

Open Protocol System



MIM-B18

- Hardware Specification



Size		240 * 255 * 64.8 mm (Width * Length * Depth)
Power supply	Source	DC Adaptor
	Input	100~240VAC (±10%), 50/60Hz
	Output	12V 3A
Operating humidity range		0%RH ~ 90%RH
Storage temperature range		-20 °C ~ 70 °C
Communication connection		Lower layer : RS485 (to centralized controllers) Upper layer : Ethernet 100Base-T (S-NET3, S-NET mini, Web Browser) LonWorks layer : TP/FT-10A(Free topology 78kbps)
Max. communication length		Lower layer : Maximum 1000m (RS485) Upper layer : 100m (for one segment without repeaters) LonWorks layer : 78 kilobits-per-second bit rate for distances up to 500 meters in free topology or 2700 meters in bus topology with double terminations
Max. number of interface		Lower layer : 16 centralized controllers, 80 interface modules Upper layer : Unlimited

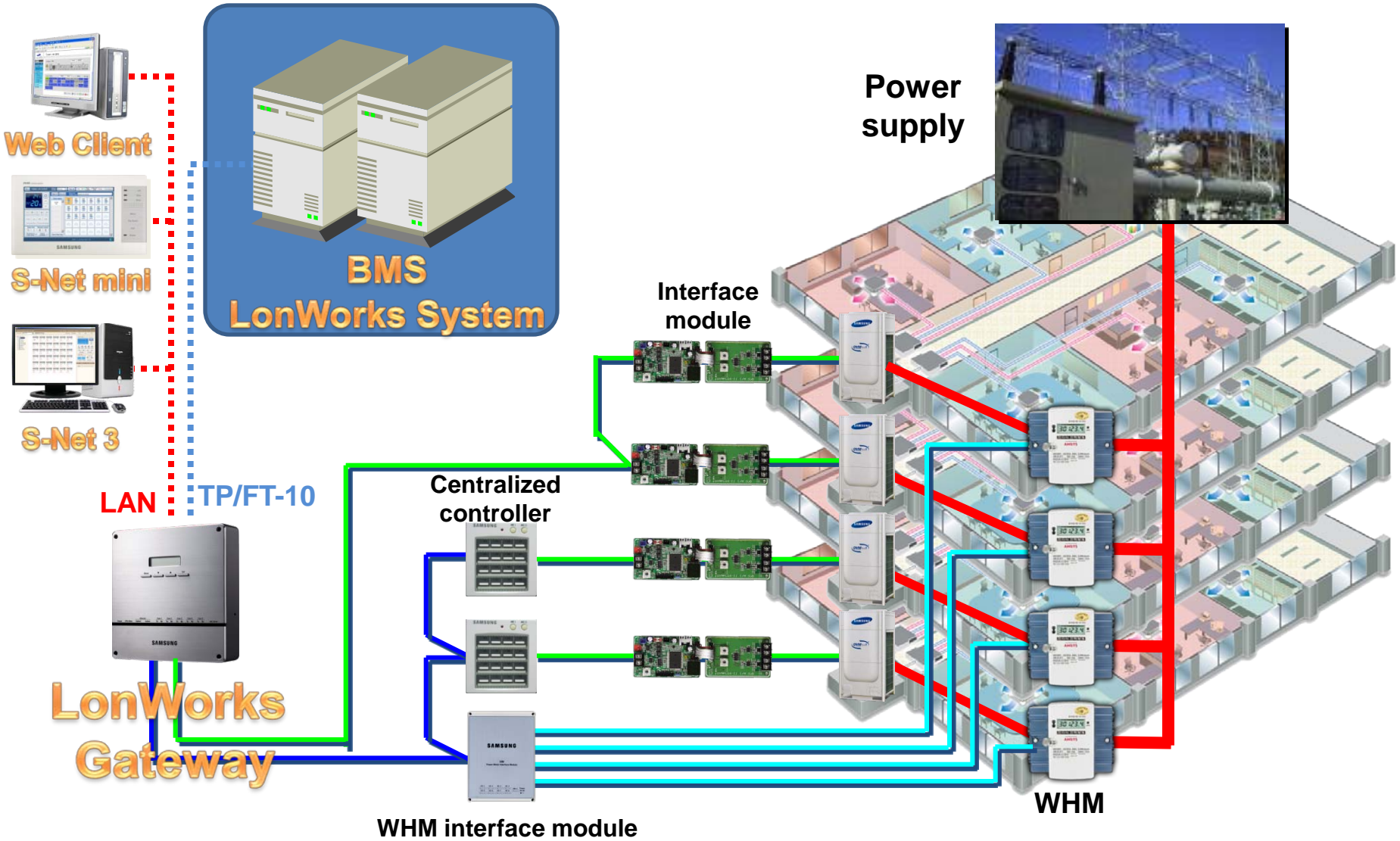
- Software Specification



<p>General Function</p>	<ul style="list-style-type: none"> • Built-in web server for PC-independent management and remote access control • Multiple upper-layer control access (S-NET 3, S-NET Mini, Web-client) • Weekly/Daily schedule control • Power distribution function • Current time management even during power failure (for 24 hours) • Emergency stop function with simple contact interface • Individual/Group control of up to 128 indoor units include ERV, AHU • User editable control logic • Accessible level management. • Dynamic security management • Operation & error history management • Data storage in non-volatile memory & SD memory
<p>LonWorks Function</p>	<ul style="list-style-type: none"> • Up to 27 network variable settings per one indoor unit. • Support network variable to control and monitor normal indoor unit, ERV and AHU • Monitoring Power distribution data. • Setting the high & low temperature limit • Accessible level management.

