	Room-837	Room Control	10°C	()	Occupied / Checked In	18.8°C
AuxBlk-WaterMeter	6	Room-838	Room Control	10°C	()	Occupied / Checked Out	12.5°C
MainBlkElectricity	7	Room-839	Room Control	10.00 ± 15.00°C	()	Unoccupied / Checked Out	12.5°C
AuxBlkHeat	8	Room-840	Room Control	10.00 ± 15.00°C	()	Unoccupied / Checked In	12.5°C
MainBlkHeat							
Room-833							
Room833-LightSwitch							
End of Zone							
Zone2							
Room834-Temp							
Room834-tempSP							
Room834-radiator							
Room834-PIR							
Room834-LightSwitch							
End of Zone							
Zone3							
Room835-Temp							
Room835-tempSP							
Room835-PIR							
Room835-radiator							
Room835-LightSwitch							
End of Zone							
Zone4							
Room836-Temp							
Room836-tempSP							
Room836-radiator							
Room836-PIR							
Room836-LightSwitch							
End of Zone							
Zone5							
Room837-Temp							
Room837-tempSP							
Room837-PIR							
Room837-radiator							

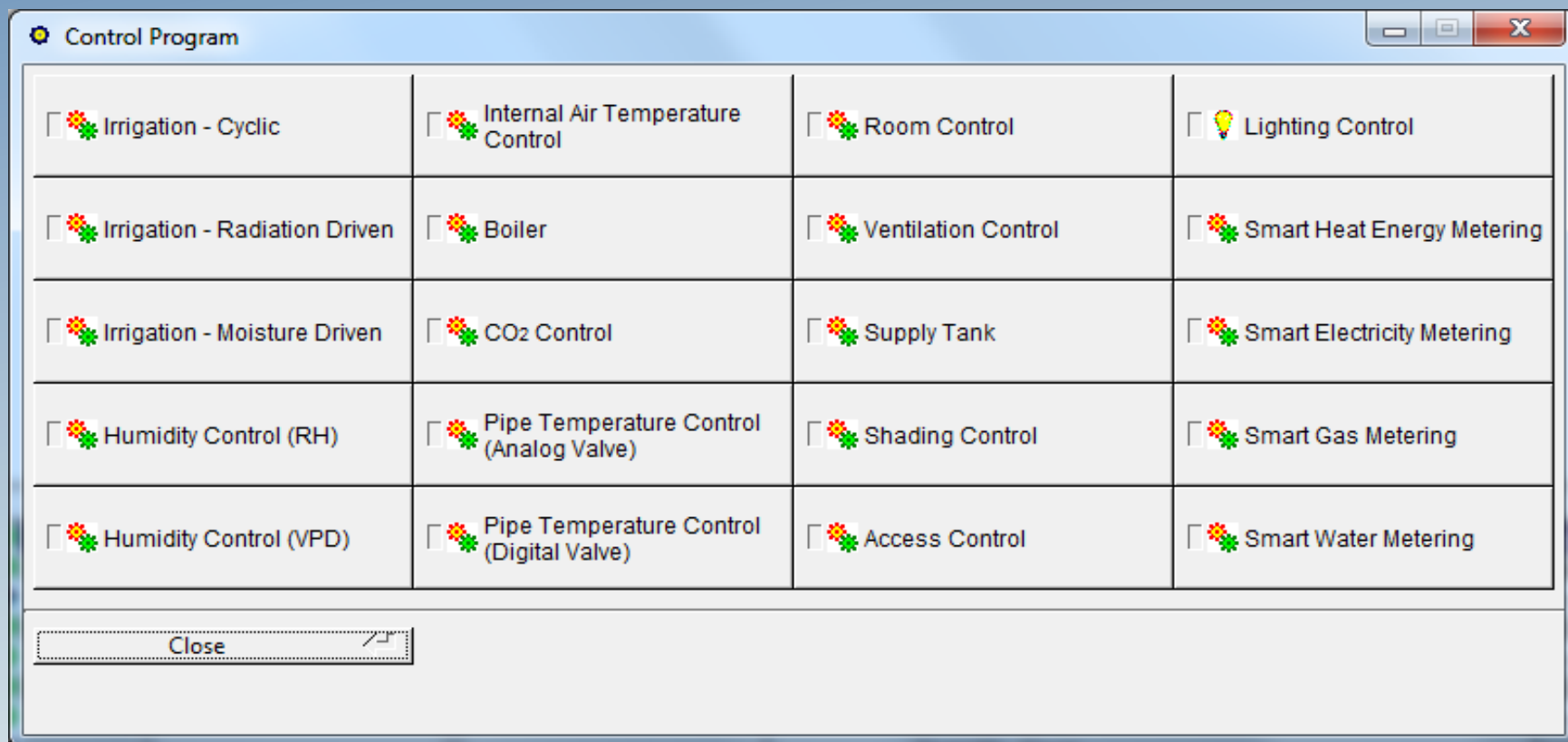
Zone	Address	Channel	Name	Channel Type	IO Type	Log	Current Value
1	10	1	Room833-Temp	Internal Air Temperature	Analogue Input	()	31.3°C
1	10	2	Room833-tempSP	Temperature Setpoint Sensor	Analogue Input	()	22.5°C
1	10	17	MainBlockFlowTemp	Pipe Temperature Sensor	Analogue Input	()	71.3°C
1	10	18	MainBlockReturnTemp	Pipe Temperature Sensor	Analogue Input	()	71.3°C
1	10	19	AuxBlockFlowTemp	Pipe Temperature Sensor	Analogue Input	()	71.3°C
1	10	20	AuxBlockReturnTemp	Pipe Temperature Sensor	Analogue Input	()	71.3°C
1	10	1	Room833-PIR	Presence (Zone)	Digital Input	()	On
1	10	10	MainBlk-Electricity	Electricity Meter (Zone)	Digital Input	()	On
1	10	1	Room833-radiator	Air Heating Valve	Analogue Output	()	0.000V
1	10	9	MainBlk-WaterMeter	Flow Meter (Zone)	Digital Input	()	On
1	10	11	AuxBlk-WaterMeter	Flow Meter (Zone)	Digital Input	()	On
1	10	1	Room833-LightSwitch	Light Switch	Digital Output	()	Off
2	10	3	Room834-Temp	Internal Air Temperature	Analogue Input	()	18.8°C
2	10	4	Room834-tempSP	Temperature Setpoint Sensor	Analogue Input	()	26.3°C
2	10	2	Room834-radiator	Air Heating Valve	Analogue Output	()	0.000V
2	10	2	Room834-PIR	Presence (Zone)	Digital Input	()	On
2	10	2	Room834-LightSwitch	Light Switch	Digital Output	()	Off
2	10	5	Room835-Temp	Internal Air Temperature	Analogue Input	()	12.5°C
3	10	6	Room835-tempSP	Temperature Setpoint Sensor	Analogue Input	()	20.6°C
3	10	3	Room835-PIR	Presence (Zone)	Digital Input	()	On
3	10	3	Room835-radiator	Air Heating Valve	Analogue Output	()	0.000V
3	10	3	Room835-LightSwitch	Light Switch	Digital Output	()	Off
4	10	8	Room836-Temp	Internal Air Temperature	Analogue Input	()	18.8°C
4	10	7	Room836-tempSP	Temperature Setpoint Sensor	Analogue Input	()	12.5°C
4	10	4	Room836-PIR	Presence (Zone)	Digital Input	()	On
4	10	4	Room836-radiator	Air Heating Valve	Analogue Output	()	0.000V
4	10	4	Room836-LightSwitch	Light Switch	Digital Output	()	Off

