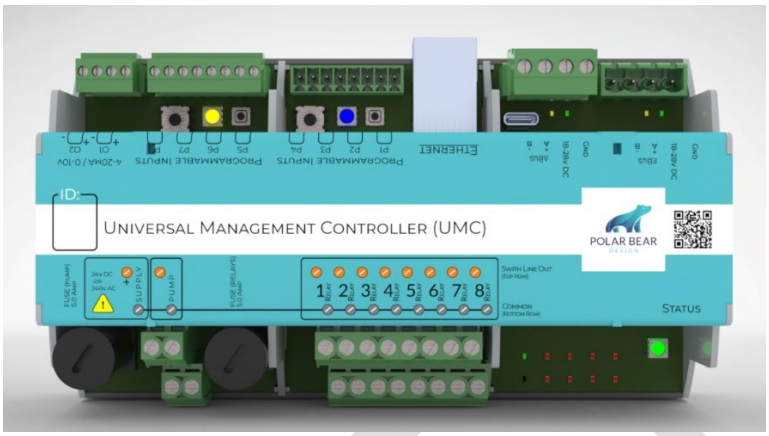
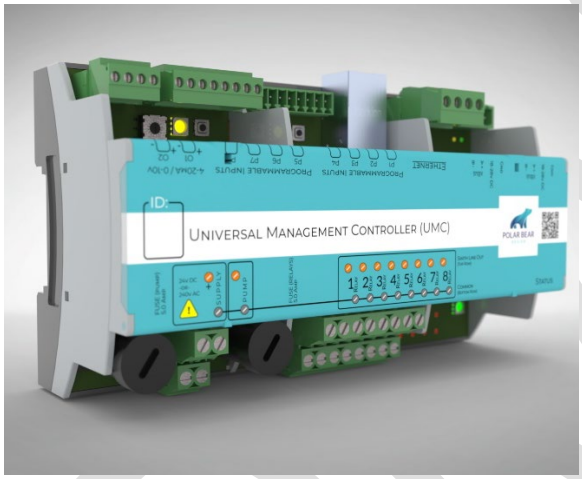
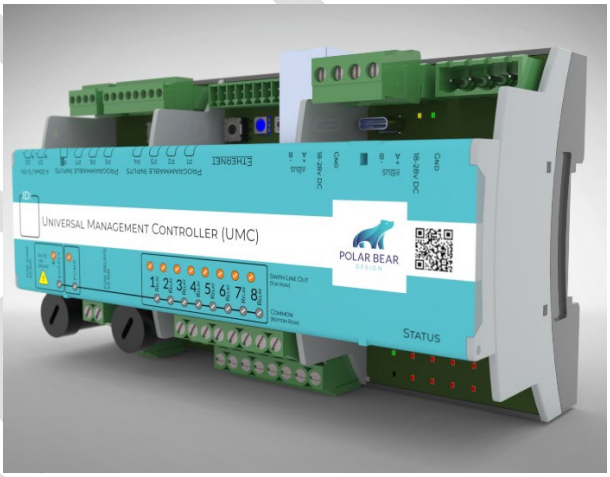
UMC Controller







The UMC is a controller is part of the Polar Bear Design HVAC control system and typically used with the Zentium room thermostats. The UMC is used to interface with services such as underfloor manifolds, electric mats, towel radiators and pumps / boiler demands. It can be used as a slave device, but also act as a master device ensuring a stand-alone system can run autonomously.

It can be integrated with Audio Video (AV) and Building Management Systems (BMS) controls. But can also be used as a stand alone controller to manage the Zentium thermostats

TECHNICAL FEATURES

- ARM Processor
- Compact DIN-mounted form factor with fused outputs to save space at tight UFH manifold locations.
- Support for underfloor heating manifolds with a local pump.
- Support for Radiators or Electric heaters.
- Support for Hot Water control
- Support for Heat Boost functions, such as trench heaters
- Master Mode, Mini Master Mode (MDUs) & Slave Mode
- Faceless Thermostat feature (* feature release Dec 24)

