BMS integration

XML

ETHERNET BASED BMS INTEGRATION

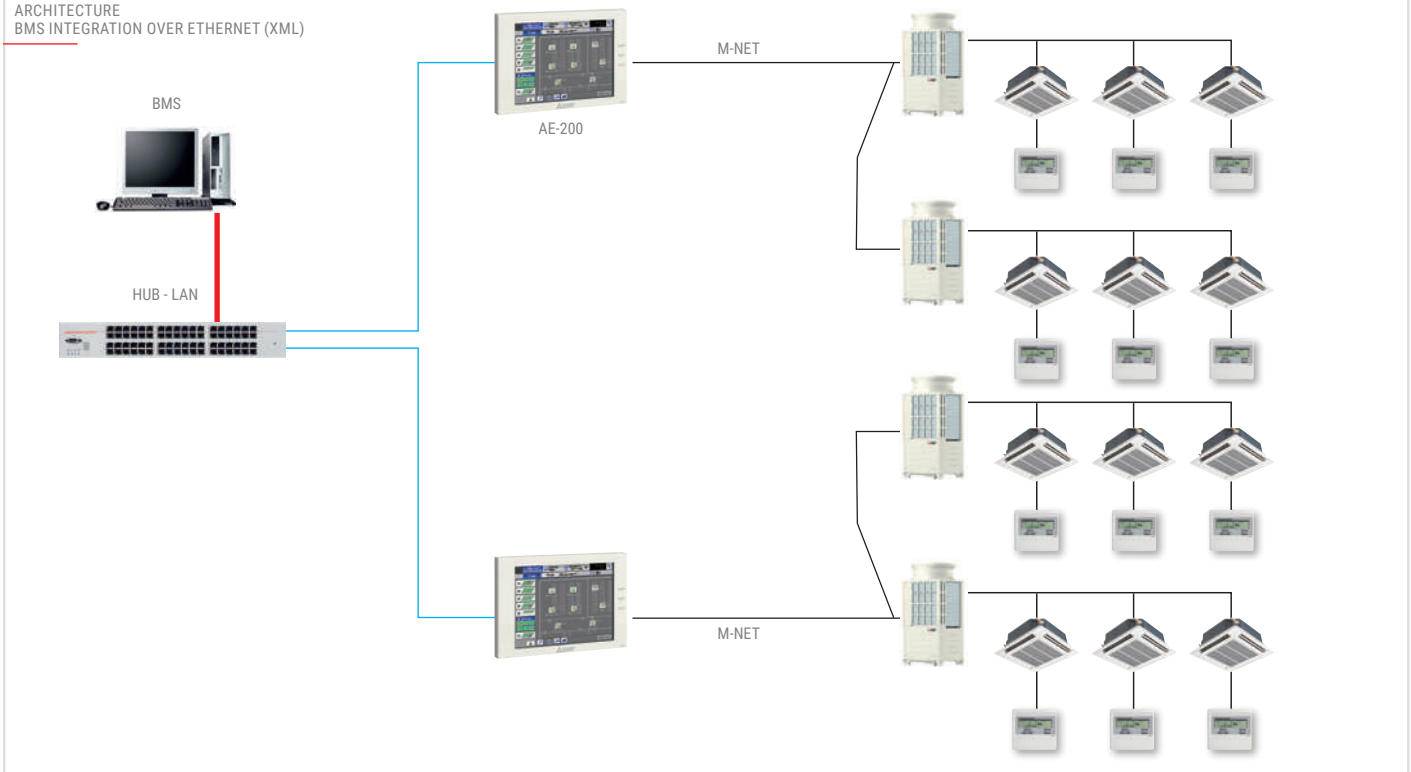
AE-200

EW-50

XML - Ethernet based BMS integration

XML is an innovative new communication system developed specifically for exchanging data over the web. XML makes it possible to create custom software extremely simply, which can even be used with a standard internet browser. The XML protocol makes it possible to integrate with a BMS system using the AE-200E/EW-50 WEB Server centralised controllers, with no additional dedicated hardware interfaces. As all the information necessary for the BMS system is available in XML format directly over the Ethernet communication port of the AE-200E / EW-50 controller, it is simply necessary to connect both the AE-200E / EW-50 WEB Server centralised controllers and the BMS computer system to the same network. Connecting to a BMS system with the XML protocol is extremely simple, as the Ethernet network platform is used. No dedicated conversion or interface hardware is needed, as shown in the typical layout schematic.

