



# MN550

## Programmable Controllers

The Satchwell MicroNet MN550 Controllers are fully programmable controllers designed for district heating, boiler plant, air handling unit (AHU) and zone heating and cooling applications. These controllers feature plug-in field wiring terminal blocks, universal inputs, built-in line voltage relays, analogue outputs, pulse counting inputs and support for one MicroNet MN-Sx sensor.

MN550 controllers use fully-programmable control sequences based on a set of control objects residing in controller memory. The controllers can function in stand-alone mode (after programming with the VisiSat Configuration Tool) or as part of a Native Communications Protocol (NCP) or ARCNET® communications network.

An optional Real Time Clock Card (RTC) can be fitted to all variants of the MN550 to maintain the controller’s time during a power failure.

A Touch Screen Display option allows the user to view, query and edit controller properties. In addition, an LCD display can be connected (or fitted) to the controller to enable overrides and reviewing of the controller’s parameters.

### FEATURES

- ARCNET and NCP communications options (optically isolated)
- Fully programmable using graphical objects
- 24Vac or 24Vdc input power supply
- Time schedules for plant and controller switching
- 15Vdc supply output for humidity, pressure sensors, etc.
- S-Link sensor connectivity
- Ten fully configurable inputs - digital, analogue 0-10Vdc, resistive 0-10kΩ
- Optional battery-backed Real Time Clock (RTC) available for use on both networks or for stand-alone operation
- Capacitor-backed RAM (up to 1 week)
- LED diagnostics
- Proportional, integral and derivative control actions can be individually set in controller applications
- Optimisation module
- Optional LCD Display for interrogation of local parameters
- Intelligent multi-loop controller - up to 12 PID control loops
- Four analogue (0-10Vdc) outputs
- Six built-in line voltage relays, 230Vac 5A resistive
- Two inputs specially designed for pulse counting
- Suitable for applications such as district heating, boiler and air handling units
- Plug-in field wiring terminal blocks
- Wall or DIN rail mounting

### APPLICATIONS

Suitable for new or existing system installations, the MicroNet MN550 Controllers provide control for the following types of applications:

- Boiler Compensation and separate Hot Water Supply (HWS) system
- District Heating Sub-Station Control
- Boiler Sequence Control with a separate HWS system
- Full air conditioning including fan sequence control
- Zone heating and cooling systems

### CONNECTIVITY

The MN550 Controllers can be attached directly to an MN-Sx Sensor allowing a user to monitor controller performance and edit operational values.

When used on an NCP or ARCNET communications network, MN550 controllers connect to a PC running VisiSat Configuration Tool and MicroNet View/VisiView software, either directly using an ARCNET PC card or via the appropriate MicroNet Manager Interface (MN50-MI-NCP or MN50-MI-ARC).

### PART NUMBERS

MicroNet 550 ARCNET Controller . . . . .	MN550-ARC
MicroNet 550 NCP Controller . . . . .	MN550-NCP
MicroNet 550 Dual NCP Controller . . . . .	MN550-XCOM

## TECHNICAL DATA

Supply voltage. . . . . 24Vac, 50/60Hz (supplied from a transformer conforming to EN 61558), or 24Vdc.  
 Max. power consumption . . . . . 12VA @ 24Vac, 6.5W @ 24Vdc  
 Fuse. . . . . 1A anti-surge

### Ambient Temperature

Shipping and Storage. . . . . -20°C to +70°C  
 Operating . . . . . 0°C to +50°C (when fitted with a plug-in Touch Screen Display, operating temperature is 0°C to 40°C).

### Humidity

Operating and Storage . . . . . 0 to 95% RH, non-condensing

### Mechanical

Enclosure. . . . . Moulded ABS plastic case  
 Flammability class . . . . . UL 94 V-0  
 Protection class . . . . . IP 20  
 Dimensions & Weight . . . . . see Fig. 3  
 Mounting . . . . . Wall or 35mm DIN rail. On or in a control appliance  
 Wiring Terminals:. . . . . Pluggable screw terminal blocks (low voltage only). Max. conductor size 1.5mm<sup>2</sup>.

### Real Time Clock Module (optional)

Accuracy at +25 °C . . . . . ±10 minutes per year  
 Battery. . . . . Lithium, 3V, 125mAh. Battery life 5 years minimum

### Communications

NCP. . . . . 9.6k baud, RS 485  
 ARCNET . . . . . 156k baud, RS 485

### Agency Compliances

Emission . . . . . EN 61326 (Emissions) Class A  
 . . . . . EN 61326 (Immunity) Class AB  
 LVD Compliance:. . . . . EN 60950 2001 (Safety IT)  
 . . . . . EN 60730-1 2001 (Safety) (pollution degree 2)  
 UL Listing:. . . . . UL916  
 . . . . . Canadian Safety Standards FCC Class A

### Power Failure Reserve

Controller EEPROM preserves memory for 10 years under normal conditions of use. RAM contents will be preserved for up to one week in the event of a mains power failure, by a back-up capacitor. The software clock will stop during a power failure. If the controller has an RTC card, then the time will be maintained.