UMC Data Sheet

UMC Eight zone Heating controller

SPECIFICATIONS

Model Number	UMC2-ETH	UMC2-RS1
Programable I/O	UMC2-ETH 8no. Inputs (P1 – P8) programmed as Digital or Temperature P7 & P8 (additional feature) programmed 0-10v or 4-20mA Inputs 2no. Outputs (O1 – O2) programmed 0-10v or 4-20mA Outputs	UMC2-RS1 4no. Inputs (P1 – P4) programmed as Digital or Temperature
Temperature Sensors	Centigrade Supported Temperature Probes: NTC-10k3 or PT1000 With configurable resolutions of 0.1, °C Accuracy ±0.5°C ±1°F	
Relay Outputs	8no. Actuator / Zone Relay Outputs 240v AC / 24v DC @ 5A maximum total output – protected by fuse (5Amp) When controlling large electric loads e.g. underfloor mats. A suitably rated external electrical contractor MUST be used 1no. Pump Relay Output 240v AC / 24v DC @ 5A maximum output - protected by fuse (5Amp) Pumps / Motors controlled must have soft start. All Relays share a common supply No Mixed relay output types. Must be all AC or All DC or ALL Volt Free	
Power	IEC SELV/NEC® Class 2 Operating voltage: 20 – 28v DC 4.5 watts (excludes power for the actuators) PEEK absolute MAX is 6w @ 24vDC ~ 250mA @24v (excludes relays passthrough power)	
Typical Power	100mA @ 24v DC (2.4 watts) Test conditions: 50% Relays on, all features enabled, with external probes fitted	
Communications	UMC2-ETH 2x RS485 (pBus & aBus) 10/100 Ethernet Rj45	UMC2-RS1 1x RS485 (pBus)
	SELV/PELV/NEC® Class 2 wiring connects thermostats to other devices on the pBus and aBus link.	
	pBus (Polar Bear Bus) Byte Format: 8N1 Mode: Modbus RTU (Slave or Master)	aBus (accessories bus) Byte Format: 8N1 Mode: Modbus RTU (Master)
	Baud Rate: 9600, 19200, 38400, 57600 & 115200	
Terminals	pBus, aBus Terminals 22AWG to 12AWG wires I/O Power Terminals accepts 26AWG to 18AWG wires Relay Supply & Output Terminals 24AWG to 12AWG wires Bootlace Ferrules to be used on all stranded cabling	
Enclosure	The device MUST be mounted in a suitable enclosure according to the installation's requirements, using 35mm Standard DIN Rail mount. IP20 Rating, to be used indoors only.	
Environment	Ambient operating temperature: 0 °C to 40 °C, (32 °F to 104 °F) 0% to 80% non-condensing relative humidity. Indoor use only. Max Pollution Degree: 2	
ESD Protection	Meets IEC 801-2. To withstand 15 kV electrostatic discharge without damage or memory loss.	
Memory	Internal EEPROM is rated for 100,000 writes (non-volatile configuration only)	

Master Mode	pBus Master Device to communicate with other Polar Bear Design Products
Slave Mode	pBus Device slave address range 1 – 15
Sniffer	Modbus Sniffing mode to respond to other Polar Bear Design Products
Power Failure	Features marked as non-volatile are saved to internal EEPROM memory and will be restored after power is returned.
Warranty	https://www.polarbeardesign.co.uk/docs/warranty

Feature Summary

UMC MODES

Slave

When the UMC is running in slave mode all the IO and relays are available as control points to a higher-level control system. This system could be another UMC, Building Management System (BMS), Programable Logic Controller (PLC) or Audio Video (AV) control system.

Mini Master

The *Mini Master* mode is ideal for MDU installations or installations where fast self-configuration deployment is desirable. With a single UMC attached to Zentiums or Ursium thermostats on the pBus, it will scan for Devices and automatically program its own relay outputs and pump demand, based on the services configured in the Polar Bear Thermostats and if the zones are wet or electric or have towels heaters or other services enabled.

Max Master

The *Max Master* mode acts as a full master for larger stand-alone systems. When the polar bear design HVAC system has been configured a single UMC can then set to Max Master mode and it will manage communications of all the pre-configured Polar Bear Thermostats as well as other UMCs on the pBus Link.

PUMP OUTPUTS

The pump output is a relay that can either be triggered directly or automatically controlled depending on how the services are configured. A delay can also be attached to the pump output demand allowing the heating actuators time to fully open before triggering the demand on the pump / boiler. For example if a Zentium has the main zone configured as wet under floor and the 2nd zone (en-suite) configured to electric. The pump demand will only be activated when zone 1 has a heating demand.

REMOTE 10K3 & PT1000 SENSORS

The temperatures recorded by these are then presented on in the Modbus register tables. Each temperatrue input also has individual calibration capabilities.