ARCHITECTURE
BMS INTEGRATION OVER ETHERNET (XML)



LMAP04

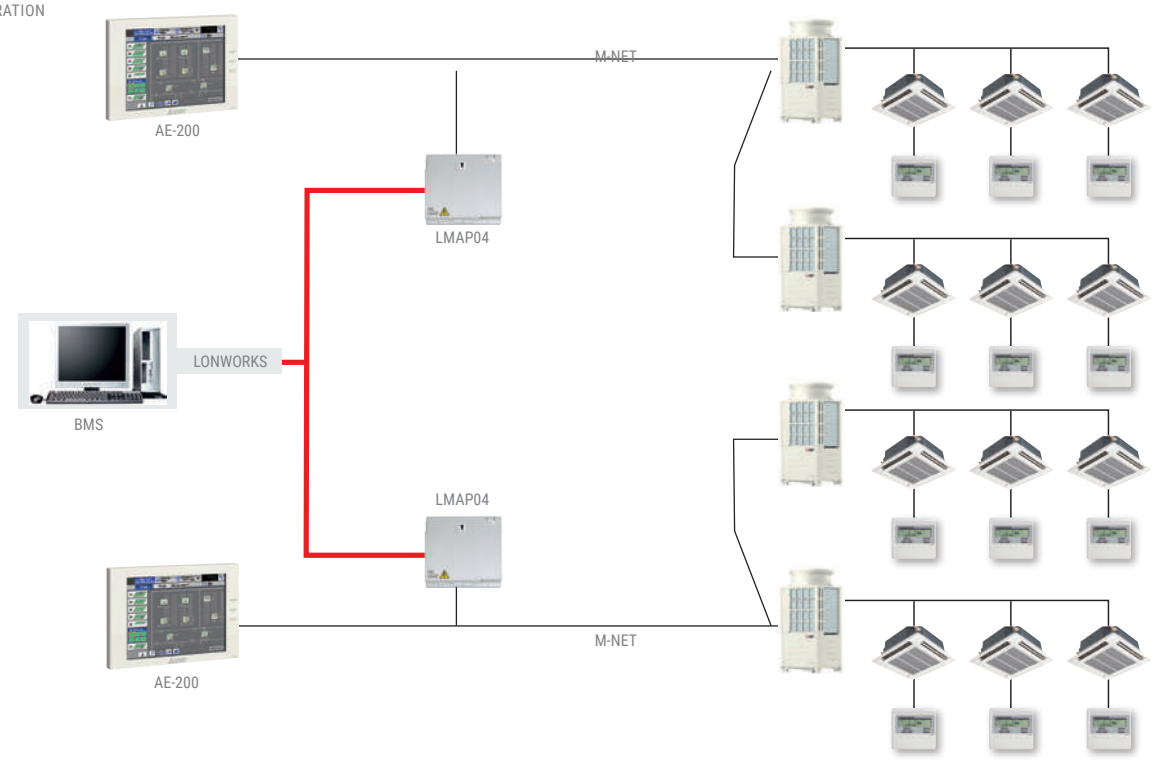
BMS FOR LONWORKS® NETWORKS

LMAP - BMS integration for LonWorks® networks

The LMAP04 interface allows Mitsubishi Electric air conditioners to communicate with third party BMS supervisor and management systems through the LonWorks® network system. The hardware of the interface consists of an electronic board with software integrated in the board itself, which needs no configuration.

The LMAP04 interface may be installed with any remote control or centralised controller of the Mitsubishi Electric range.
Each LMAP04 interface can control up to 50 indoor units, each with its own unique address. In installations with AE-200E / EW-50 WEB Server centralised controllers, the LMAP04 interface offers the same modularity as the controllers themselves. In these cases, a separate interface must be installed for each centralised controller.