LonWorks Gateway – MIM-B18

- System Structure

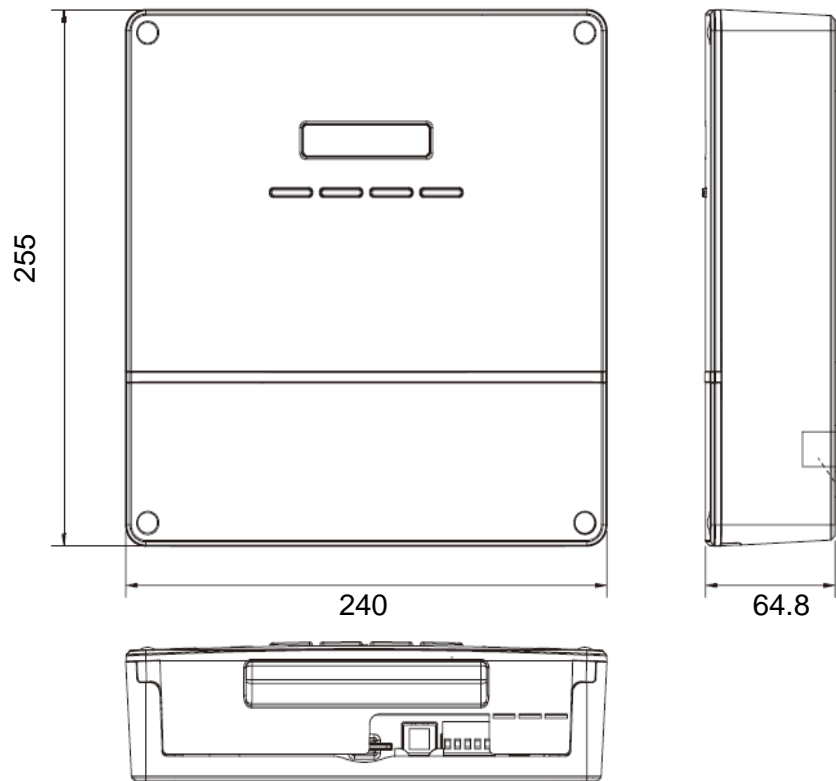


- Compatible Interface

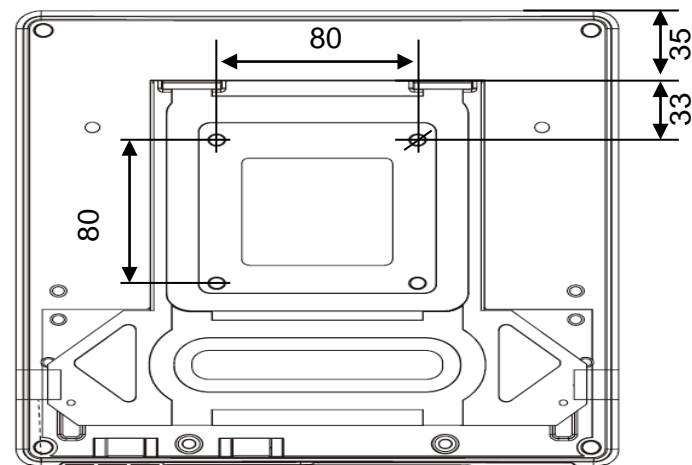
No	Device	Model	Remark
1	Upper-layer device	MST-P3P(S-NET3) MST-S3W(S-NET mini) Web-Client	HUB or network environment is required to support multiple upper-layer devices.
2	Centralized controller	MCM-A202, MCM-A202A MCM-A202B	
3	Interface Module	MIM-B04A, MIM-B13A, MIM-B13B	
4	WHM interface module (Serial Type)	MIM-B12	Up to 8 watt-hour meters are supported for 1 MIM-B12. Specified Korean watt-hour meter
5	WHM interface module (Pulse Type)	MIM-B16	Up to 8 watt-hour meters are supported for 1 MIM-B16. Support local WHM for power distribution system
6	Power meter	Specified Korean watt-hour meter	Local watt-hour meter can be used after launching MIM-B16
7	DI/DO	No power dry contact	DI: Max.8, DO: Max.6
8	Outdoor unit	Support all Samsung system air-conditioner outdoor unit	

