MF820 TECHNICAL SPECIFICATION

The MF820 is a micro-processor based controller capable of operating standalone or as part of a network. All BMS features of energy management, control, data logging, alarm/event monitoring and remote communications are resident within the MF820.

The MF820 is freely programmable with pre-engineered blocks for standard applications accessed from a series of menus. Programming can be directly from its built-in keypad & display or from a local or remote PC via either of the RS232 ports.

Hardware Configuration

Minimum hardware configuration consists of the following:

1 - MF820 - Master Control Unit (MCU) with User Display, Adjust and Override Facilities

1 - LDCX4 - Input/Output (I/O) Module

The system can be expanded up to a further three I/O modules (LDCX4) via the RS485 expansion bus. An MF820 - R Repeater Control Unit can be added also, this unit comes with a user display, adjust and override facilities.

MF820 System Inputs and Outputs

MF820 System Inputs and Outputs are available at the following:

- **MF820 Master Control Unit (MCU)**

  No field connected I/O's but MF820 MCU has 4 built-in dedicated PB inputs acting as:

  - Extension timers for heating, hot water etc.
  - Override switch for Summer/Winter and Holiday/Auto selection

- **LDCX4 I/O Module**

  This has inputs and outputs for the following field connections:

  8 - **Analog Inputs** for Ambiflex sensors or other sensors providing linear 0…10V or 4…20mA signals
  8 - **Digital Inputs** for volt free contact monitoring, special overrides, utility metering etc.
  8 - **Digital Output Relays** with single pole changeover contacts. Contacts/track rated 8/10 amp, 230V ac resistive
  4 - **Analog Outputs** providing a linear 0…10V signal :-

Physical Characteristics

The MF820 board incorporates all electronics, LCD display, keypad, engineers 9 pin RS232 port connection for a laptop/PC and 25 pin, RS232 port connection for a modem. The LDCX4 comprises of a board incorporating output relays and two-part, 2.5mm² pluggable terminals. The two boards are linked by the RS485 bus.

Dimensions

MF820	250mm x 150mm x 60mm approx.
LDCX4	204mm x 142mm x 45mm approx.

N.B. Where a modem is plugged into the MF820 a minimum of 125mm must be allowed above the top edge of the MCU card.

Power Supplies

MF820 MCU	230/240V, 50Hz, 10VA
LDCX4 I/O Module	24V, 50Hz, 6VA

The on-board RAM memory is backed up with a built-in Lithium battery. This gives support for operation of the clock and data retention, with the mains supply off, for a total of approx. 3 years or up to 10 years data retention only if the clock is turned off.

Field Wiring

Field wiring is as follows:

RS485 Bus between I/O modules	3 core screened cable
Analog Inputs	2 core screened cable
Digital Inputs	2 core screened cable
Analog Inputs	2 core screened cable
Digital Outputs	to controlled devices, e.g. motor starter, boilers, control valves etc. to comply with IEE or other governing body regulations.
RS485 Bus between MCU and I/O modules	3 core screened cable

Access

In addition to the ‘User’ facilities available in the open access mode, i.e. while the MF620 remains ‘locked’, there are three levels of access via the keypad, each with its own user programmable, six digit PIN number:

Low Level	limited access to revise time schedules
Mid Level	access to operational settings and some control adjustments
High Level	access to all settings except master level PIN

Energy Management

Integrated system control is central to Energy Management within the MF820.

12 - Independent 7 day time channels **each** providing:

- independent daily start/stop time control
- independent daily Optimum start/stop time control
- independent daily proportional load cycling time control
- independent daily temperature limit switch time override control

Each time channel also supports high/low limit switching, automatic economy functions, calendar scheduling and BST/GMT changeover.

24 Limit Switches for frost settings, automatic economy functions, room high/low limit etc.

Control

The MF820 features the following control functions:

40 Setpoint Generators for weather compensation, room reset, cascade control etc.

24 User Setpoint Adjustment with programmable maximum, minimum and reset mode.

96 Programmable Logic Nodes incorporating inputs with AND, OR, NOT-AND and NOT-OR statements. On and off delay timers and latching conditions can be set. Real and calculated analog points may also be incorporated. (maximum inputs = 254)

16 P + I Control Output Loops for control of boiler sequencing, modulating valves, dampers, etc.

Loops are shared via on board relays and 0 … 10V onboard outputs

The Loops via on board relays feature pre-engineered blocks for boiler sequencing and Velocity Module Incremental control (VMI – the speed of the regulating device is proportional to the deviation from setpoint) of modulating valves/dampers.

Boiler sequencing control of up to 4 boilers on loops 1 &2 incorporates equalised run time (ERT) of boiler modules and variable minimum off time (VMOT), i.e. the off time between stages is varied proportionally to the differential between the calculated boiler target temperature and the measured boiler return temperature.

More than 4 boilers could be controlled either by using both loops 1 & 2 interlocked with the alternating duty/auto changeover facility or by utilising one of the 0…10V analog outputs to control a sequencer module, such as the Ambiflex NSQ 8023.

The Loops via 0 … 10V on board outputs feature pre-engineered blocks for modulating valve and damper actuators, motor drive speed control and Ambiflex multi stage sequencer controllers.

Comprehensive PLC type interlocking/control logic of all outputs.

Monitoring

6 Independent Data logs

Energy Log	accumulative meter readings & degree day values 1 log at daily intervals (32 samples) 1 log of 13 monthly samples
5 Performance Logs	8 actual or calculated temperature values, 250 samples, 1 min / 2 min / 5 min / 15 min / ½ hour / 1 hour / 2 hour logging intervals can be used

Event and Alarm Recording

Automatically records alarms and specified events set up in the Logic Nodes; 45 events are stored on the event list within the controller. If more than 45 events are recorded then in general the oldest records will be displaced to make way for new events.

Network Expansion and other Communications Facilities

These include:

1 - 25 pin D connector from RS232 comms port for connection to:

- Local high level site network supporting other MF820 systems
- PSTN with modem connected directly to PSTN line
- PSTN with modem sharing a PSTN line with other telephone(s)
- PSTN with modem providing direct dial-out to any fax machine on the PSTN

1 - 9 pin D connector on the front panel from a second RS232 port for connection to a local PC supervisor.

On sites where networking and data sharing is required up to 32 MF620 and MF820 controllers can be connected together.

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