ARCHITECTURE BMS INTEGRATION OVER LONWORKS NETWORK



Functions

OPERATION

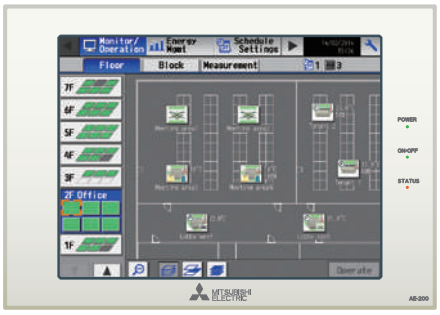
FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Mode	Set operating mode
Fan speed	Set fan speed
Set temperature	Set temperature setpoint
Set Temperature (Cool)	Set temperature in cooling mode for Dual Setpoint function
Set Temperature (Heat)	Set temperature in heating mode for Dual Setpoint function
Set Temperature (Auto)	Set temperature in Auto mode for Dual Setpoint function
Set Setback Temp (High)	Set upper limit for maintenance temperature function
Set settable temp. range	Set settable temp. range
Set Setback Temp (Low)	Set lower limit for maintenance temperature function
Reset filter indicator	Reset filter indicator
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable local mode selection
Disable local filter indicator reset	Disable/enable local operating mode selection
Disable temperature setting	Disable/enable setpoint setting
Set Lossnay mode	Set Lossnay operating mode
Force off	Force unit to off state

MONITORING

FUNCTION	DESCRIPTION
On/Off	View unit on/off state
Mode	View unit operating mode
Fan speed	View fan speed
Set temperature	View temperature setpoint
Set Temperature (Cool)	View setpoint temperature for cooling mode with Dual Setpoint function
Set Temperature (Heat)	View setpoint temperature for heating mode with Dual Setpoint function
Set Temperature (Auto)	View setpoint temperature for Auto mode with Dual Setpoint function
Lossnay mode	View Lossnay unit operating mode
Filter indicator	View filter indicator signal
Indoor temperature	View indoor ambient temperature
Disable local On/Off	View status of Disable local On/Off function
Disable local mode selection	View status of Disable local mode selection function
Disable local filter indicator reset	View status of Disable local filter indicator reset function
Disable temperature setting	View status of Disable temperature setpoint setting function
Force off	View Force off function status
Alarm signal	View alarm signal
Error code	View error code
Communication status	View communication status

BACnet® Pin code

BMS INTEGRATION FOR BACNET® NETWORKS

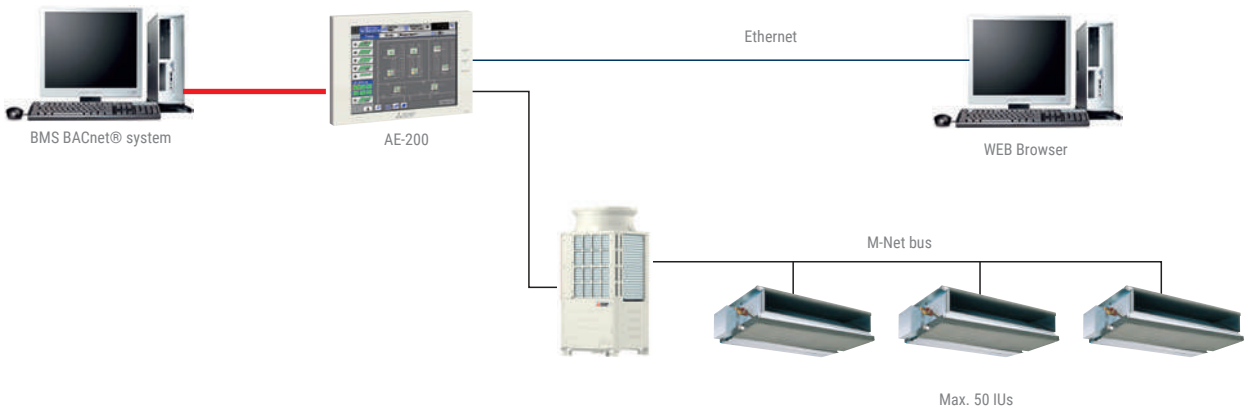


PIN code for interfacing with BACnet® network

The BACnet® protocol was originally developed by ASHRAE in North America specifically for HVAC applications (Heat, Ventilation, Air Conditioning).
It was subsequently also adopted in Europe as one of the standard communication solutions for air conditioning systems, together with LonWorks®, and other protocols. The capabilities of the BACnet® protocol make it the ideal system for large installations and for complex, multi-level building management processes.