- Dimension

Main Part

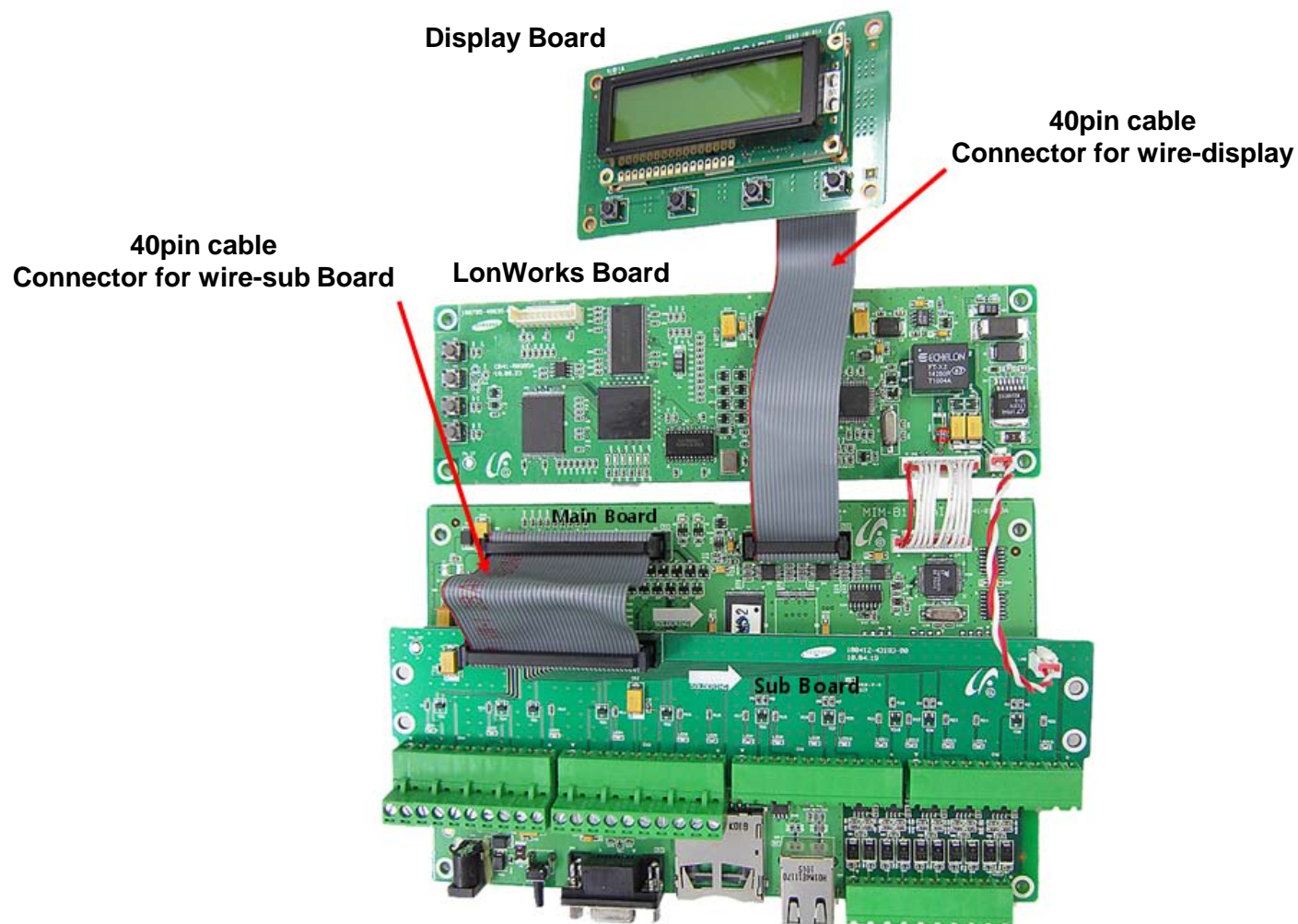


Holder

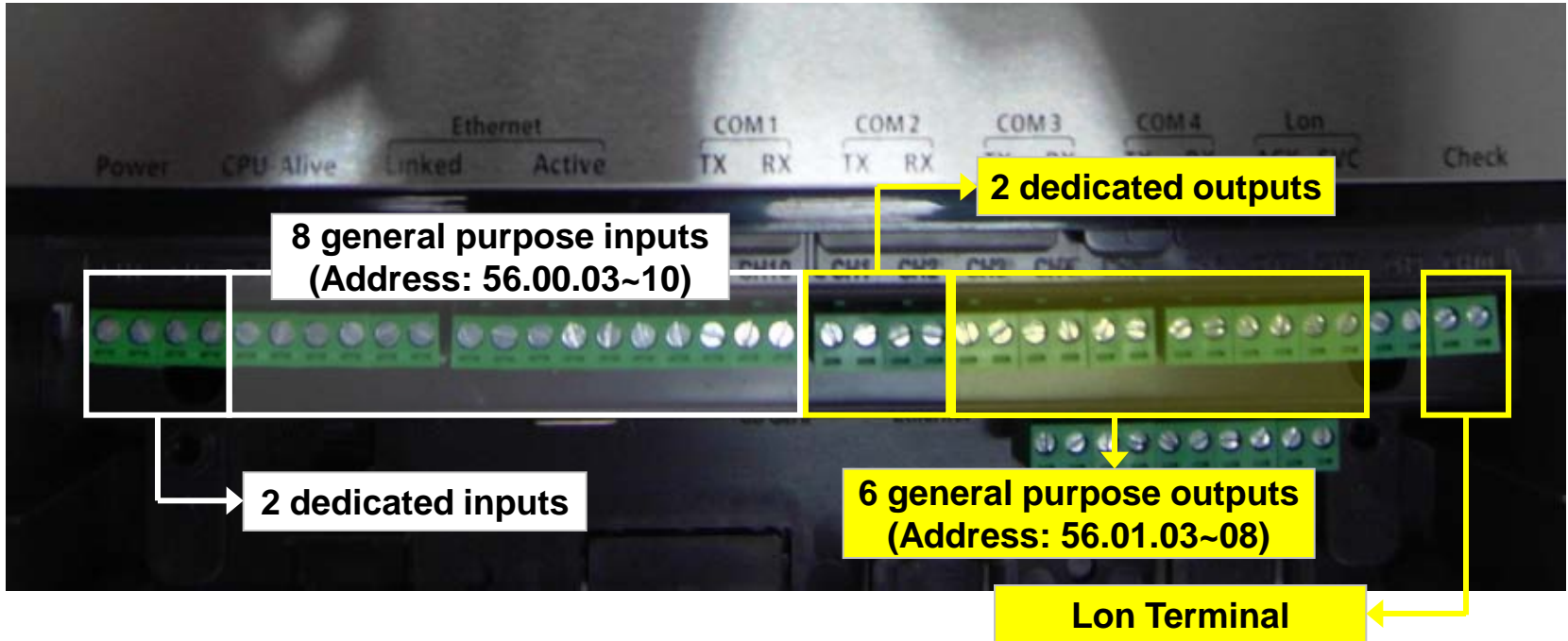


Unit : mm

- Boards & Connectors

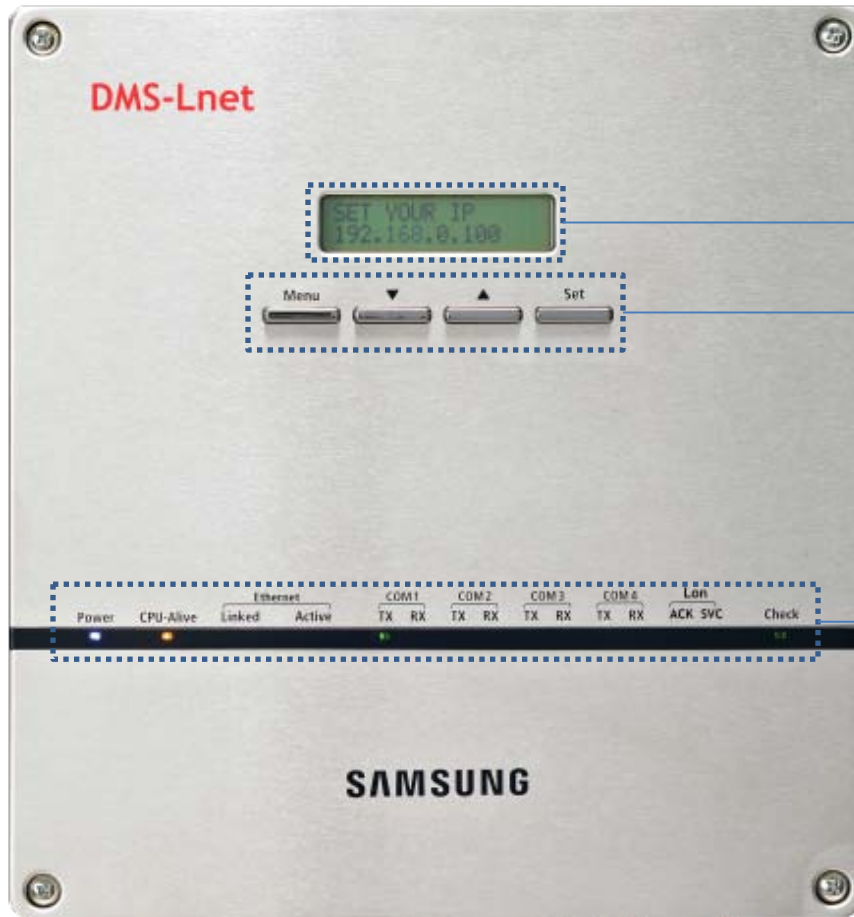


- Connectors



- Interface with external control system
- 2 dedicated voltage-free inputs (Emergency control and others)
- 8 voltage-free contact inputs for general purposes (Open/short contact input)
- 2 dedicated voltage-free outputs (Operation/Error)
- 6 12-voltage outputs for external interlocking systems
- Terminal Block for LonWorks communication (TP/FT-10)
- Inputs and outputs have each fixed address
 - Digital input address: 56.00.03~56.00.10
 - Digital output address: 56.01.03~56.01.08

- Exterior



LCD Display

Shows current time and IP address. Various messages will be displayed depending on button input.

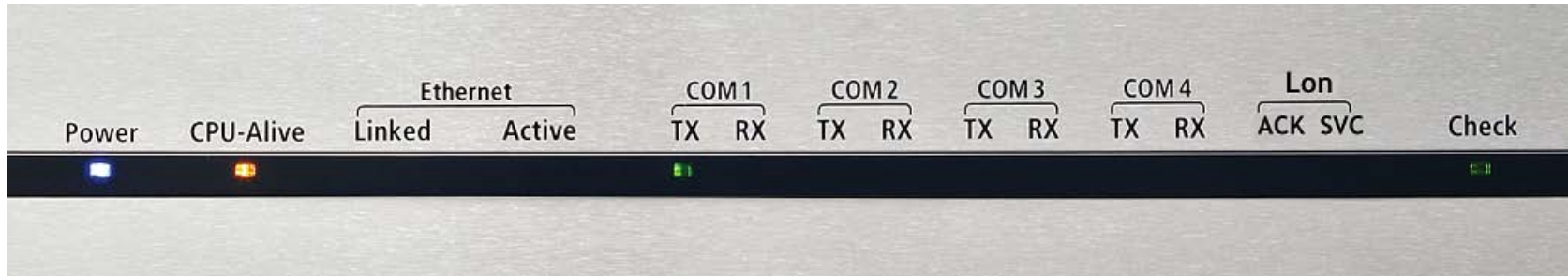
LCD operation button

There are 4 buttons(Menu, ▼(Down), ▲(Up),Set) and you can access to menu and move, check the menu.

LED Indicator

Check 15 LED status such as Power, CPU-Alive, Ethernet-Linked/Active, COM1~4-TX/RX, Lon ACK, Lon SVC and Check.