Date/Time	User	Details
2012/11/09 23:17:20	Aref@AREF-LAPTOP	Room-835 Logging On, bufferid=76, state=Yes
2012/11/09 23:17:20	Aref@AREF-LAPTOP	Room-835 Logging On, bufferid=76, state=Yes verified
2012/11/09 23:17:41	Aref@AREF-LAPTOP	Room-837 Logging On, bufferid=84, state=Yes
2012/11/09 23:17:41	Aref@AREF-LAPTOP	Room-837 Logging On, bufferid=84, state=Yes verified
2012/11/09 23:17:53	Aref@AREF-LAPTOP	Room833-radiator Logging On, bufferid=31, state=Yes
2012/11/09 23:17:54	Aref@AREF-LAPTOP	Room833-radiator Logging On, bufferid=31, state=Yes verified
2012/11/09 23:18:00	Aref@AREF-LAPTOP	MainBlockFlowTemp Logging On, bufferid=18, state=Yes
2012/11/09 23:18:00	Aref@AREF-LAPTOP	MainBlockFlowTemp Logging On, bufferid=18, state=Yes verified



- **Users can define set points such as temperature, humidity, CO2, light level etc. from a laptop**
- **No need to march up and down the corridor to keep lights on!**

- Satisfies the aims of an organisation
 - GCS is an all-in-one monitoring and control solution