DIGITAL INPUTS

The digital inputs are presented on the Modbus register tables. Some special features are pre-programmed into the unit depending on the UMC mode is running. e.g. in Mini Master mode for MDUs one digital input can automatically switch the Zentiums into different Operational Modes e.g. Auto, Heating Only, Cooling Only, Away.

UMC Data Sheet

PBUS SNIFFING

When used with the Zentium thermostat, the UMCs have the ability to sniff the data on the pBus link. This improves responses times significantly as the UMC will see a request and response to data on the network and react instantly. This means a higher-level control system does not have to interrupt priority communications which can cause unnecessary delays.

The UMC has the ability to sniff and automatically trigger services from the Zentium for:

- zn1 Heating
- zn1 Heat Boost
- zn1 Towel
- zn1 AC Heating
- zn1 Cooling
- zn1 Cool Boost

- zn2 Heating
- zn2 Heat Boost
- zn2 Towel
- zn2 AC Heating
- zn2 Cooling
- zn2 Cool Boost

- Dehumidifier Demand
- Humidifier Demand
- Hot Water

FAIL SAFE

When the UMC is sniffing the pBus link it will automatically recognises when a Zentium has gone offline. In this scenario the UMC will automatically fail SAFE (after a failsafe period timer) and turn OFF any demands that may have previously been generated by that Zentium.

PROCESSOR RECOVERY

Every UMC has the capacity to become the main Master processor. When the UMC is a master it has the responsibility for generating traffic and ensuring the system operates. Therefor if any UMC goes down, a BMS processor removed or higher level control system failure, any UMC can be set to become the master to keep the installation running.

MDU MINI MASTER MODE

The UMC has a unique mode designed specifically for small rapid deployment projects where only a single UMC is required, with a few Zentium thermostats.

The UMC operates in a MINI Master Mode. In this mode the UMC will search for Zentium Thermostats on the pbus and the automatically configure itself based on the configuration within each Zentium it finds.

EXAMPLE

Consider 5no. Zentium's wired together on the same bus as a UMC. These Zentium's have been pre-configured configured as follows.

- Zentium ID 11 = Zone 1 ENABLED, Z1 Towel DISABLED, Zone 2 DISABLED, Z2 Towel DISABLED
- Zentium ID 12 = Zone 1 ENABLED, Z1 Towel DISABLED, Zone 2 DISABLED, Z2 Towel DISABLED
- Zentium ID 13 = Zone 1 ENABLED, Z1 Towel DISABLED, Zone 2 ENABLED, Z2 Towel DISABLED
- Zentium ID 14 = Zone 1 ENABLED, Z1 Towel DISABLED, Zone 2 ENABLED, Z2 Towel ENABLED
- Zentium ID 15 = Zone 1 ENABLED, Z1 Towel DISABLED, Zone 2 ENABLED, Z2 Towel ENABLED

When the UMC SCANs the bus to find the installed Zentium's and then automatically configure itself using a pre-formatted method. For the above the following configurations will be saved on the UMC. The priority is given to the lowest address ID it finds and then in priority of services on Zone 1 then Zone 2. Therefore:

- output 1: Zentium ID 11 Zone 1 HEATING
- output 2: Zentium ID 12 Zone 1 HEATING
- output 3: Zentium ID 13 Zone 1 HEATING
- output 4: Zentium ID 13 Zone 2 HEATING
- output 5: Zentium ID 14 Zone 1 HEATING
- output 6: Zentium ID 14 Zone 2 HEATING
- output 7: Zentium ID 14 Zone 2 TOWEL
- output 8: Zentium ID 15 Zone 1 HEATING
- output N/A: Zentium ID 15 Zone 2 HEATING
- output N/A: Zentium ID 15 Zone 2 TOWEL

When the UMC is in Master Mode the following features can also be used.

OPERATIONAL MODES (MDU MODE)

The UMC has four digital inputs. When the UMC is configured to MINI Master Mode for MDUs, then input 1 on the digital input can be used to put all the found Zentiums into different Operational Modes.