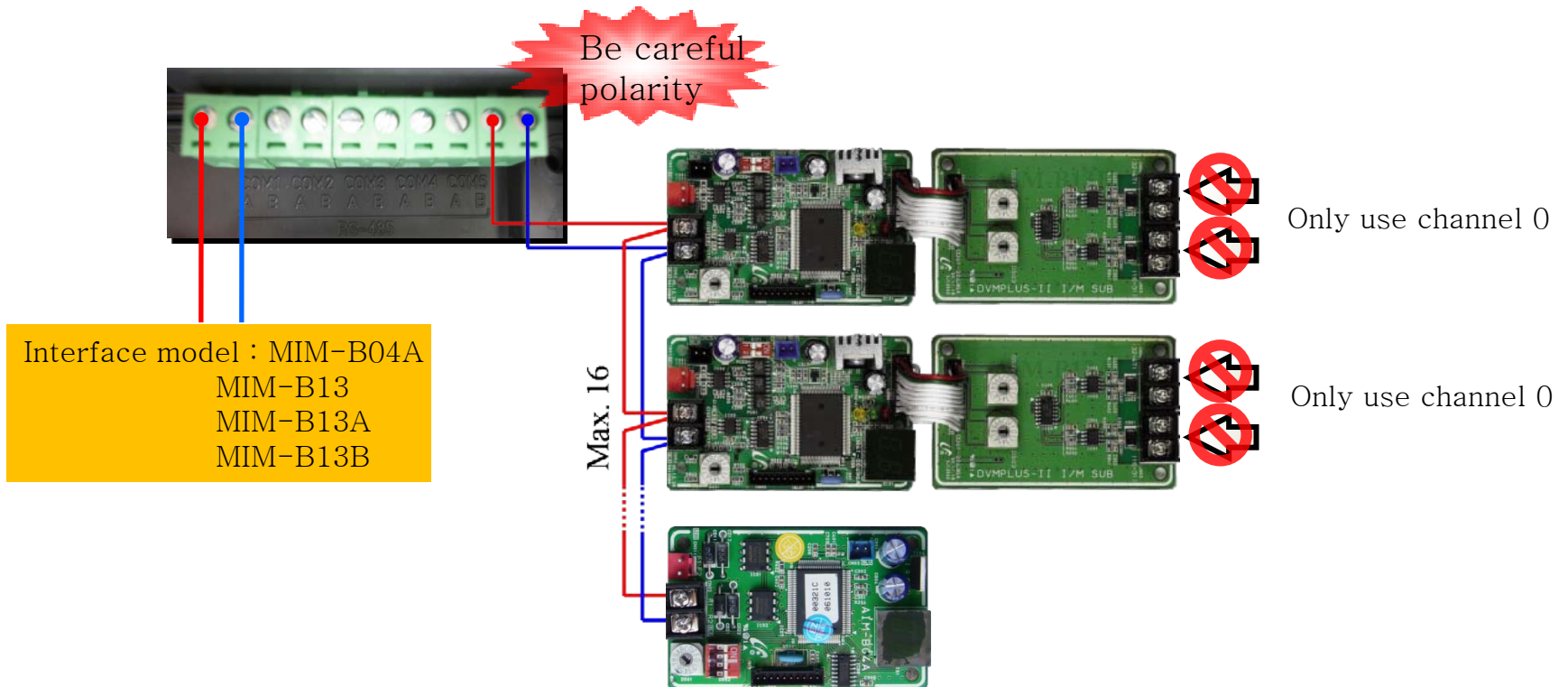
- LED Indicator



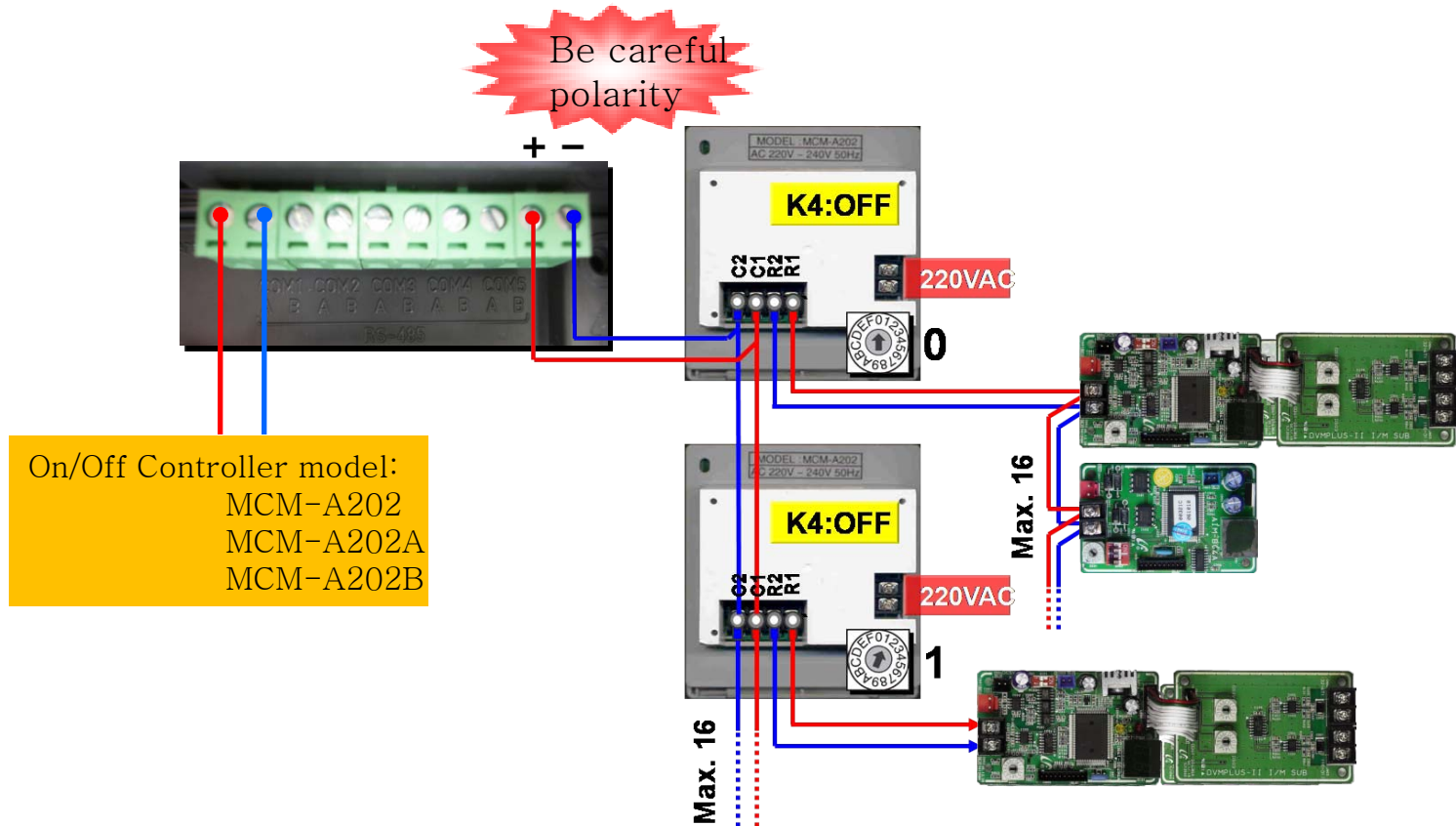
Item	Name	Status
Power	Power indicator	Turns blue when the power is supplied.
CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation.
Ethernet-Linked	Internet connection indicator	Turns green during normal connection.
Ethernet-Active	Internet data transmission/reception indicator	Blinks in orange during normal transmission/reception.
COM1~4 – TX	Channel 1~4 Centralized controller/Interface module Data transmission Indicator	Blinks in green during normal reception.
COM1~4 – RX	Channel 1~4 Centralized controller/Interface module Data reception Indicator	Blinks in green during normal reception.
Lon ACK	LonWorks data reception indicator	Blinks in green during normal reception.
Lon SVC	LonWorks device status indicator	Blinks in green during un-configured. - Needs commission by integration tool (Ex. LonMaker)
Check	Indoor/Outdoor unit/Communication check Indicator	Turns green when notice occurs.

- Wiring to interface module

LonWorks gateway can be directly connect to interface module without On/Off Controller.
Up to 16 interface module connecting per one communication port.



