

# APPLICATION NOTES



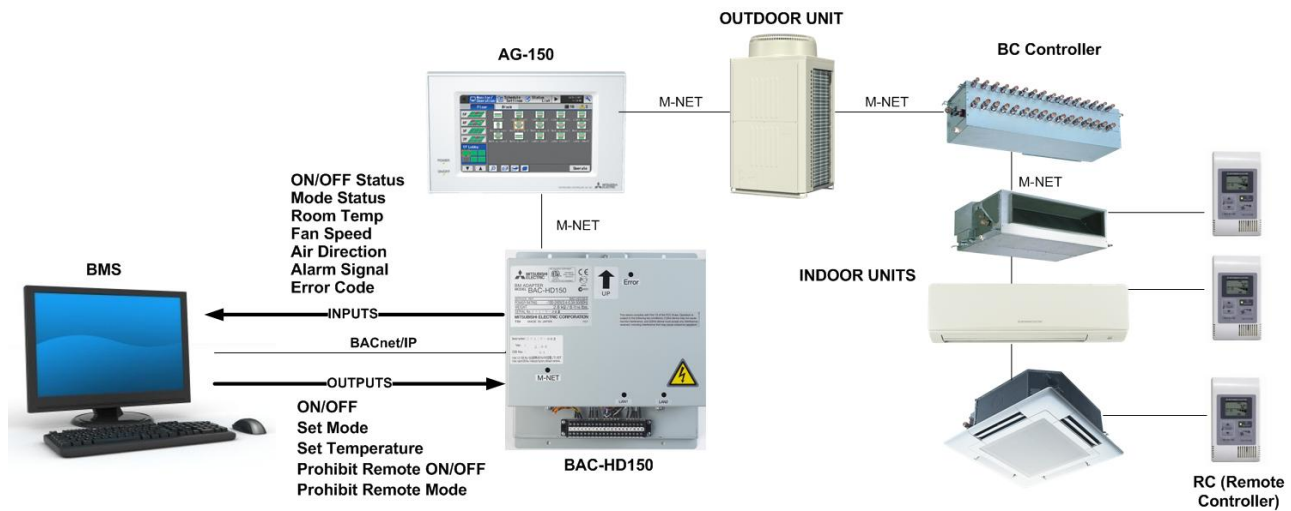
## **Application Note 3007**

### **CMCN Indoor Unit BACnet™ Sequence**

This Application Note covers details regarding a CITY MULTI system with BACnet.

Figure 1 shows a Typical CITY MULTI system with BACnet. Table 1 shows the control and monitoring points available. Available points and available point range values are subject to the indoor unit model. See engineering manual for each indoor unit model for more details.

Each command shall be sent only once with consideration to refresh times. The last command sent to the indoor unit will determine the action.



**Figure 1.** Typical CITY MULTI® control with BACnet™

**Table 1.** BMS system control and monitoring points

BACnet Instance#	Indoor Unit Control Point Description	Software Points							Functions			Alarms		
		Binary Output	MultiState Output	Binary Value	Binary Input	MultiState Input	Analog Input	Analog Value	Schedule	Trend	Display	High Limit	Low Limit	Abnormality
xxxx01	ON/OFF	X							X	X				
xxxx05	Set Mode		X						X	X				
xxxx10	Set Temperature						X	X	X	X				
xxxx13	Prohibit ON/OFF at RC			X			X	X	X	X				
xxxx14	Prohibit Mode at RC			X			X	X	X	X				
xxxx02	ON/OFF Status				X					X	X			
xxxx06	Mode State					X				X	X			
xxxx09	Room Temperature						X			X	X	X	X	
xxxx08	Fan Speed State					X					X			
xxxx23	Air Direction State					X					X			
xxxx03	Alarm Signal (unit)				X					X	X			X
xxxx04	Error Code (system)					X				X	X			X

## Sequence of Operation

Each Indoor Unit shall be scheduled ON by the BMS system at the occupied times defined by the owner.

When using a CITY MULTI® **R2-Series** outdoor unit coupled with a BC Controller, the indoor units shall be set to AUTO mode during occupied times. During unoccupied times the indoor units shall be set to HEAT or COOL based on outside air enthalpy conditions.

When using a CITY MULTI® **Y-Series** outdoor unit, The BMS shall determine and set the MODE of ALL the indoor units based on outside air enthalpy conditions. All indoor units will need to be in the same MODE for the **Y-Series** outdoor unit to switch between heating and cooling.

The BMS shall set the occupied and unoccupied temperature set-points based on the owner's request. Temperature set-points may be changed at the RC (remote controller) if installed in the space.

The BMS shall send PROHIBIT commands for prohibiting the MODE button at the local remote controller in the space during occupied and unoccupied times.

The BMS shall send PROHIBIT commands for prohibiting the ON/OFF button at the local remote controller in the space during occupied times only. The BMS shall send PERMIT commands for permitting the ON/OFF button at the local remote controller in the space during unoccupied times to allow for setback override.

During unoccupied times the BMS shall send the OFF command to the indoor unit at the start of unoccupied times and every two hours thereafter to reinforce the setback conditions. The BMS shall monitor the Room Temperature at the remote controller in the space and command the unit ON if the owner specified night setback limits are exceeded. The BMS shall send the COOL mode command when the upper limit is exceeded or the HEAT mode command when the lower limit is exceeded. The BMS shall send the upper or lower limit as the space temperature set-point during unoccupied time.

## Required Equipment

The BAC-HD150 BACnet™ is BTL listed as an Application Specific Controller and used in conjunction with an AG-150 or GB-50ADA can provide control points for monitor and operation via BACnet™/IP.

## Notes

1. BMS system shall provide necessary programming to accomplish sequence of operations and scheduling using the points available through the BAC-HD150.
2. One BAC-HD150 shall be installed with one AG-150 or GB-50ADA and controlling 50 indoor units or less. Systems with more than 50 indoor units will require multiple BAC-HD150's and multiple AG-150's or GB50ADA's.
3. The available Set Temperature Range can be found in the *CITY MULTI® Engineering Manual* for each indoor unit model.
4. DIDO and AI controllers are not supported by the BACnet™ and LonWorks® interfaces.
5. The TC-24 and GB24 Centralized Controllers are not supported for use with the BACnet™ and LonWorks® interfaces.