- AWAY Mode: Pulse 2 to 4 seconds
- HeatOnly Mode: Pulse 4 to 6 seconds
- CoolOnly Mode: Pulse 6 to 8 seconds
- AUTO Mode: Pulse 0 to 2 seconds -OR- 8 seconds and above

Further customisation is avaible for these digital inputs

FULL MASTER MODE

On larger instalaltions where multiple UMCs and Zentium are used any of the UMCs can be nominated as a Mater processor. When in this mode it can scan the bus and registers all the zentiums on the netowrk before proceeding to then manage the networks comunications.

This allows the Polar Bear Design HVAC control system to operate completely autonmasly from AV or BMS control systems.

TEST MODES

The UMC has a number of different test modes to allow you to check wiring before completing the installation and programming. These test mode are controlled by the Feature dial.

C Fast scroll through each actuator and pump output turning them on and off

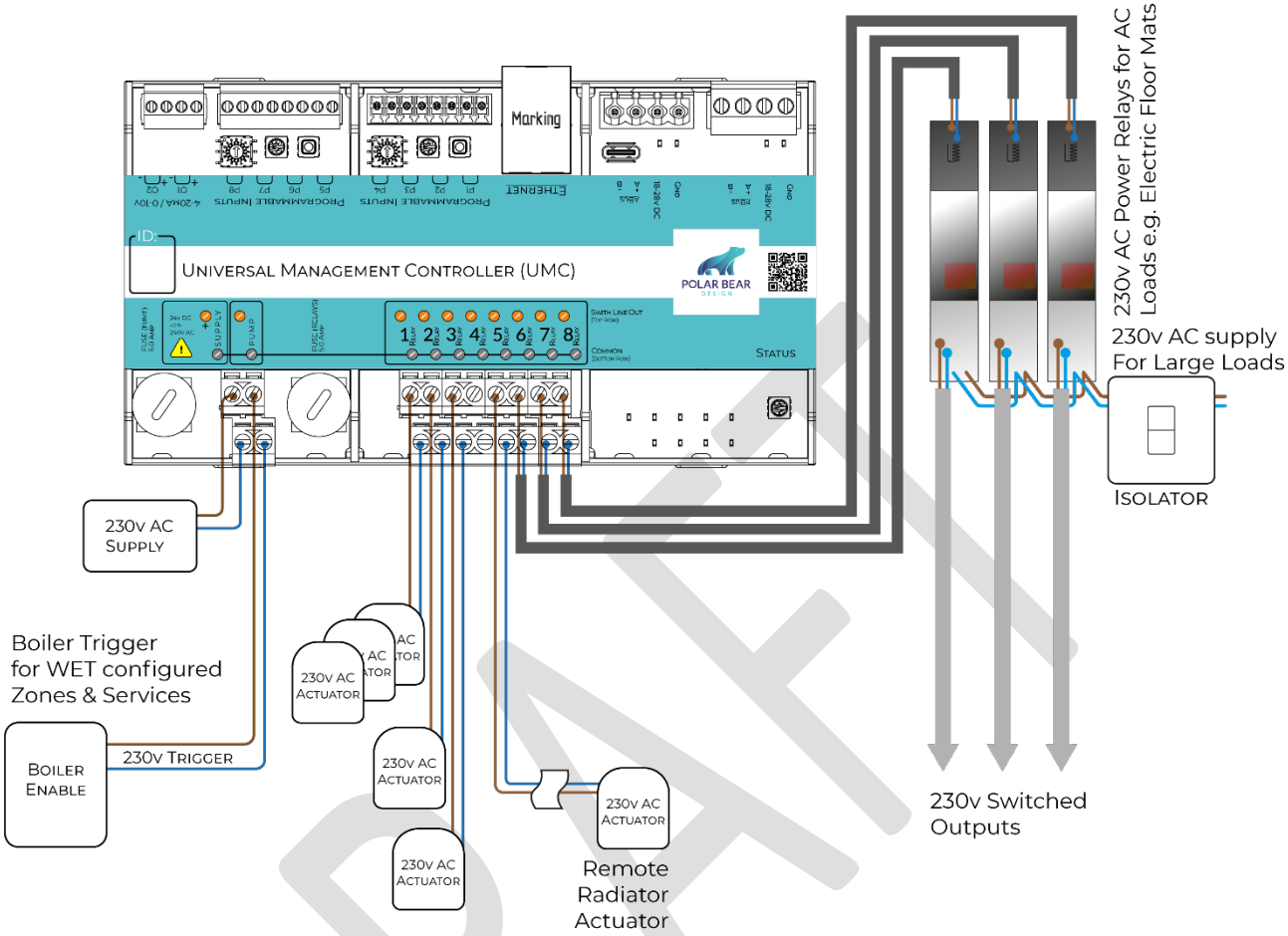
D Scroll through each actuator and pump output turning them on and off