A new function developed for WEB Server 3D centralised controllers (AE-200 and EW-50) now makes it possible to interface Mitsubishi Electric systems directly with the BACnet® network of the building without installing additional hardware components.
The centralised controller is connected to the network via a dedicated Ethernet port on the back of the controller itself, included in addition to the port already used for connection to a LAN local network
A BACnet® PIN code license must be purchased for each individual centralised controller. Each centralised controller enabled with a BACnet® PIN code license may manage up to 50 indoor units and 50 groups.

ARCHITECTURE



Functions

OPERATION

FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Mode	Set operating mode
Fan speed	Set fan speed
Set temperature	Set temperature setpoint
Set Temperature (Cool)	Set temperature in cooling mode for Dual Setpoint function
Set Temperature (Heat)	Set temperature in heating mode for Dual Setpoint function
Set Temperature (Auto)	Set temperature in Auto mode for Dual Setpoint function
Set Setback Temp (High)	Set upper limit for maintenance temperature function
Set Setback Temp (Low)	Set lower limit for maintenance temperature function
Reset filter indicator	Reset filter indicator
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable/enable local operating mode selection
Disable local filter indicator reset	View status of Disable filter indicator reset function
Disable temperature setting	Disable/enable setpoint setting

MONITORING

FUNCTION	DESCRIPTION
Force off	Force unit to off state
On/Off	View unit on/off state
Mode	View unit operating mode
Fan speed	View fan speed
Set temperature	View temperature setpoint
Set Temperature (Cool)	View setpoint temperature for cooling mode with Dual Setpoint function
Set Temperature (Heat)	View setpoint temperature for heating mode with Dual Setpoint function
Set Temperature (Auto)	View setpoint temperature for Auto mode with Dual Setpoint function
Set Setback Temp (High)	View upper limit set for maintenance temperature function
Set Setback Temp (Low)	View lower limit set for maintenance temperature function
Filter indicator	View filter indicator signal
Indoor temperature	View indoor ambient temperature
Disable local On/Off	View status of Disable local On/Off function
Disable local mode selection	View status of Disable local mode selection function
Disable local filter indicator reset	View status of Disable filter indicator reset function
Disable temperature setting	View status of Disable temperature setpoint setting function
Force off	View Force off function status
Alarm signal	View alarm signal
Error code	View error code
Communication status	View communication status

