

BACnet Server Software Specifications (Network Object and Variables Specifications)

Model Name

BMS-STBN08E

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1. GENERAL OUTLINE	3
1.1 APPLICABLE AIR CONDITIONER	3
1.2 SYSTEM CONFIGURATION	4
1.3 COMMUNICATION PROTOCOL SPECIFICATION	5
2. OBJECT LIST	6
3. OBJECT INFORMATION	7
3.1 GATEWAY DEVICE	7
3.2 ON / OFF STATUS	10
3.3 OPERATION MODE	11
3.4 FAN SPEED	12
3.5 LOUVER	13
3.6 SET TEMPERATURE	14
3.7 ROOM TEMPERATURE	15
3.8 PERMIT / PROHIBIT OF LOCAL OPERATION	16
3.9 ERROR STATUS	17
3.10 ERROR CODE	18

1. General Outline

This document is applied to the communication specifications of BACnet Server Software (Model Name: BMS-STBN05E).

1.1 Applicable air conditioner

1) VRF System

- Super Modular Multi System
- Super Heat Recovery System
- Mini-SMMS system

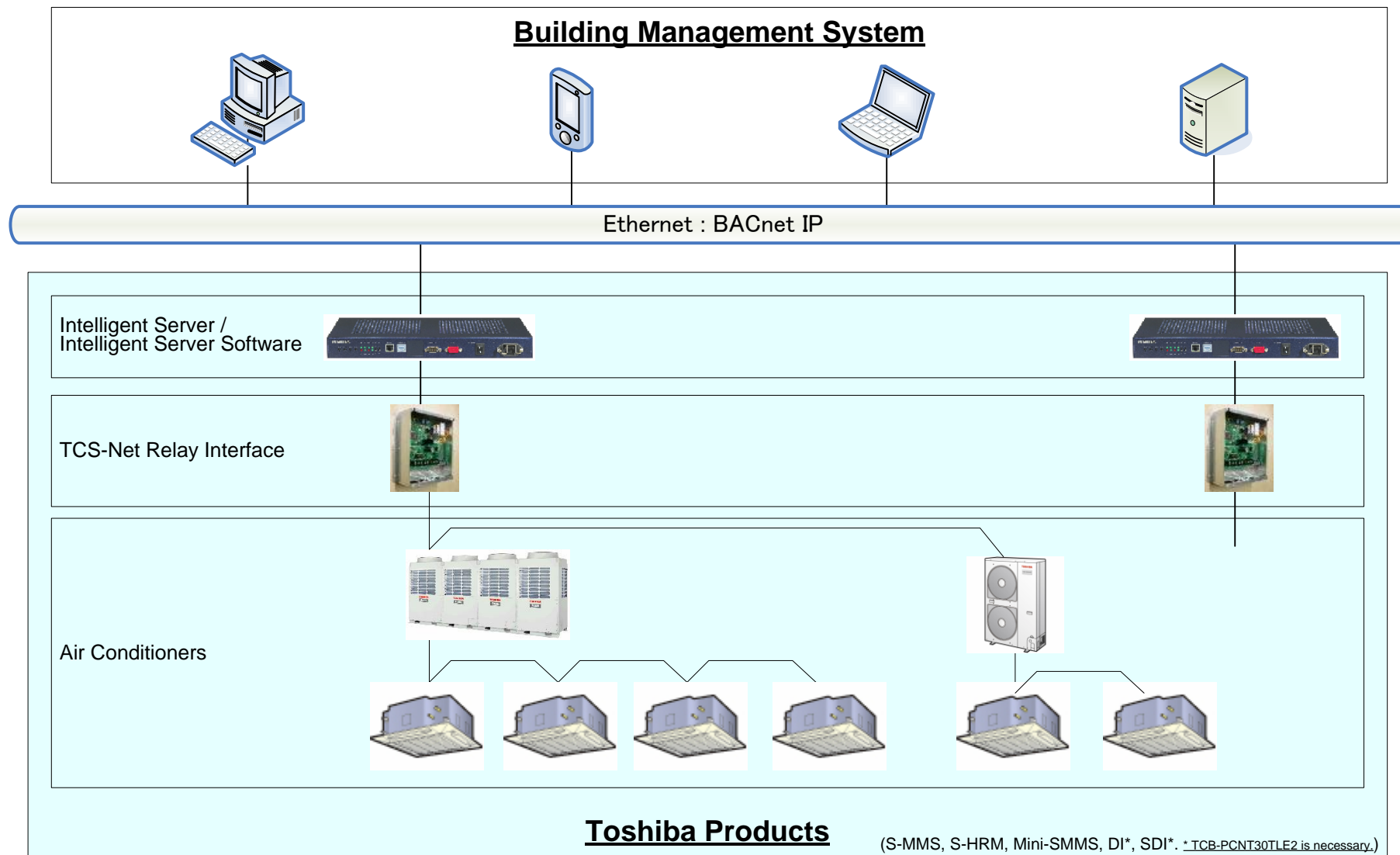
2) Light Commercial model

- Digital Inverter Series(*)
- Super Digital Inverter Series(*)

- (*) - 'Flexi model', 'High wall 0 series' can not applicable.
- TCB-PCNT30TLE2 is necessary except High wall 2Series.

1.2 System Configuration

1.2.1 Sample Control Wiring diagram



1.2.2 System Configuration and Limits

Item	Model Name	Specification	Connectable Q'ty	Note
Intelligent Server	BMS-LSV6E	Hardware for BACnet Software	-	
Intelligent Server Software	BMS-STBN08E	Protocol transformation RS-485 to BACnet IP	One Intelligent Server software per one BACnet Server	
TCS-Net Relay Interface	BMS-IFLSV3E	Protocol transformation TCC-LINK to RS-485	Max. 8 units per one BACnet Server Max. 64 indoor units per one Relay I/F	
Indoor unit			Max. 128 units per one BACnet Server	

2 Communication Protocol Specification

2.1 Protocol Outline

- BACnet/IP
- ANSI/ASHRAE 135-2004
- UDP/IP

2.2 Ethernet Header

- 10BASE-T / 100BASE-T

2.3 IP Header

- Private Address of Class C (except between 192,168,0,0 and 192.168.0.255)
- Subnet Mask 255.255.255.0

2.4 UDP Header

- Unicast / Broadcast
- Port 47808 (0xBAC0)