## INPUTS AND OUTPUTS

I/O Point Type	Description	Quantity
Universal Input (UI)	Each separately jumper configurable for either resistive (0-10KΩ, 0 - 10Vdc or digital use).	10
Pulse Counting Input	Dry contact, each capable of counting up to 10 pulses per second. Note: the actual speed depends on the application time cycle time, i.e. how often the pulse input signal is passed to a counter module. Typically this is 2Hz or less.	2
Analogue Output (AO)	0 - 10Vdc (at 1mA) for analogue actuator or transducer control (10KΩ minimum input load).	4
Relay output	Line Relay Outputs, 5A resistive, Type 1B. Current Rating: 5A at 230Vac. See wiring cautions on back page.	6
Sensor Link	Sensor Link for MicroNet S-Link sensor. Input comprises: Space Temperature (0°C to 50°C); Adjustable Setpoints (4.4°C to 35°C); Operational Mode (Heat/Cool/Auto/Off); Fan (On/Speed (Low/Medium/High)/Auto); Override Pushbutton (standalone occupancy control or remote status monitoring of local status condition). These features are programmable in VisiSat.	1
15Vdc Output	15Vdc (25mA) supply output for humidity and pressure sensors etc.	1

## ACCESSORIES

LIB-4-485 . . . . . RS 232/RS 485 Converter to connect PC to NCP network  
 PCI20-485 or PCI20U-485 . . . . . PCI card\* to connect PC to ARCNET network. Type depends on PC's motherboard.  
 PCM20H-485 . . . . . PCMCIA card\* to connect Laptop to ARCNET network.  
 . . . . . \*PCI and PCMCIA cards available from Contemporary Controls ([www.ccontrols.com](http://www.ccontrols.com)).  
 MN-DK . . . . . Display Wall Mounting Kit for LCD/Touch Screen  
 MN50-LCD . . . . . MicroNet LCD Display  
 MN50-LCDP . . . . . MicroNet LCD Display (for panel mounting)  
 MN50-MI-ARC . . . . . MicroNet Manager Interface for ARCNET networks  
 MN50-MI-NCP . . . . . MicroNet Manager Interface for NCP networks  
 MN50-MI-RTR . . . . . ARCNET Router  
 MN50-RTC . . . . . Real Time Clock Card for MN Series Controllers  
 MN-TK . . . . . Trunking Mounting Kit  
 MN50-TS-100 . . . . . MicroNet Touch NCP Screen Display (for wall mounting)  
 MN50-TSP-100 . . . . . MicroNet Touch NCP Screen Display (for panel mounting)  
 MN-VSCORE. . . . . VisiSat Configuration Tool (requires Visio 2003 software), core software (NCP & ARCNET).  
 CSM-CORE. . . . . Configuration, Service and Maintenance Tool