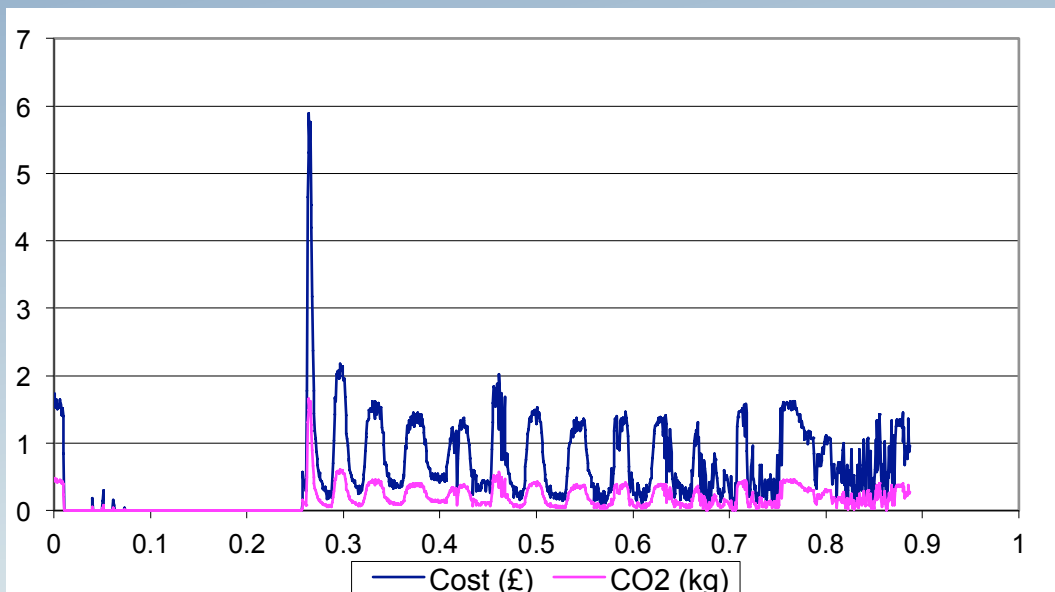
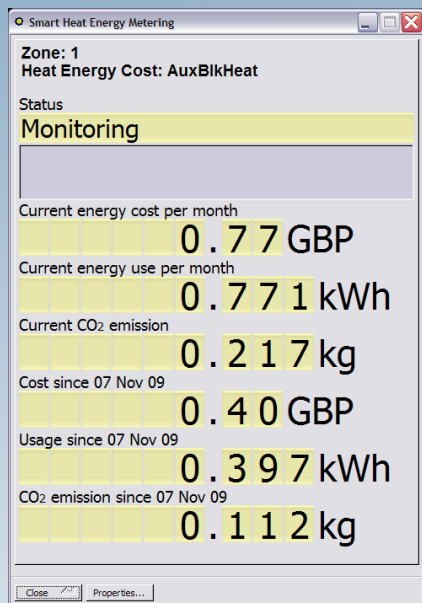
- Integrates seamlessly

The screenshot shows a configuration window titled "Pipe Temperature Sensor". It contains several input fields for sensor parameters:

Parameter	Value	Unit
Zone	1	
Address	11	
Channel	1	
Name	Pipe Temp	
Device type	Pipe Temperature Sensor	
Channel Type	Analogue Input	
Min Measurable	-50	°C
Max Measurable	200	°C
Min Generated Voltage	0	V
Max Generated Voltage	10	V
Log Sensitivity	1	°C
Engineering Unit	0.4	°C
Current Voltage	2.017	V
Device Pattern	033A	

At the bottom of the window, there is a "Logging" checkbox (unchecked), a "Modify" button with a pencil icon, and a "Cancel" button.

- **Bridges the control system to business database**
- **Remote operation and management through the Internet**
- **Data Security - sensitive data remains and analysed on-site**
- **No tie-up to any supplier as entire monitoring and analysis facility is owned by you**





- **Healthy in terms of well-being for the people living and working within it**
 - **Additional to heating, humidity, CO2 and light levels can be specified for each enclosure individually**
 - **Ventilation turns down as occupancy reduces**

➤ **Sustainable in terms of energy and water consumption**

- **Heating, Humidity and CO2 fresh air ventilation are demand-based not design-based**
- **Internal co-ordination of cooling and heating actions to avoid simultaneous (conflicting) operation**
- **Reporting methodologies are defined by user - sensors and actuators are directly tapped and logged locally**
- **For each enclosure GCS regulates the demand from the boiler**

- **Meets the long term aspirations of society maintaining minimal impact on the environment in terms of emissions and waste**
- **All-in-one for energy – Legislative requirements, Report generation, Analysis, Automatic energy optimisation**
- **Less resources used. Software based on Linux Open Source therefore flexible and easy to adapt with minimum effort**
- **Simple – non-specialists able to provide solutions**
- **Affordable – enables investment to reduce energy costs**
- **Simplicity is cornerstone of GCS – usable by the layman**

