Satchwell

# MN 500

## I/A SERIES® MICRONET MN 500 CONTROLLERS

Order Type:
MNN-50-100 - MicroNet NCP 500 Series Controller

The I/A Series MN 500 Controllers are fully programmable controllers designed for district heating, boiler plant, air handling unit (AHU) and zone heating and cooling applications. These controllers feature field wiring terminal blocks, built-in line voltage relays, ten universal inputs, two pulse counting inputs and three analogue outputs capable of providing up to six control loops. (The 15Vdc supply can be configured as a fourth analogue output.) I/A Series MN 500 controllers use fully-programmable control sequences based on a set of control objects residing in controller memory. The controllers can function in standalone mode (after programming with the VisiSat Configuration Tool) or as part of a LONWORKS® FTT-10 Free Topology, a Native Communications Protocol (NCP) or ARCNET® communications network. An optional Real Time Clock Card (RTC) can be fitted to the MN 500 on an NCP network. Other options include a remote mounting Touch Screen Display which allows the user to view, query and edit controller properties. An LCD display option is also available to review the controller parameters locally.




## FEATURES

- **LONWORKS FTT-10, ARCNET and NCP communications options**
- **Fully programmable using graphical objects**
- **Intelligent multi-loop controller–up to 8 PID control loops**
- **Optimization module**
- **Time schedules for plant and controller switching**
- **Proportional, integral and derivative control actions can be individually set in controller applications**
- **Wall or DIN rail mounting**
- **15Vdc supply output for humidity, pressure sensors, etc.**
- **Ten fully configurable inputs - digital, analogue 0-10V, resistive 0-10kΩ**
- **Six built-in line voltage relays, 230Vac 5A resistive**
- **Two inputs specially designed for pulse counting**
- **Optional LCD Display for interrogation of local parameters**
- **Suitable for applications such as district heating, boiler and air handling units**
- **Optional Real Time clock (RTC) available for use on an NCP network or for stand-alone operation**

**Data Sheets**
DS 10.050 - Touch Screen
DS 10.103A - Wiring and Commissioning Information
DS 10.201 - MicroNet View Software
DS 10.202 - VisiSat Configuration Tool
DS 10.210 - MicroNet Manager Interface

**Multi-Lingual Instructions**
MLI 10.103 - Installation Instructions

## SPECIFICATIONS

| Order Type | Description | Communications Protocol | Real Time Clock Available |
|---|---|---|---|
| MNN-50-100 | MicroNet NCP Programmable Controller | NCP[a,b] | Yes, with RTC Card[c] |

a ARCNET communications protocol available for this model with optional ARCNET plug-in card.
b LonWorks communications available with optional LonWorks plug-in card.
c The RTC Card cannot be fitted to controllers on an ARCNET or LonWorks network.

## HARDWARE SPECIFICATIONS

**Dimensions:** 244mm width x 165mm height x 55mm depth.

**Enclosure:** Moulded Polycarbonate plastic case.
IP 40

**Power Supply Input:** 24Vac, 50/60Hz supplied from a transformer conforming to EN 60742.

**Maximum Power Consumption:**
**MNN-50-100:** 12VA
**MNN-50-100 with MNN-RTC:** 13VA
**MNN-50-100 with MNA-C:** 13VA
**MNN-50-100 with MNL-C:** 15VA
**MNN-50-100 with MNN-COM:** 15VA

**Fuse:** 2A (anti-surge)

**LVD Compliance:** EN60730-1 (Safety)

**Mounting:** Wall or 35mm DIN rail.

**Ambient Limits:**
**Operating Temperature:** 0 to 40°C. When fitted with a plug-in Touch Screen Display, operating temperature is 0 to 40°C.
**Shipping and Storage Temperature:** -20 to 55°C.
**Humidity:** 5 to 95%rh, non-condensing.

**Wiring Terminals:** Pluggable screw terminal blocks (low voltage only) max. conductor size Ø1.5mm (16 AWG)

**Inputs:**
**Number and Type:**
2 Digital Pulse Counting Inputs. User can select positive or negative pulses using jumper pin. Maximum pulse count rate 2 per second (subject to controller load) 50ms minimum on or off time per pulse.
10 Universal Inputs (digital, resistive, 0 to 10Vdc).
User can make any one of the ten inputs analogue, resistive, or dry contact by configuring jumper pins located on the controller.

**Outputs:**
**Number and Type:**
6 Digital Outputs (Line Relay) 5A resistive.
4 Analogue Outputs (0 to 10Vdc).
**Current Ratings:** 5A at 230Vac.