## TYPICAL SYSTEM DIAGRAM

### MICRONET MN550 CONTROLLER

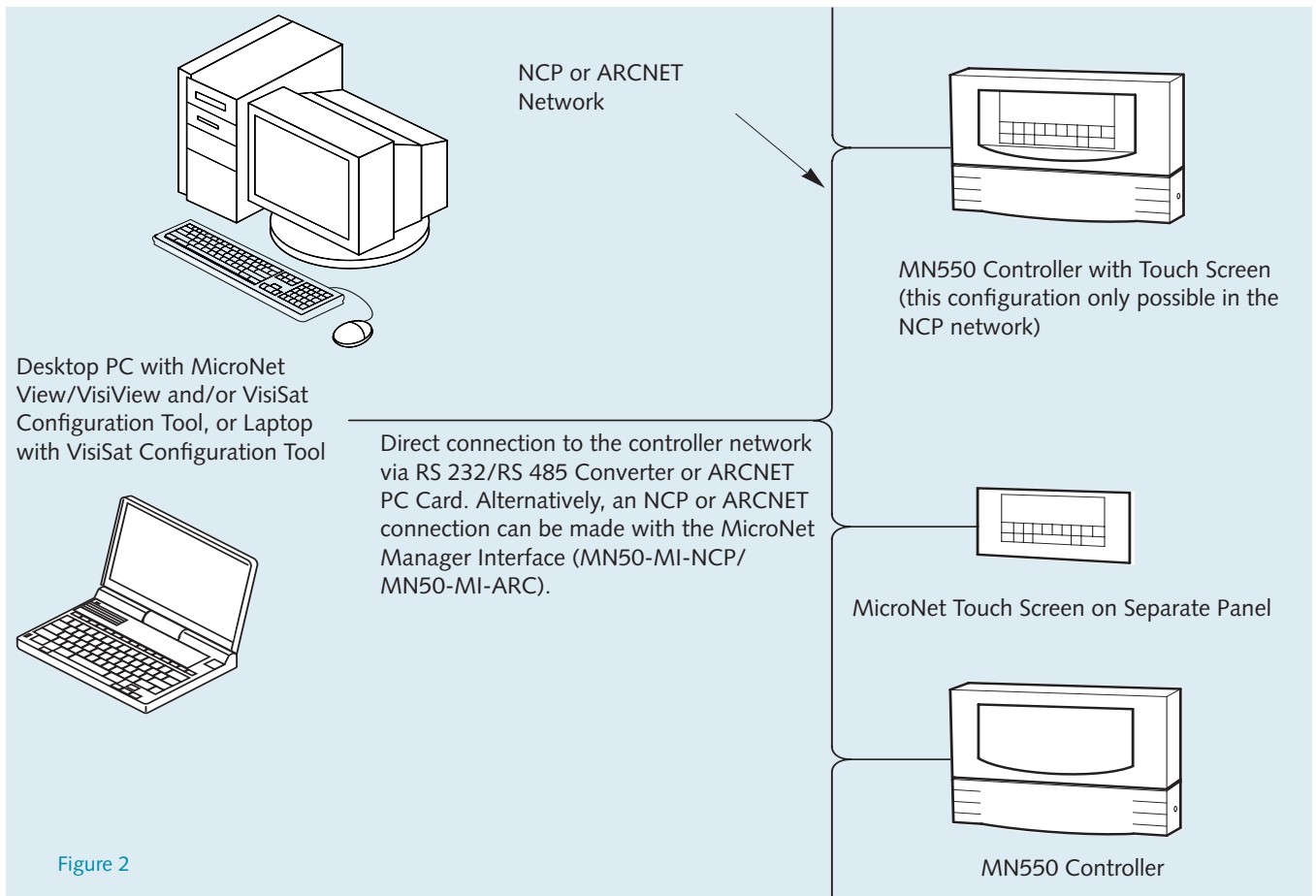


Figure 2

## COMMUNICATIONS

### ARCNET

If an open communications standard is not necessary, but peer-to-peer communications is required, the high-performance ARCNET network option may be implemented. This network is created by using ARCNET controllers (e.g. MN550-ARC) and a MicroNet Manager Interface (MN50-MI-ARC).

An ARCNET communications network can host up to 95 devices per sub-LAN (and up to 31 sub-LANs using ARCNET Routers). ARCNET controllers communicate with each other in a peer-to-peer mode and connect to the MicroNet View software via an MN50-MI-ARC only and with the VisiSat Configuration Tool/VisiView software via an MN50-MI-ARC or an ARCNET PC card.

An ARCNET network has a communications speed of 156k baud.

An optional MicroNet Touch Screen Display can be mounted on a self-contained panel and connected to the MN550-ARC variant.

An optional LCD Display, when mounted remotely, can be connected to an MN550-ARC controller operating in stand-alone mode. In addition, the LCD can be connected to an MN550-ARC variant in an ARCNET network.

The LCD can be also be mounted directly

on an MN550-ARC controller in stand-alone mode (using a ribbon cable).

### NCP (Native Communications Protocol)

In cases where an open communications standard is not required, an NCP network can be used. An NCP network can host up to 20 sub-networks with 63 devices each communicating in a polled-response mode.

Controllers on an NCP network (e.g. MN550-NCP) connect to MicroNet View/VisiView and the VisiSat Configuration Tool via a direct connection to the PC using an RS 232/RS 485 Converter. Alternatively, connection can be via a MicroNet Manager Interface (MN50-MI-NCP).

An NCP network has a communications speed of 9.6k baud.

An optional MicroNet Touch Screen Display can be mounted directly on the controller or on a self-contained panel.

An optional LCD Display, when mounted remotely, can be connected to an MN550-NCP controller operating in stand-alone mode. In addition, the LCD can be connected to an MN550-XCOM variant in an NCP network.

The LCD can be also be mounted directly on any MN550-NCP controller in stand-alone mode (using a ribbon cable).

### S-Link Sensor

A Sensor Link (S-Link) (two-wire, unshielded, communications wiring) provides a power and communication interface to an MicroNet (MN-Sx) series sensor. From some MN-Sx models, the user can view and adjust application parameters. A maximum of 61m is allowed between the MN550 controller and the MicroNet Sensor.