ME-AC-MBS-100

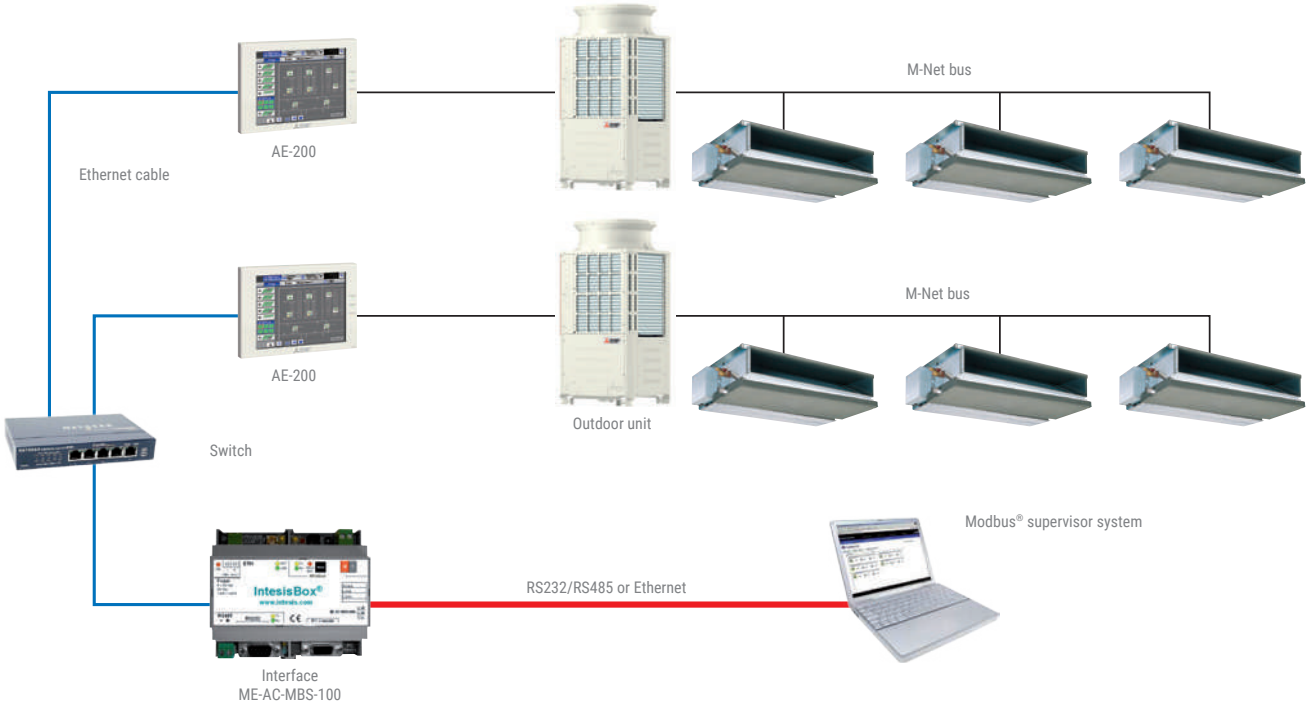
BMS INTERFACE FOR MODBUS® NETWORKS

ME-AC-MBS-100 – BMS interface for Modbus® networks

The Modbus® communication protocol was initially used for PLC networks. Mitsubishi Electric offers an interface capable of controlling up to 100 indoor units (ME-AC-MBS-100) for managing a VRF CITY MULTI installation with a BMS system.

The interface is connected to the Modbus® supervisor system either by an RS232/RS485 serial connection or a TCP/IP over Ethernet connection, and is connected to the Mitsubishi Electric VRF CITY MULTI installation by Ethernet.

ARCHITECTURE



Functions

OPERATION

FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Mode	Set operating mode
Set temperature	Set temperature setpoint
Air flow direction	Set air flow direction
Fan speed	Set fan speed
Disable remote control	Disable/enable control from remote controller
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable/enable local operating mode selection
Disable temperature setting	Disable/enable setpoint setting
Disable local filter indicator reset	Disable/enable filter indicator reset
Set Lossnay ventilation	Set Lossnay ventilation speed
Reset filter indicator	Reset filter indicator
Reset error status	Reset error status
Active polling	Enable/disable group polling
Force off	Force unit to off state

MONITORING

FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Communication error	Communication error with centralised controller
Mode	Set operating mode
Set temperature	Set temperature setpoint
Air flow direction	Set air flow direction
Fan speed	Set fan speed
Disable remote control	Disable/enable control from remote controller
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable/enable local operating mode selection
Disable temperature setting	Disable/enable setpoint setting
Disable local filter indicator reset	Disable/enable filter indicator reset
Set Lossnay ventilation	Set Lossnay ventilation speed
Filter signal	'Filter dirty' indicator signal
Error signal	Signal indicating unit in error state
Indoor temperature	View indoor ambient temperature
Reset filter indicator	Reset filter indicator
Reset error status	Reset error status
Group communication error	Group communication error
Active polling	View group polling disabled/enabled status
Force off	Force unit to off state