E Turns ON ALL Actuators & Turn OFF PUMP

F Turns ON ALL Actuators & Turn ON PUMP

UMC Data Sheet

Wiring Diagrams



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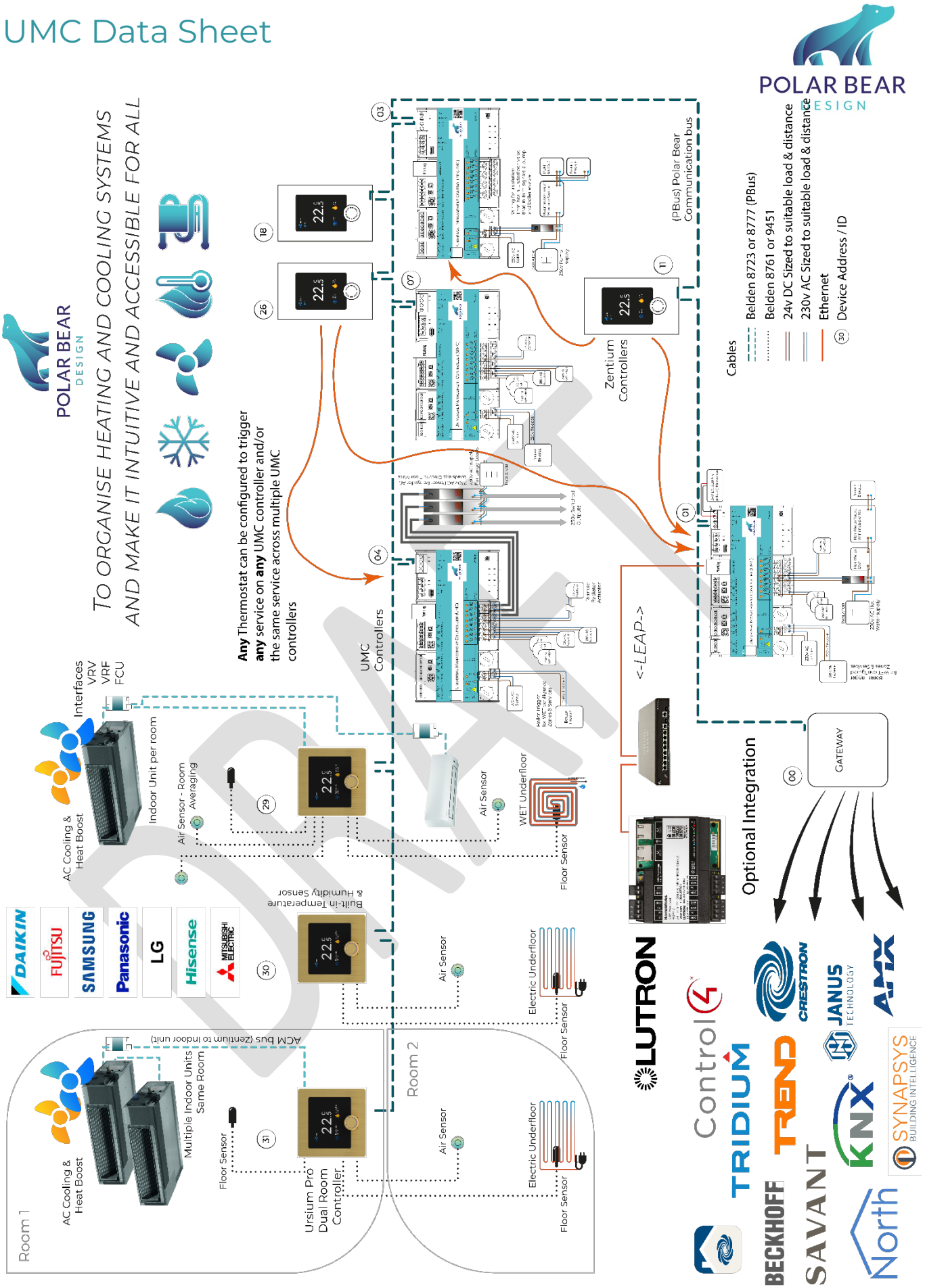

UMC Data Sheet

Dimensions