### DOCUMENTATION

- MN550 Wiring & Commissioning - DS 10.153A
- MN550 Installation Instructions - MLI 10.153
- MicroNet Manager Interface - DS 10.217
- MicroNet MN-Sx Sensors - DS 10.000
- MicroNet Touch Screen - DS 10.050
- MicroNet LCD Display - DS 10.060
- MicroNet View - DS 10.201
- VisiSat Configuration Tool - DS 10.202
- VisiSat Engineering Guide
- MicroNet System Overview
- MicroNet System Engineering Guide
- CSM Tool - DS 10.203.

## DIMENSIONS

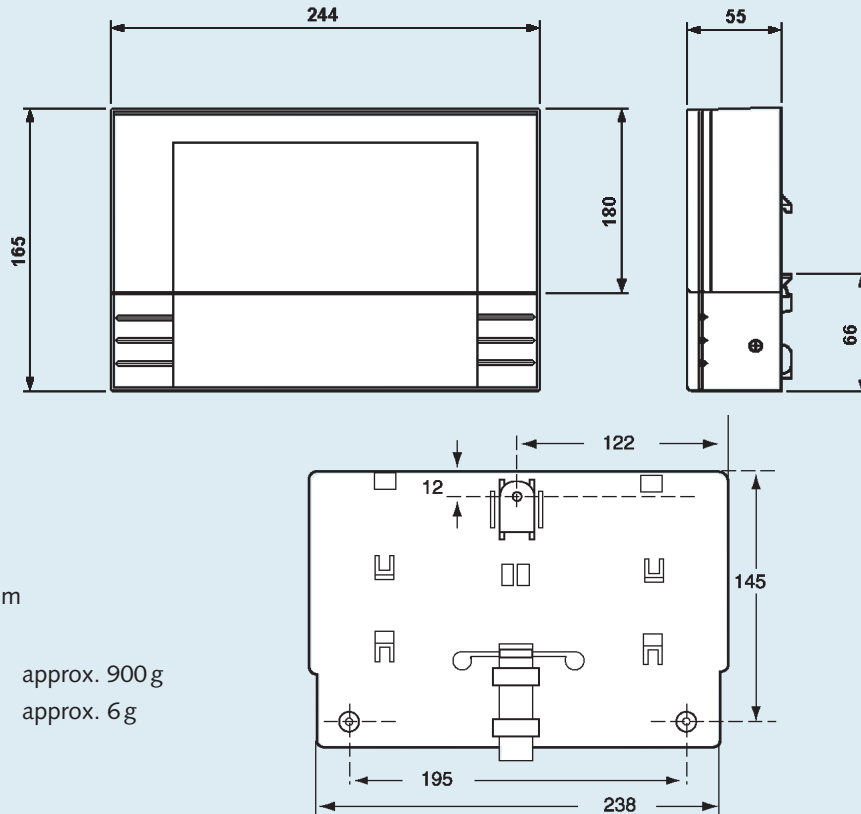


Figure 3

## WARNINGS

1. THIS DEVICE OPERATES FROM 24Vac or 24Vdc. DO NOT EXCEED RATED VOLTAGE. LOCAL WIRING REGULATIONS AND USUAL SAFETY PRECAUTIONS APPLY.
2. ELECTRICAL SHOCK HAZARD. REMOVE ALL POWER FROM BOTH THE CONTROLLER AND RELAY OUTPUTS BEFORE MAKING TERMINATIONS OR CHANGING CONFIGURATION INPUT JUMPERS.
3. RELAY OUTPUTS COULD BE AT MAINS POTENTIAL.

## Cautions

- Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.
- If any equipment covers have to be removed during the installation of this equipment, ensure that they are refitted after installation to comply with UL and CE safety requirements.
- 24Vac must be supplied by a transformer conforming to EN 61558.
- Do not exceed the maximum ambient temperature.
- Interference with parts under sealed covers invalidates guarantee.
- Do not charge, short-circuit or solder the MN50-RTC battery. Do not allow contact with water, nor heat, disassemble or dispose of in fire. Do not reverse polarity in application.
- Do not route relay output wiring with any other controller wiring.
- Do not route power and output wiring with signal wiring.
- Do not run Extra Low Voltage (24Vac or less) wiring in the same harness as mains wiring.
- The design and performance of TAC Satchwell equipment is subject to improvement and therefore liable to alteration without notice.
- Information is given for guidance only and TAC Satchwell does not accept responsibility for the selection or installation of its products unless information is given by the company in writing relating to a specific application.
- A periodic check of the Building Management System is recommended. Please contact your local sales office for details.
- All installation wiring must conform to BS 6701:2004 & EN 50174.

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