ME-AC-KNX-100

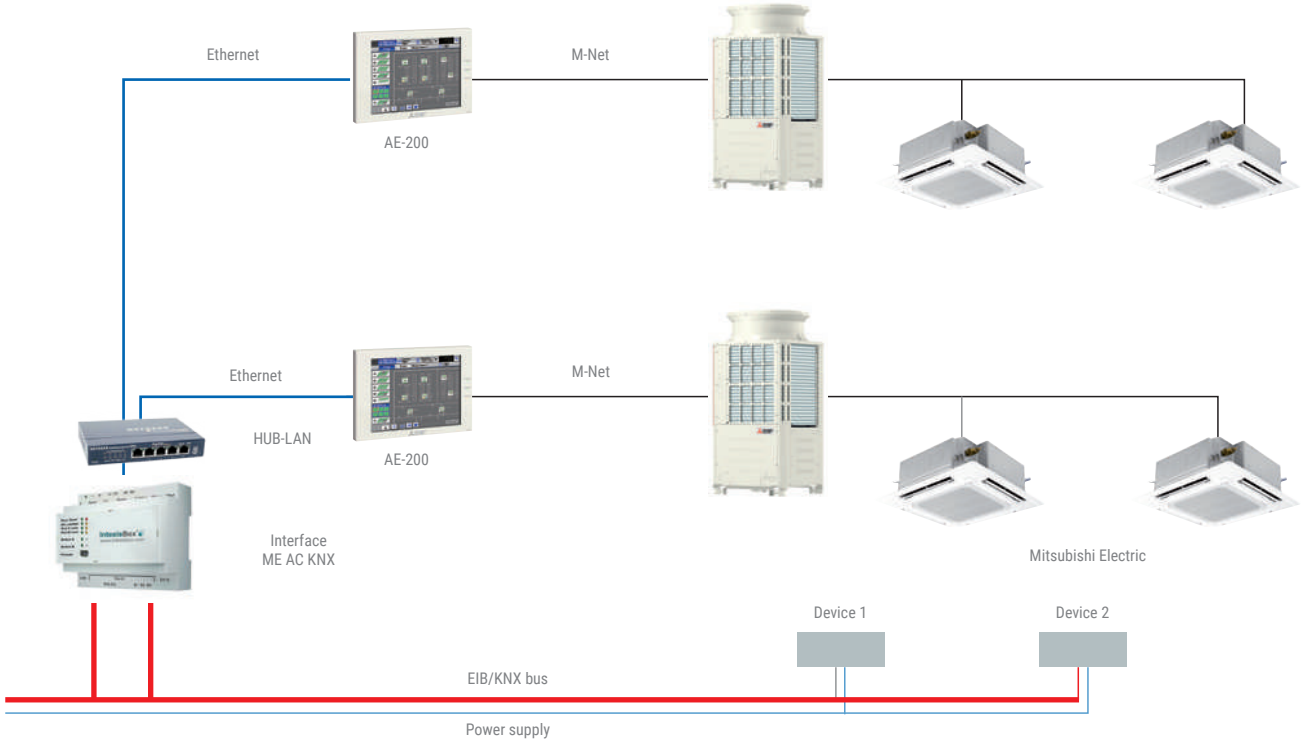
BMS INTERFACE FOR KNX® NETWORKS

ME-AC-KNX-100 – BMS interface for KNX® networks

KNX® is one of the global standards for automated household and building control. This open protocol ensures cross-compatibility between products from different manufacturers.

Mitsubishi Electric offers an interface capable of controlling up to 100 indoor units (ME AC KNX – 100) for managing a VRF CITY MULTI installation with a BMS system. The interface is connected directly to the EIB bus linked to the KNX® network, and to the Mitsubishi Electric VRF CITY MULTI installation by Ethernet.

ARCHITECTURE



Functions

OPERATION

FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Mode	Set operating mode
Set temperature	Set temperature setpoint
Air flow direction	Set air flow direction
Fan speed	Set fan speed
Disable remote control	Disable/enable control from remote controller
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable/enable local operating mode selection
Disable temperature setting	Disable/enable setpoint setting
Disable local filter indicator reset	Disable/enable filter indicator reset
Set Lossnay ventilation	Set Lossnay ventilation speed
Reset filter indicator	Reset filter indicator
Reset error status	Reset error status
Inlet Temp	Set virtual setpoint (temperature reading from KNK)

MONITORING

FUNCTION	DESCRIPTION
On/Off	Switch unit on/off
Communication error	Communication error with centralised controller
Mode	Set operating mode
Set temperature	Set temperature setpoint
Air flow direction	Set air flow direction
Fan speed	Set fan speed
Disable remote control	Disable/enable control from remote controller
Disable local On/Off	Disable local On/Off control
Disable local mode selection	Disable/enable local operating mode selection
Disable temperature setting	Disable/enable setpoint setting
Disable local filter indicator reset	View status of Disable filter indicator reset function
Set Lossnay ventilation	Set Lossnay ventilation speed
Filter signal	'Filter dirty' indicator signal
Error signal	Signal indicating unit in error state
Indoor temperature	View indoor ambient temperature
Reset filter indicator	Reset filter indicator
Reset error status	Reset error status
Group communication error	Group communication error
Inlet Temp	View virtual temperature value (from KNK)