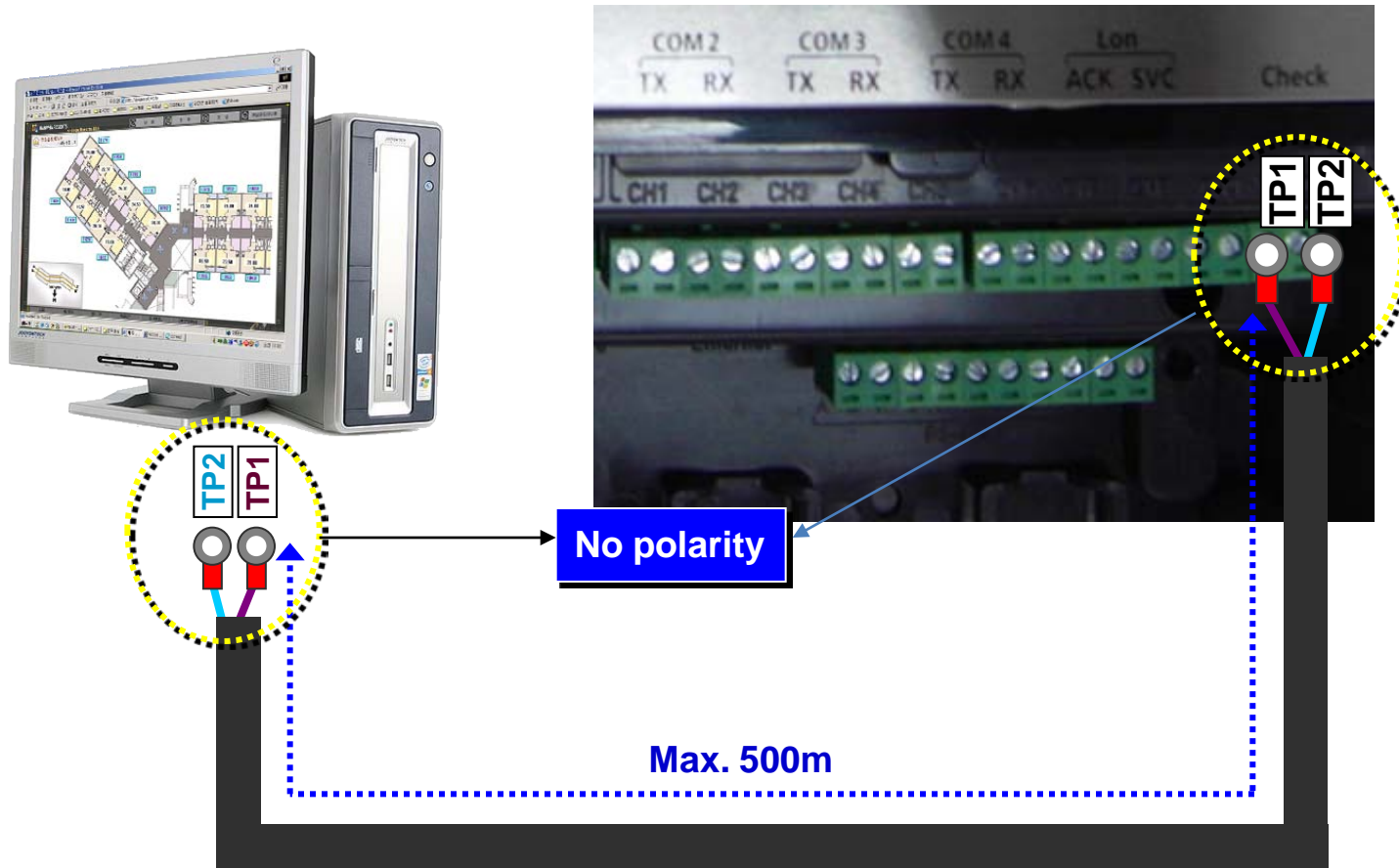
- Wiring to On/Off Controller



※ CAUTION

- 16 On/Off Controllers can be connected to each 485 communication port.
- Total number of On/Off Controllers connected to LonWorks gateway are limited below 16EA.

- Wiring to LonWorks System



Wire : Twisted pair (TP/FT-10, TP/XF-1250 and TP/XF-78)

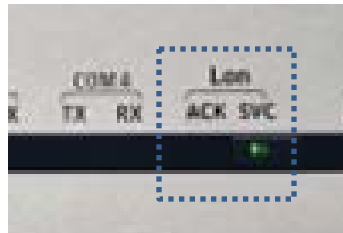
NOTE : The maximum distance for free topology connection → 500m between nodes

- Commission to LonWorks System

To activate the Service Pin, Press and hold [SET] button for more than 3 seconds



During commission, Neuron ID will be sent and [SVC] LED of the front panel will be lit up for a second.



- Check and change Object ID in LonWorks Function Setting

.Check the Object ID

- Object IDs are assigned in order from 1 to 128 when initial tracking is executed.

.Change the Object ID

- Click [Edit] Box and change the Object ID
- Object ID ranging from 1 to 128
- Object ID shouldn't be duplicated in each devices
- Device without object ID can't transmit data to LonWorks system.

Channel	Device	Address	Name	ObjectID
CH0	Central controller	00	CAUR-00	
	Interface module	00.00		
	Indoor unit	00.00.00 (00)	00.00.00	<input type="text" value="1"/>
	Indoor unit	00.00.01 (01)	00.00.01	<input type="text" value="2"/>
	Indoor unit	00.00.02 (02)	00.00.02	<input type="text" value="3"/>
	Indoor unit	00.00.03 (03)	00.00.03	<input type="text" value="4"/>
	Indoor unit	00.00.04 (04)	00.00.04	<input type="text" value="5"/>
	Indoor unit	00.00.05 (05)	00.00.05	<input type="text" value="6"/>
	Indoor unit	00.00.06 (06)	00.00.06	<input type="text" value="7"/>
	Indoor unit	00.00.07 (07)	00.00.07	<input type="text" value="8"/>
	Indoor unit	00.00.08 (08)	00.00.08	<input type="text" value="9"/>
	Indoor unit	00.00.09 (09)	00.00.09	<input type="text" value="10"/>
	Outdoor unit	00.00.00	00.00.00	
DMS	DMS DI-DO <input type="button" value="Setting"/>	56 (System)	DMSDIDO	

Object ID

- Network Variable Information in LonWorks Function Setting

Network variable information of the selected device will be displayed

Channel	Device	Address	Name	ObjectID
CH0	Central controller	00	CAUR-00	
	Interface module	00.00		
	Indoor unit	00.00.00 (00)	00.00.00	<input type="text" value="1"/>
	Indoor unit	00.00.01 (01)	00.00.01	<input type="text" value="2"/>
	Indoor unit	00.00.02 (02)	00.00.02	<input type="text" value="3"/>
	Indoor unit	00.00.03 (03)	00.00.03	<input type="text" value="4"/>
	Indoor unit	00.00.04 (04)	00.00.04	<input type="text" value="5"/>
	Indoor unit	00.00.05 (05)	00.00.05	<input type="text" value="6"/>
	Indoor unit	00.00.06 (06)	00.00.06	<input type="text" value="7"/>
	Indoor unit	00.00.07 (07)	00.00.07	<input type="text" value="8"/>
	Indoor unit	00.00.08 (08)	00.00.08	<input type="text" value="9"/>
	Indoor unit	00.00.09 (09)	00.00.09	<input type="text" value="10"/>
	Outdoor unit	00.00.00	00.00.00	
DMS	DMS DI·DO Setting	56 (System)	DM·SDIDO	

Click object ID

Device Information		
NV Name	NV Type	Value
nviOnOff	SNVT_switch	<input type="text" value="0.0.0"/>
nviApplicMode	SNVT_hvac_mode	HVAC_AUTO
nviSetpoint	SNVT_temp_p	<input type="text" value="24.00"/>
nviFanSpeedCmd	SNVT_switch	<input type="text" value="0.0.0"/>
nviFanSwing	SNVT_switch	<input type="text" value="0.0.0"/>
nviFilterReset	SNVT_switch	<input type="text" value="0.0.0"/>
nviUserLockout	SNVT_switch	<input type="text" value="2.0.1"/>
nviOccOpModeCmd	SNVT_switch	<input type="text" value="0.0.0"/>
nviCoolTempLock	SNVT_switch	<input type="text" value="18.0.0"/>
nviHeatTempLock	SNVT_switch	<input type="text" value="30.0.0"/>

- Input and monitor value in LonWorks network variable

You can select the values to modify the Input type objects

You can check the value of the output type object from 'LonWorks gateway information' section.

Device Information		
NV Name	NV Type	Value
nviOnOff	SNVT_switch	0.0 0
nviApplicMode	SNVT_hvac_mode	HVAC_AUTO
nviSetpoint	SNVT_temp_p	24.00
nviFanSpeedCmd	SNVT_switch	0.0 0
nviFanSwing	SNVT_switch	0.0 0
nviFilterReset	SNVT_switch	0.0 0
nviUserLockout	SNVT_switch	2.0 1
nviOccOpModeCmd	SNVT_switch	0.0 0
nviCoolTempLock	SNVT_switch	18.0 0
nviHeatTempLock	SNVT_switch	30.0 0



Click value item

Input item in LonWorks network variable

nvoSpaceTemp	SNVT_temp_p	20.00
nvoApplicMode	SNVT_hvac_mode	HVAC_AUTO
nvoSetpoint	SNVT_temp_p	24.00
nvoOnOff	SNVT_switch	0.0 0
nvoFanSpeed	SNVT_switch	0.0 0
nvoFanSwing	SNVT_switch	0.0 0
nvoErrorCode	SNVT_count	
nvoDeviceAlarm	SNVT_state	
nvoOccOpMode	SNVT_switch	0.0 0
nvoCoolTempLock	SNVT_switch	18.0 0
nvoHeatTempLock	SNVT_switch	30.0 0
nvoEnergyCon_p	SNVT_elec_kwh_I	3456.7
nvoEnergyCon	SNVT_elec_kwh_I	5869.2
nvoRuntime_p	SNVT_time_hour	148
nvoRuntime	SNVT_time_hour	145
nvoDevListDesc	SNVT_str_asc	5117-61_00.00.00_0_000.000.00_2420