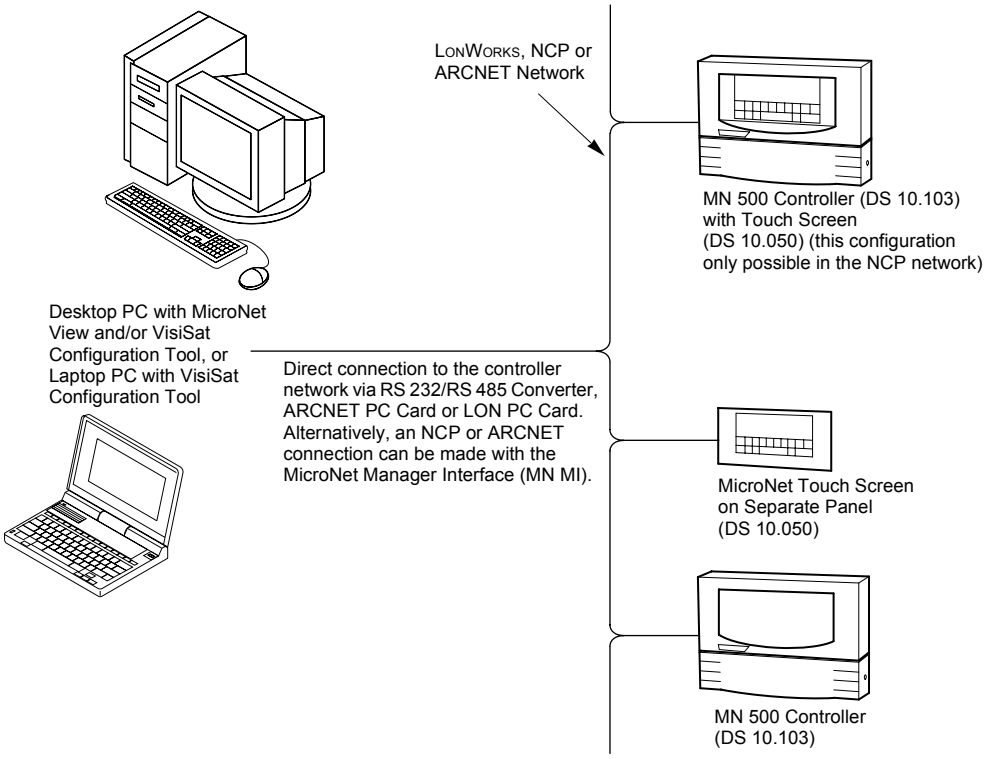
**Power Failure Reserve:** Controller EEPROM preserves memory for 10 years under normal conditions of use. The software clock will stop during a power failure. If the controller has an RTC card, then the time will not be lost.

## ACCESSORIES

| | |
|---|---|
| ECH-74401 | PCLTA-20/FT-10 PCI (32-bit) Desktop Interface |
| LIB-4-485 | RS 232/RS 485 Converter to connect PC to NCP network |
| LON-TERM1 | Single LON® Terminator for Free Topologies |
| LON-TERM2 | Double LON Terminator for Bus Topologies (two required) |
| MN-DK | Display Wall Mounting Kit |
| MN-LCD-100 | MicroNet LCD Display |
| MN-LCDP-100 | MicroNet LCD Display (for panel mounting) |
| MN-TK | Trunking Mounting Kit |
| MNA-C | ARCNET Communications card |
| MNA-R10 | ARCNET Router |
| MNL-C | MicroNet LonWorks Communications card |
| MNN-COM | NCP Plug-in card required for installation in MN 500 or MN 620, when connecting controller to NCP network |
| MNN-MI-100 | MicroNet Manager Interface |
| MNN-TS-100 | MicroNet Touch NCP Screen Display |
| MNN-TSP-100 | MicroNet Touch NCP Screen Display (for panel mounting) |
| MNN-RTC | Real Time Clock Card for MNN Series Controllers |
| MN-VSCORE | VisiSat Configuration Tool (requires Visio 2000 software), core software (NCP & ARCNET) |
| MN-VSLON | VisiSat LON plug-in (requires MN-VSCORE), required for LON MN 500 |
| PCI20-485 | PCI card (DC coupled EIA-485 NIM) to connect PC/Laptop to ARCNET network |
| WPA-LON-1 | PC ISA card (16-bit) to connect PCs to LonWorks FTT-10 network |
| WPA-LON-2 | PC (PCMCIA) card to connect Laptop PCs to LonWorks FTT-10 network |

# TYPICAL SYSTEM DIAGRAM

**I/A SERIES MICRONET MN 500 INTERFACE**




## COMMUNICATIONS

**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 fashion. Controllers on an NCP network connect to MicroNet View 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 (MNN-MI-100). An optional MicroNet Touch Screen Display (MNN-TS-100) can be mounted directly on the controller or on a self-contained panel. An NCP network has a communications speed of up to 9.6k baud.