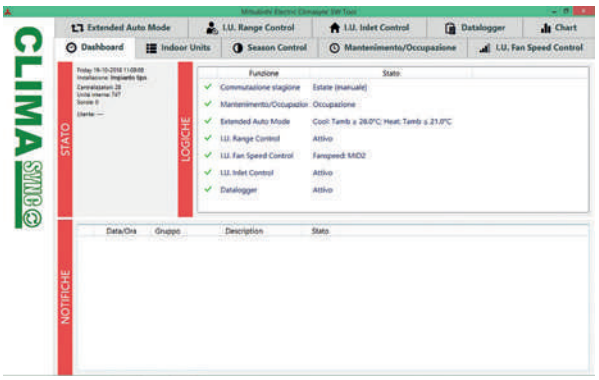
Centralised control setting and synchronisation system: CLIMASYNC

CLIMASYNC

CLIMASYNC

CLIMASYNC is a software application developed specifically by Mitsubishi Electric to optimise the synchronised, operation, management and setting of Mitsubishi VRF systems to improve comfort and energy efficiency.
CLIMASYNC offers a suite of functions, customisable by the administrator of the installation, for optimising the operation of the indoor units (or groups of indoor units) in the system in relation to a number of parameters such as outdoor temperature.
It also makes it possible to supervise and control indoor units from a Web Server centralised controller over an Ethernet network.
The software introduces additional control logic and functions not native to VRF systems.
What sets this solution apart is that it allows the transverse synchronisation of multiple VRF systems with multiple centralised controllers (Web Server).

CLIMASYNC



CLIMASYNC

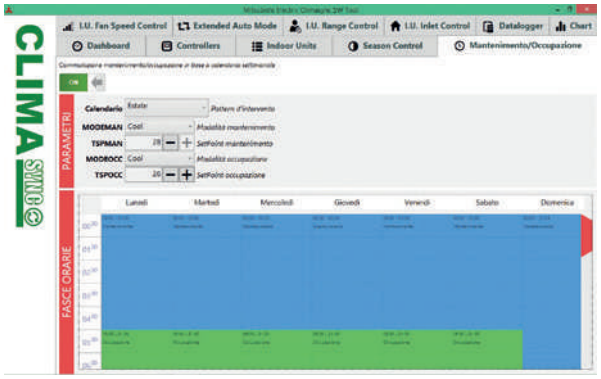
Fan speed control

The "Fan management" function may be used to set and synchronise a specific fan speed for all indoor units enabled for the function in accordance with a repeating weekly timer schedule.
The administrator simply has to select the indoor units enabled for the function, select the days of the week, and then select the fan speed settings for each time bracket. While the function is active, even though the user can continue to modify fan speed from their remote control, CLIMASYNC will force fan speed to the setting configured by the administrator. During time brackets for which the function is not enabled, the user may set the fan speed locally with complete freedom.

Switching between Maintenance/ Occupancy modes during weekly time schedule

The switching function lets the administrator programme the indoor units to switch automatically between "Maintenance" and "Occupancy" modes in accordance with a weekly timer schedule with a resolution of one hour. "Maintenance" mode requires a minimum or maximum setpoint to be defined (depending on season) to prevent the VRF CITY MULTI system from switching off completely during unoccupied periods. This is particularly useful for winter operation, where restarting the system from very low indoor temperature conditions will significantly increase energy consumption and increase the time required for capacity control and modulation.

SCHEDULE-BASED SWITCHING BETWEEN MAINTENANCE/OCCUPANCY MODES



Extended range switching between AutoCool/AutoHeat modes

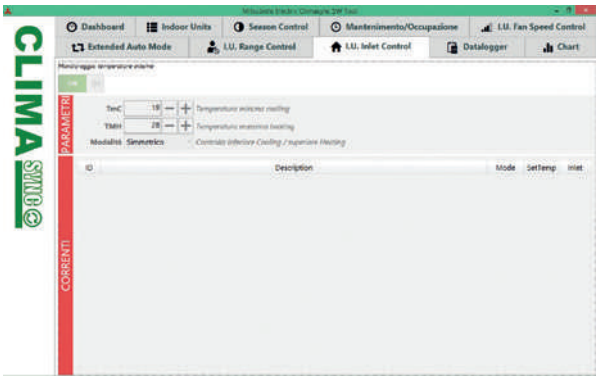
The EAM (Extended Auto Mode) function allows automatic switching mode to operate over a more extended range not constrained directly by setpoints, to allow the system to function predominantly in either Cooling or Heating mode.