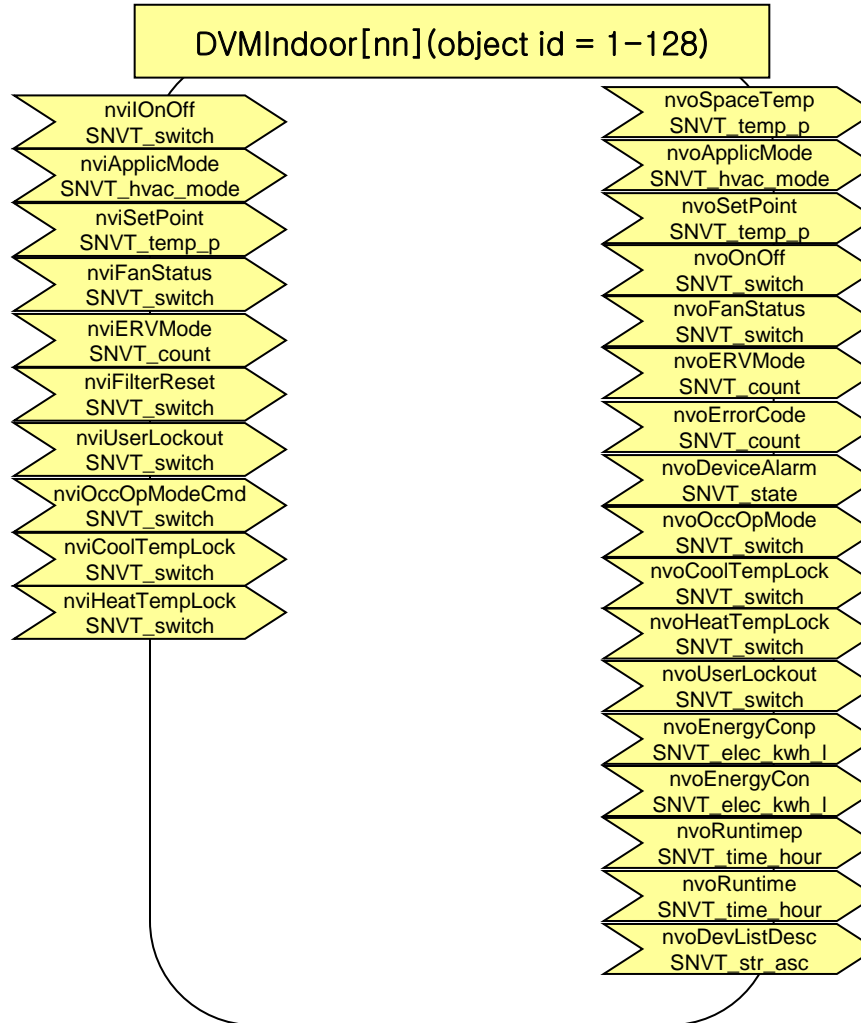
Output item in LonWorks network variable

- Samsung LonWorks Gateway Network Variable List

Indoor Unit(include ERV, AHU)

No	NV Name	NV Type	Remarks
1	nviOnOff	SNVT_switch	ON/OFF command
2	nviApplicMode	SNVT_hvac_mode	Setting operating mode
3	nviSetpoint	SNVT_temp_p	Setting desirable temperature
4	nviFanStatus	SNVT_switch	Setting Wind speed and direction
5	nviERVMode	SNVT_count	Setting ERV operation mode
6	nviFilterReset	SNVT_switch	Filter reset command
7	nviUserLockout	SNVT_switch	Setting the restriction of remote control use
8	nviOccOpModeCmd	SNVT_switch	Setting cooling only mode/ Setting heating only mode
9	nviCoolTempLock	SNVT_switch	Setting the low temperature limit
10	nviHeatTempLock	SNVT_switch	Setting the high temperature limit
11	nvoSpaceTemp	SNVT_temp_p	Display indoor temperature
12	nvoApplicMode	SNVT_hvac_mode	Display operating mode
13	nvoSetpoint	SNVT_temp_p	Display desire temperature
14	nvoOnOff	SNVT_switch	Display ON/OFF status
15	nvoFanStatus	SNVT_switch	Display wind speed and direction
16	nvoERVMode	SNVT_count	Display ERV operation mode
17	nvoErrorCode	SNVT_count	Display Error code
18	nvoDeviceAlarm	SNVT_state	Remote Lock , Filter Sign, Thermo On/Off, Error occurrence status display.
19	nvoOccOpMode	SNVT_switch	Cooling only/Heating only setup status display
20	nvoCoolTempLock	SNVT_switch	Low temperature limit setting status display
21	nvoHeatTempLock	SNVT_switch	High temperature limit setting status display
22	nvoUserLockout	SNVT_switch	Display the restriction of remote control use
23	nvoEnergyCon_p	SNVT_elec_kwh_l	Display electricity usage (Time period)
24	nvoEnergyCon	SNVT_elec_kwh_l	Display electricity usage (Basic date)
25	nvoRuntime_p	SNVT_time_hour	Display used hours (Period)
26	nvoRuntime	SNVT_time_hour	Display used hours (Basic date)
27	nvoDevListDesc	SNVT_str_asc	The summary of device information (Model, Address, Operation Status)

- Samsung LonWorks Gateway Network Variable List Indoor Unit(include ERV, AHU)



- Samsung LonWorks Gateway Network Variable List

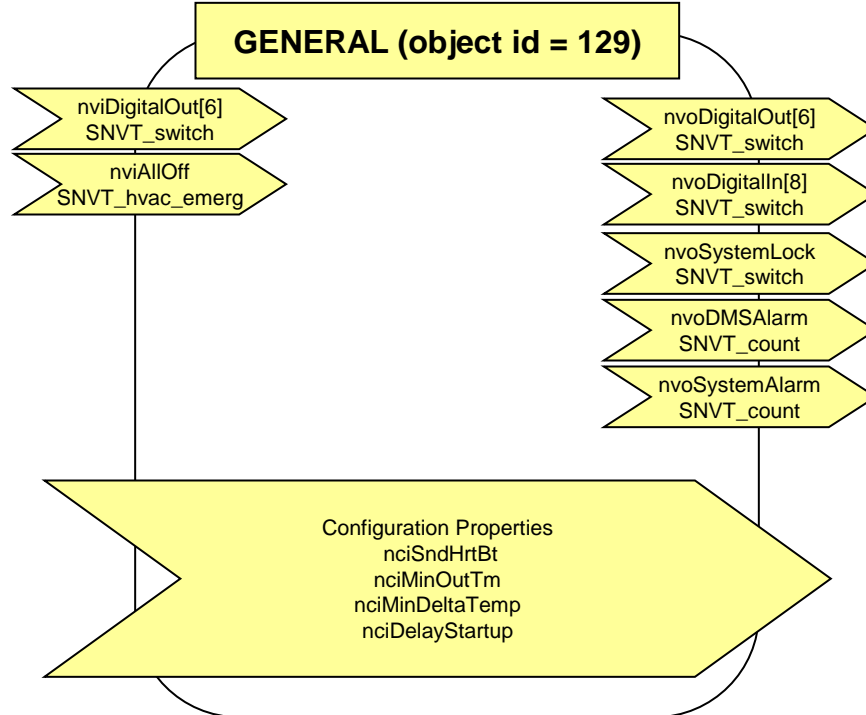
DMS system

No	NV Name	NV Type	Remarks
1	nviDigitalOut[6]	SNVT_switch	Control Digital output of DMS2
2	nviAllOff	SNVT_hvac_emerg	Control all indoor unit/ERV Off
3	nvoDigitalOut[6]	SNVT_switch	Display Digital output status of DMS2
4	nvoDigitalIn[8]	SNVT_switch	Display Digital input status of DMS2
5	nvoSystemLock	SNVT_switch	Display System Lock status of DMS2
6	nvoDMSAlarm	SNVT_count	Display communication error of the sub device connected to DMS2
7	nvoSystemAlarm	SNVT_count	