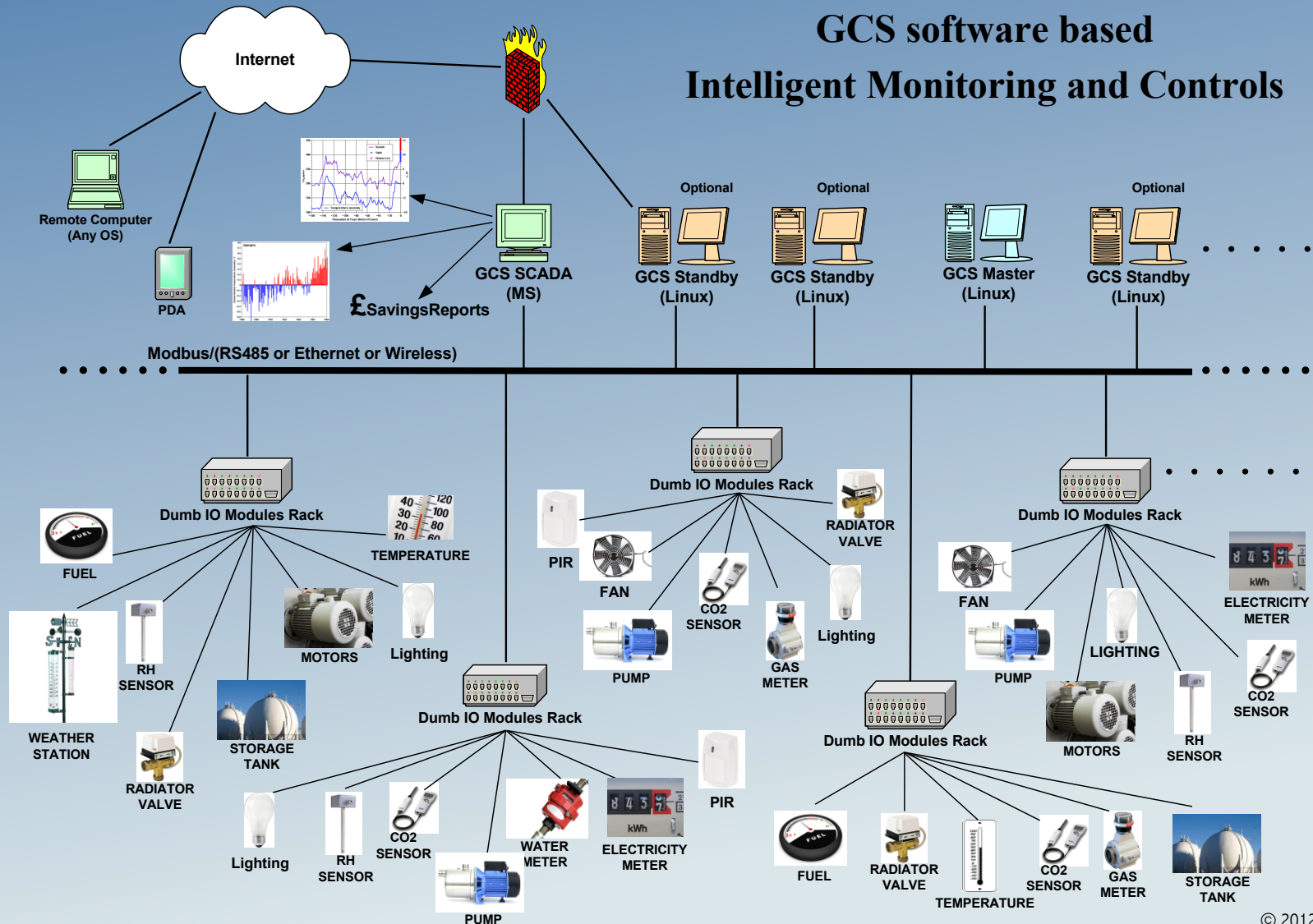




What Does This Mean Commercially?

- **A more pleasant built environment - providing a safe happy appealing place to be**
- **Better energy management = reduced costs, improved ROI**
- **More easily identified cost reductions**
- **Simpler maintenance - cheaper to install, cheaper to maintain and cheaper to update using off-the-shelf sensors/actuators and distributed IO**
- **Real-time data for business dashboard with user-define frequency**
- **Improved lean, nimble strategy, planning and innovation**
- **Corporate Social Responsibility (CSR)**
- **Support in selling more new business for your organisation**
- **Assists with competitive talent acquisition**

GCS software based Intelligent Monitoring and Controls





Any questions please?



GCS3000