2.5 BVLL Header

- BVLL Type(One Octet)
- BVLC Function(One Octet)

0x81 (BVLC to BACnet/IP)
 0x0A (Unicast)
 0x0B (Broadcast)

2.6 NPCI

- Version
- Control

0x01
 0x04 (With a response message)
 0x00 (Without a response message)

2.7 APDU

- Based on ANSI/ASHRAE 135-2004

2.8 UDP Header

- The instance number of a Device object
- Segmentation
- APDU which can be received
- Vender ID

This number depend on LSB 1Byte of IP Address
 Transmission and reception are not supported.
 1024 octet
 129 (Toshiba Carrier Corporation)

2.9 Network Options

- BACnet/IP Broadcast Management Device (BBMD) Function
- Registration by Foreign Devices

Not supported
 Not supported

3. Object List

Object Name	Object Type	Object Type (10bit)	Equipment category (4Bit)	Header/Follower ID Number (1Bit)	Equipment Number (1Byte)	Instance Number (1Byte)	Object ID (4Byte)	Value
Gateway Device	Device Object(8)	8	0000	0	0	IP address	0x020000**	
ON/OFF Status	Binary Output Object(4)	4	0000	0/1	FCU(n) 1-128	0x82	0x0100xx82/ 0x0101xx82	Start/Stop
Operation Mode	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x83	0x0040xx83/ 0x0041xx83	Heat/Cool/Fan/Dry/Auto
Fan Speed	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x85	0x0040xx85/ 0x0041xx85	Stop / Auto / HH / H / L / LL
Louver	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x87	0x0040xx87/ 0x0041xx87	Stop /Swing / F1 / F2 / F3 / F4 / F5
Set Temperature	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x84	0x0040xx84/ 0x0041xx84	From 18.0 to 29.0
Room Temperature	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x08	0x0000xx08	From -39.0 To 150.0
Permit / Prohibit of Local Control	Multi-state Output Object(14)	14	0000	0/1	FCU(n) 1-128	0x89	0x0380xx89	- Start/Stop - Operation Mode - Temperature Setting
Error status	Binary Input Object(3)	3	0000	0/1	FCU(n) 1-128	0x40	0x00C0xx40/ 0x00C1xx40	Error / No Error
Error Code	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x01	0x0000xx01/ 0x0001xx01	From 0x00 to 0xFF