Configuration Properties

No	NV Name	NV Type	Remarks
1	nciSndHrtBt	SNVT_time_sec SCPTmaxSendTime	Send Heartbeat
2	nciMinOutTm	SNVT_time_sec SCPTminSendTime	Minimum Send Time
3	nciMinDeltaTemp	SNVT_temp_p SCPTminDeltaTemp	Min. difference before update
4	nciDelayStatrup	SNVT_time_sec SCPTpwrupDelay	Delay time after a power-up

- Samsung LonWorks Gateway Network Variable List DMS system & Configuration Properties



- Control and Monitoring Item and Indoor unit

Control and Monitoring Item	The maximum number of connectable indoor units.	Remarks.
27 items (All)	22	In the case that 20 items can be processed per a second and data inquiry interval is 30 seconds.
20 items	30	
15	40	
12	50	
9	64	
6	100	
4	128	

$(20 * \text{inquiry interval}) / \text{control and monitoring Item}$
 = The maximum number of connectable indoor units

Ex) inquiry interval : 30, control and monitoring Item : 12
 $(20 * 30) / 12 = 50$

- Samsung LonWorks Gateway Network Variable List

●nvoSpaceTemp (12)

Description	Indoor temperature
SNVT Type	SNVT_temp_p : Signed Long, 2 bytes
Value and operation	NV value = (temp./10-55)*100 °C Resolution: 0.01 Range: -10.00°C ~ 50.00°C

●nvoApplicMode (13), nviApplicMode(2)

Description	Operation Mode status
SNVT Type	SNVT_hvac_mode : Enumeration (hvac_t)
Value and operation	0: HVAC_AUTO 1: HVAC_HEAT 3: HVAC_COOL 6: HVAC_OFF 9: HVAC_FAN_ONLY 14: HVAC_DEHUMID

●nvoSetpoint (14), nviSetpoint(3)

Description	Set Temperature
SNVT Type	SNVT_temp_p : Signed Long, 2 bytes
Value and operation	NV value = (temp./10-55)*100 °C Resolution: 0.01 Cool: 18.0°C ~ 30.0°C, Heat: 16.0°C ~ 30.0°C

- Samsung LonWorks Gateway Network Variable List

●nvoOnOff (15), nviOnOff(1)

Description	Power ON/OFF status		
SNVT Type	SNVT_switch : Unsigned/signed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

●nvoFanStatus(16), nviFanStatus(4)

Description	Fan Status		
SNVT Type	SNVT_switch : Unsigned/signed Short		
Value and operation		Value	State
	Auto	0.0	0
	Low	1.0	1
	Mid	2.0	1
	High	3.0	1
	Eco	4.0	1
	Turbo	5.0	1
24	Fan Swing Status State : 0 (Stop) State : 1 (Up-Down, Left-Right, All)		

- Samsung LonWorks Gateway Network Variable List

●nvoERVMode (18), nviERVMode(6)

Description	ERV Operation Mode
SNVT Type	SNVT_count : Unsigned Long, 2 bytes
Value and operation	0 : Auto 1 : H/R 2 : Air purification 3 : Sleep 4 : Normal

●nvoErrorCode (19)

Description	Error Code
SNVT Type	SNVT_count : Unsigned Long, 2 bytes
Value and operation	Valid Range : 0 ~ 999 00 00 → No Error Refer to list of Error code

- Samsung LonWorks Gateway Network Variable List

●nvoDeviceAlarm(20)

Description	1. Remote control restriction status 2. Filter alert status 3. Thermo On/Off status 4. Error alert Status																										
SNVT Type	SNVT_state : 16 Unsigned Bitfields																										
Value and operation	<table border="1"> <thead> <tr> <th>Byte</th> <th>Bit1</th> <th>Bit0</th> <th>Operation</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Flags_1</td> <td>0</td> <td>0</td> <td>Unlock</td> <td rowspan="3">nvoUserLockout</td> </tr> <tr> <td>0</td> <td>1</td> <td>Level1</td> </tr> <tr> <td>1</td> <td>0</td> <td>Lock</td> </tr> </tbody> </table>	Byte	Bit1	Bit0	Operation	Remark	Flags_1	0	0	Unlock	nvoUserLockout	0	1	Level1	1	0	Lock										
	Byte	Bit1	Bit0	Operation	Remark																						
Flags_1	0	0	Unlock	nvoUserLockout																							
	0	1	Level1																								
	1	0	Lock																								
<table border="1"> <thead> <tr> <th>Byte</th> <th>Bit</th> <th>Value</th> <th>Operation</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Flags_2</td> <td rowspan="2">Bit10</td> <td>0</td> <td>No alarm</td> <td rowspan="2">nvoFilterAlarm</td> </tr> <tr> <td>1</td> <td>Alarm</td> </tr> <tr> <td rowspan="2">Bit9</td> <td>0</td> <td>Thermo Off</td> <td rowspan="2">Thermo On/Off</td> </tr> <tr> <td>1</td> <td>Thermo On</td> </tr> <tr> <td rowspan="2">Bit8</td> <td>0</td> <td>No Error</td> <td rowspan="2">nvoErrorCode</td> </tr> <tr> <td>1</td> <td>Error</td> </tr> </tbody> </table>	Byte	Bit	Value	Operation	Remark	Flags_2	Bit10	0	No alarm	nvoFilterAlarm	1	Alarm	Bit9	0	Thermo Off	Thermo On/Off	1	Thermo On	Bit8	0	No Error	nvoErrorCode	1	Error			
Byte	Bit	Value	Operation	Remark																							
Flags_2	Bit10	0	No alarm	nvoFilterAlarm																							
		1	Alarm																								
	Bit9	0	Thermo Off	Thermo On/Off																							
		1	Thermo On																								
Bit8	0	No Error	nvoErrorCode																								
	1	Error																									

●nvoOccOpMode(21), nviOccOpModeCmd(9)

Description	Operation Mode restriction													
SNVT Type	SNVT_switch : Unsigned/singed Short													
Value and operation	<table border="1"> <thead> <tr> <th></th> <th>Value</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>Unlock</td> <td>0.0</td> <td>0</td> </tr> <tr> <td>Cool only</td> <td>1.0</td> <td>1</td> </tr> <tr> <td>Heat only</td> <td>2.0</td> <td>1</td> </tr> </tbody> </table>		Value	State	Unlock	0.0	0	Cool only	1.0	1	Heat only	2.0	1	
		Value	State											
	Unlock	0.0	0											
	Cool only	1.0	1											
Heat only	2.0	1												

- Samsung LonWorks Gateway Network Variable List

●nvoCoolTempLock(22), nviCoolTempLock(10)

Description	Setting/monitoring Lower limit temperature and function toggle		
SNVT Type	SNVT_switch : Unsigned/singed Short		
Value and operation	operation	Value	State
	Unlock	Any	0
	Lock	18.0 ~ 30.0	1
	Cool : 18.0°C ~ 30.0°C		

●nvoHeatTempLock(23), nviHeatTempLock(11)

Description	Setting/monitoring upper limit temperature and function toggle		
SNVT Type	SNVT_switch : Unsigned/singed Short		
Value and operation	operation	Value	State
	Unlock	Any	0
	Lock	16.0 ~ 30.0	1
	Heat : 16.0°C ~ 30.0°C		

- Samsung LonWorks Gateway Network Variable List

●nvoEnergyCon_p(24)

Description	Electric consumption value within the period
SNVT Type	SNVT_elec_kwh_I : Signed Quad, 4bytes
Value and operation	Raw range : 0 ~ 999999 Resolution: 0.1

●nvoEnergyCon(25)

Description	Electric consumption value after baselin
SNVT Type	SNVT_elec_kwh_I : Signed Quad, 4bytes
Value and operation	Raw range : 0 ~ 999999 Resolution: 0.1

●nvoRunTime_p(26)

Description	Indoor unit usage within the period
SNVT Type	SNVT_time_hour : Signed Long, 2bytes
Value and operation	Raw range : 0 ~ 65535

●nvoRunTime(27)