**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 fitting the optional ARCNET card on each controller and MicroNet Manager Interface (MN MI) on an NCP network. An ARCNET communications network can host up to 95 devices per sub net, and up to 95 sub nets using ARCNET Routers. Controllers on an ARCNET network can communicate with other controllers in a peer-to-peer fashion. The controllers connect to the MicroNet View software via an MN MI only and the VisiSat Configuration Tool software via an MN MI or an ARCNET PC card. An optional MicroNet Touch Screen Display (MNN-TS-100) can be mounted directly on the controller or on a self-contained panel. A user can connect to an I/A Series MicroNet programmable controller with this Touch Screen Display. An ARCNET network has a communications speed of 156k baud.

**LonWorks** A LonWorks FTT-10 Free Topology communications network can host up to 63 devices per segment. This can be increased to 128 using a repeater. Details of network design and wiring requirements can be found at www.echelon.com/Products. Controllers on this network communicate with other controllers in a peer-to-peer fashion and connect to MicroNet View and the VisiSat Configuration Tool via the standard LON FTT-10 cards. MicroNet View provides alarm management and dynamic trend logging. Applications can be prepared and downloaded to application specific I/A Series MicroNet controllers from the VisiSat Configuration Tool. The MNN-MI-100 with LonWorks card supports an ENM (Embedded Network Management) database with a complete listing of all devices on the network and the connections (bindings) between them. MicroNet View provides alarm management and dynamic and historical logging for the network. An optional Touch Screen Display (MNN-TS-100 with LonWorks card) can be mounted on a self-contained panel. A LonWorks FTT-10 network has a communications speed of up to 78k baud.

## APPLICATIONS

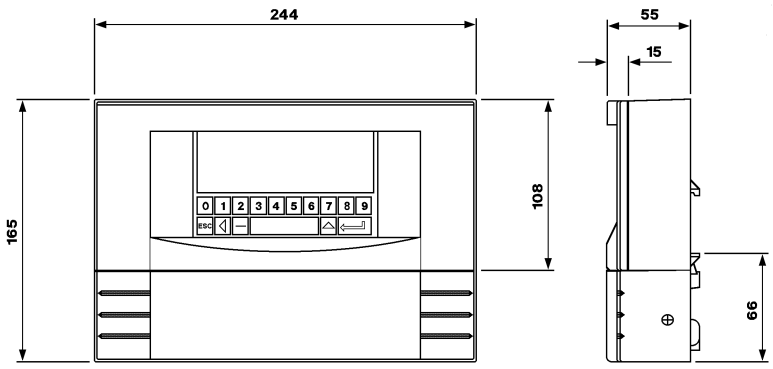
Designed for new system installations, the MicroNet MN 500 Controllers provide control for the following types of applications:

- 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

When used on an NCP or ARCNET communications network, MN 500 controllers connect to a PC running VisiSat Configuration Tool and MicroNet View software, either directly using the relevant PC card or via the MicroNet Manager Interface (MNN-MI-100). For a LonWorks network, PC connection is direct (via LON PC card) only. To be used on a LonWorks or an ARCNET network, the MN 500 controller must be fitted with the relevant LON or ARCNET plug-in card.

## DIMENSION DIAGRAM




Dimensions in mm

Weights:

| | |
|---|---|
| MN 500 | 1043.2g |
| ARCNET Card | 18.3g |
| LonWorks Card | 32.1g |

**WARNINGS -**

**RELAY OUTPUTS COULD BE AT MAINS POTENTIAL.**

**THE RTC BOARD CONTAINS A LITHIUM CHLORIDE BATTERY WHICH IS COMPLETELY SAFE WHILST IN NORMAL USE. THE BATTERY MUST BE DISPOSED OF IN AN AUTHORISED GROUND FILL SITE.**

**Cautions**

- **Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.**
- **This is a 24Vac device. Do not exceed rated voltage. Local wiring regulations and usual safety precautions apply.**
- **24Vac must be supplied by a transformer conforming to EN 60742.**
- **Do not exceed the maximum ambient temperature.**
- **Interference with parts under sealed covers invalidates guarantee.**
- **The design and performance of Satchwell equipment is subject to continuous improvement and therefore liable to alteration without notice.**
- **Information is given for guidance only and Satchwell do 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 Satchwell Control Systems Limited Customer Care Centre for details.**

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