4. Object Information

4.1 Gateway Device

Name	Data
Object Type	8
Equipment Category	0000
Equipment Number	0
Instance Number	IP Address
Object Type	Device Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R					Application Tag	object identifire (0xc4)		*** : Instance Number	
							Device object	0x020000**			
Object Name(77)	Character string	R					Application Tag	character string (0x7507)			
							String	"AC_CONTROLLER"			
Object Type(79)	BACnet Object Type	R					Application Tag	enumerated (0x91)		Device(8)	
							Device object	0x08			
System Status(112)	BACnet Device Status	R	*				Application Tag	enumerated (0x91)	Intrinsic reporting		
							value	OPERATIONAL			0x00
								NON_OPERATIONAL			0x04
Vender Name(121)	Character string	R					Application Tag	character string (0x750F)			
							value	Toshiba Carrier Corp.			
Vender Identifier(120)	Unsigned	R					Application Tag	Unsigned(0x21)			
							value	0x07D0			
Model Name(70)	Character string	R					Application Tag	character string			
							value	BMS-STBN08E			
Firmware Revision(44)	Character string	R					Application Tag	character string			
							value	AAC			
Application Software Version(12)	Character string	R					Application Tag	character string			
							value	*.*.*			
Protocol Version(98)	Unsigned	R					Application Tag	Bit string 4Byte			
							value	0x00000001			
Protocol Revision(139)	Unsigned	R					Application Tag	Bit string 4Byte			
							value	0x00000004			

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks	
Protocol Service Supported(97)	BACnet Supported	Service	R				Application Tag			
							Bit string 6Byte			
							First Byte			0x00
							After the second Byte			0x20CBC83CE0
							Service Name			
							AcknowledgementAlarm			N/A
							confirmedCOVNotification			N/A
							confirmedEventNotification			✓
							getAlarmSummary			N/A
							getEnrollmentSummary			N/A
							subscribeCOV			N/A
							atomicReadFile			N/A
							atomicWriteFile			N/A
							addListElement			✓
							removeListElement			✓
							createObject			N/A
							deleteObject			N/A
							readProperty			✓
							readPropertyConditional			N/A
							readPropertyMultiple			✓
							writeProperty			✓
							writePropertyMultiple			✓
							deviceCommunicationControl			✓
							confirmedPrivateTransfer			N/A
							confirmedTextMessage			N/A
							reinitializeDevice			✓
							vtOpen			N/A
							vtClose			N/A
							vtData			N/A
							Aithenticate			N/A
							requestKey			N/A
							i-Am			✓
							i-Have			✓
							unconfirmedCOVnotification			✓
unconfirmedEventNotification	✓									
unconfirmedPrivateTransfer	N/A									
unconfirmedTextMessage	N/A									
timeSynchronization	✓									
Who-Has	✓									
Who-Is	✓									
ReadRange	N/A									
utcTimeSynchronization	N/A									
lifeSafetyOperation	N/A									
subscribeCOVProperty	N/A									
getEventInformation	✓									