Description	Indoor unit usage after baseline
SNVT Type	SNVT_time_hour : Signed Long, 2bytes
Value and operation	Raw range : 0 ~ 65535

- Samsung LonWorks Gateway Network Variable List

●nviFilterReset(7)

Description	Filter alert reset			
SNVT Type	SNVT_switch : Unsigned/singed Short			
Value and operation	Value	State	Operation	remark
	0.0	0	Filter Reset	
	100.0	1	No Action	

●nviUserLockout(8)

Description	Remote control restriction			
SNVT Type	SNVT_switch : Unsigned/singed Short			
Value and operation	Value	State	Operation	remark
	0.0	0	Unlock	
	100.0	1	Level 1	
	100.0	2	Lock	

- Samsung LonWorks Gateway Network Variable List

●nvoDevListDesc (28)

Description	Device Information
SNVT Type	SNVT_str_asc : Unsigned Character Array, 31bytes
Value and operation	Refer to Expansion of nvoDevListDesc

		description	character	value
ascii.	[0]	Model infomation	Alphabet or digit	
	[1]		Alphabet or digit	
	[2]		Alphabet or digit	
	[3]		Alphabet or digit	
	[4]		Alphabet or digit	
	[5]		Alphabet or digit	
	[6]	Separator	Underbar (_)	095
	[7]	Centralized controller address	Alphabet or digit	
	[8]		Alphabet or digit	
	[9]	Separator	Period (.)	046
	[10]	Interface Module address	Alphabet or digit	
	[11]		Alphabet or digit	
	[12]	Separator	Underbar (_)	046
	[13]	Indoor Unit Address	Alphabet or digit	
	[14]		Alphabet or digit	
	[15]	Separator	Underbar (_)	095
	[16]	Unit type	0: 실내기, 1: AHU, 2: ERV	
	[17]	Separator	Underbar (_)	095
	[18]	Operation mode	0,1,2,3,4 (DMS format)	
	[19]	ON/OFF	0,1	
	[20]	Fan speed	0,1,2,3,4,5	
	[21]	Fan Swing	0,1,2,3	
	[22]	Error	0,1	
	[23]	Separator	Underbar (_)	095
	[24]	setPoint temperate	Second significant digit	
	[25]		First significant digit	
	[26]		First decimal place	
	[27]	Space temperate	Second significant digit	
	[28]		First significant digit	
	[29]		First decimal place	
	[30]	Null padding	0	048

- Samsung LonWorks Gateway Network Variable List

●nvoDigitalOut (3), nviDigitalOut (1)

Description	Digital output status on DMS		
SNVT Type	SNVT_switch : Unsigned/singed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

●nvoDigitalIn (4)

Description	Digital Input status on DMS		
SNVT Type	SNVT_switch : Unsigned/singed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

●nvoSystemLock (5)

Description	System lock status of DMS(only monitoring available)		
SNVT Type	SNVT_switch : Unsigned/singed Short		
Value and operation		Value	State
	Unlock	0.0	0
	Lock	100.0	1

- Samsung LonWorks Gateway Network Variable List

●nvoDMSAlarm (6)

Description	DMS Alarm
SNVT Type	SNVT_str_asc : Unsigned Character Array, 31 bytes
Value and operation	ASCII 4 characters

●nvoSystemAlarm (7)

Description	SIM/PIM Communication Error Code
SNVT Type	SNVT_count : Unsigned Long, 2 bytes
Value and operation	SIM/PIM Communication Error Refer to list of Error code

●nviAllOff (2)

Description	All indoor units turn off
SNVT Type	Enumeration, emerg_t
Value and operation	0 : EMERG_NORMAL 4 : EMERG_SHUTDOWN

- Functional classification by a device

No	NV Name	Remarks	Indoor	ERV	AHU Kit
1	nviOnOff	ON/OFF command	O	O	O
2	nviApplicMode	Setting operating mode	O	X	O
3	nviSetpoint	Setting desirable temperature	O	X	O
4	nviFanStatus	Setting wind speed and direction	O	O	X
5	nviERVMode	Setting ERV operation mode	X	O	X
6	nviFilterReset	Filter reset command	O	O	O
7	nviUserLockout	Setting the restriction of remote control use	O	O	O
8	nviOccOpMode	Setting cooling only mode / Setting heating only mode	O	X	O
9	nviCoolTempLock	Setting the low temperature limit	O	X	O
10	nviHeatTempLock	Setting the high temperature limit	O	X	O
11	nvoSpaceTemp	Display indoor temperature	O	X	O
12	nvoApplicMode	Display operating mode	O	X	O
13	nvoSetpoint	Display desire temperature	O	X	O
14	nvoOnOff	Display ON/OFF status	O	O	O
15	nvoFanStatus	Display wind speed and direction	O	O	X
16	nvoERVMode	Display ERV operating mode	X	O	X
17	nvoErrorCode	Display Error code	O	O	O
18	nvoDeviceAlarm	Remote control Lock, Filter Sign, Thermo ON/OFF, Error occurrence status display	O	O	O
19	nvoOccOpMode	Cooling only/Heating only setup status display	O	X	O
20	nvoCoolTempLock	Low temperature limit setting status display	O	X	O
21	nvoHeatTempLock	High temperature limit setting status display	O	X	O
22	nvoUserLockout	Display the restriction of remote control use	O	O	O
23	nvoEnergyComp	Display electricity usage (Time Period)	O	X	X
24	nvoEnergyCon	Display electricity usage (Basic date)	O	X	X
25	nvoRuntimep	Display used hours (Period)	O	X	O
26	nvoRuntime	Display used hours (Basic date)	O	X	O
27	nvoDevListDesc	The summary of device information (Model, Address, Operation Status)	O	O	O

- Configuration Property

● Send Heartbeat

Menu	Remarks
Definition	This configuration property defines the maximum period of time that expires before the specified network variable outputs will automatically be updated. The associated network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value
Valid Range	The valid range is any value between 0.0 sec and 6,553.4 sec. Setting nciSndHrtBt = 0.0 (default value) disables the Send Heartbeat mechanism.
Recommendations	If required, especially in an event-driven update for monitoring, set a value greater than the default update rate (currently, 10s).
Associate Values	nvoDMSAlarm, nvoSystemAlarm

● Minimum Send Time

Menu	Remarks
Definition	This configuration property defines the minimum period of time between automatic network variable output transmissions. The associated network variable will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value.
Valid Range	The valid range is any value between 0.0 sec and 6,553.4 sec. Setting nciMinOutTm = 0.0 (default value) disables the Minimum Send Time mechanism.
Recommendations	If required, set a value greater than the default update rate (currently, 10s). Any smaller value does not yield a change in the update pattern.
Associate Values	nvoSpaceTemp, nvoSetPoint

- Configuration Property

● Minimum Temperature Change

Menu	Remarks
Definition	This configuration property sets the minimum temperature change required before the associated output network variable is updated. The associate network variable will not be updated unless the change is greater than or equal to the Minimum Temperature Change (nciMinDeltaTemp) configuration value.
Valid Range	The valid range is any value between -273.17°C and 327.66°C. Setting nciMinDeltaTemp = 0.0 (default value) disables the Minimum Temperature Change mechanism.
Recommendations	If required, set a value greater than 0.1 degree in Celsius. Also, consider the maximum of the typical operating range which is 50 degree in Celsius.
Associate Values	nvoSpaceTemp, nvoSetPoint

● Start-Up Delay

Menu	Remarks
Definition	This configuration property controls the minimum period of time that expires before outputs are retransmitted. It also is the minimum amount of elapsed time after a power-up or re-establishment of communications before a control action takes place. This can be used to account for the settle-down time of a network. All of the output network variable will be updated no faster than the Start-Up Delay (nciDelayStartup) configuration value. Also, the heartbeat mechanism will not be enabled unless the elapsed time passes the Start-Up Delay, if used
Valid Range	The valid range is any value between 0.0 sec and 6,553.4 sec. Setting nciDelayStartup = 0.0 disables the Start-Up Delay mechanism.
Recommendations	If required, set a value greater than 1 minute which is a settle-down time of the installed device.
Associate Values	All output network variables