EXTENDED AUTO MODE

Inlet temperature control

The IC (Inlet Control) function monitors the inlet temperature values of the indoor units, compares these values against 2 configurable limits (one for Cooling mode and one for Heating mode), and indicates any indoor units with an inlet temperature not within the permitted limit.
Note: if the "e-mail notification" function is enabled, daily report e-mails are sent specifying any units not within the permitted temperature range.

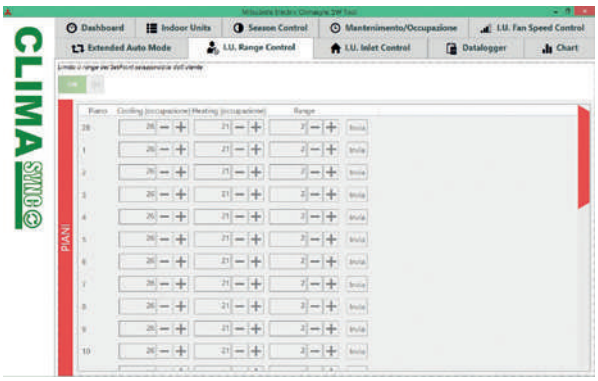
INLET CONTROL



Settable setpoint range control

The RC (Range Control) function may be used to limit the setpoint temperature range settable by the user from the remote control either for individual units or collectively for all the indoor units in the installation.
CLIMASYNC queries the settings for each indoor unit once every minute and corrects any settings made by users not within the permitted range.
The permitted deviation from the setpoint is editable and configurable by the administrator.

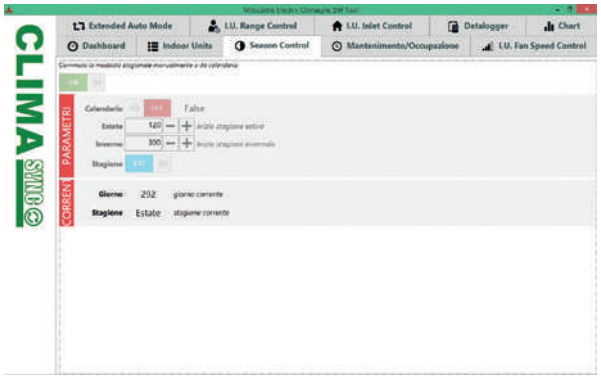
RANGE CONTROL



Season Control

The SC (Season Control) functions switches all the indoor units in the installation between Summer/Winter mode either automatically, in accordance with an annual schedule, or in centralised manual mode.
- 'Winter' and 'summer' seasonal operation refer respectively to heating and cooling mode.
• When automatic season control is enabled, the system is switched automatically between modes in accordance with two numerical parameters defining the start day for summer mode and the start day for winter mode.
• When automatic season control is disabled, the system may be switched manually between modes (Manual summer/Manual winter).

SEASON CONTROL



Installation

- This function requires a centralised controller (AE-200 or EW50) and a PC (not included), which must be connected to each other via an Ethernet LAN network.
- CLIMASYNC software may only be installed once the installation is installed completely and in operation
- Different versions of CLIMASYNC may be purchased depending on the maximum number of indoor units in the installation (50, 100, 150 or 200). Purchase of the CLIMASYNC software includes:
- On-site installation of software
- On-site training of personnel assigned to using software
- Operator manual

Advantages for the user

- Control and synchronise the air conditioning functions of multiple systems in the same building and managed by different centralised controllers
- Customisable ambient comfort in each indoor space
- Eliminates all energy wastage/temperature overshoots
- Saves energy
- Maintains log of external temperature and setpoint values which can be exported by the software administrator for analysing system behaviour and performance history.


MITSUBISHI
ELECTRIC
LIVING ENVIRONMENTAL SYSTEMS