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Protocol Object Types Supported(96)	Protocol Object Types Supported	R					Application Tag	Bit string 5Byte			
								First Byte			0x07
								After the second Byte			0xD8870000
								Object Type			
								Analog-input			✓
								Analog-output			✓
								Analog-value			N/A
								Binary-input			✓
								Binary-output			✓
								Binary-value			N/A
								Calendar			N/A
								Command			N/A
								Device			✓
								Event-enrollment			N/A
								file			N/A
								Group			N/A
								Loop			N/A
								Multi-state-input			✓
								Multi-state-output			✓
								Notification-class			✓
								Program			N/A
	Schedule	N/A									
	Average	N/A									
	Multi-state-value	N/A									
	Trend-log	N/A									
	Life-safety-point	N/A									
	Life-safety-zone	N/A									
	Accumulator	N/A									
	Pulse-converter	N/A									
MAX_APDU length Supported(62)	Unsigned	R					Application Tag	Unsigned(0x22)			
							value	1024Byte(0x0400)			
Segmentation Supported(107)	BACnet Segmentation	R					Application Tag	Enumerated(0x91)			
							value	No-segmentation(0x03)			
Local Time(57)	Time	R	*				Application Tag	Time(0xB4)			
							value	Hour, Minute, Second, a hundredth of a second is "0"			
Local Date(56)	Date	R	*				Application Tag	Date(0xA4)			
							value	Year, Month, Day, a day of the week			
APDU Timeout(11)	Unsigned2	R					Application Tag	Unsigned1(0x22)			
							value	60000msec(0xEA60)			
Number of APDU Retries(73)	Unsigned	R					Application Tag	Unsigned1(0x21)			
							value	0x00			

4.2 ON / OFF status

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x82
Object Type	Binary Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0100**82		
Object Name(77)	character string	R					Application Tag	character string (0x7513)		
							String	“-“		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Binary Output(4)
							analog input object	0x04		
Present value(85)	BACnetBinaryPV	W	*			0x91	Application Tag	enumerated (0x91)	COV	
							Value	INACTIVE		
								ACTIVE	0x01	

4.3 Operation mode

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x83
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**83			
Object Name(77)	character string	R					Application Tag	character string (0x7511)			
							String	“-“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	Real	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	Heating			1.0
								Cooling			2.0
								Fan			3.0
								Dry			4.0
								Auto			5.0

4.4 Fan Speed

Name	Data
Object Type	14
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x85
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**85			
Object Name(77)	character string	R					Application Tag	character string (0x7506)			
							String	“_”			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	Real	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	Stop			1.0
								Auto			2.0
								HH			3.0
								H			4.0
								L			5.0
								LL			6.0

4.5 Louver

Name	Data
Object Type	14
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x87
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**87			
Object Name(77)	character string	R					Application Tag	character string (0x7507)			
							String	“-“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	SWING			1.0
								F1			2.0
								F2			3.0
								F3			4.0
								F4			5.0
								F5			6.0
								Stop			7.0

4.6 Set temperature

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x84
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0040**84		
Object Name(77)	character string	R					Application Tag	character string (0x750E)		
							String	“_”		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		
							analog output object	0x01		
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag	Real (0x44)	COV	
							Value	From 18.0 to 29.0		

4.7 Room temperature

Name	Data
Object Type	0
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x08
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0000**08		
Object Name(77)	character string	R					Application Tag	character string (0x7513)		
							String	“_”		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		ANALOG_INPUT(0)
							analog input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real(0x44)		When is normal, the value is '0.0'.
							Value	From -39.0 to 150.0		

4.8 Permit / Prohibit of Local Operation

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x89
Object Type	Multi-state Output Object(14)

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value				Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)					*** : air conditioning number 0x01 – 0x80
							binary input object	0x0380**89					
Object Name(77)	character string	R					Application Tag	character string (0x750f)					
							String	“-“					
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)					Binary Input(3)
							binary input object	0x03					
Present value(85)	BACnetBinaryPV	W	*			0x21	Application Tag	enumerated (0x91)				intrinsic reporting	
							Value	Prohibition					
								Mode	Temp	ON/OFF	Data		
								-	-	-	0x01		
								✓	-	-	0x02		
								-	✓	-	0x03		
								-	-	✓	0x04		
								✓	✓	-	0x05		
								✓	-	✓	0x06		
								-	✓	✓	0x07		
✓	✓	✓	0x08										

4.9 Error status

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x40
Object Type	Binary Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x00C0**40			
Object Name(77)	character string	R					Application Tag	character string (0x750f)			
							String	“-“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Binary Input(3)	
							binary input object	0x03			
Present value(85)	BACnetBinaryPV	R	*			0x91	Application Tag	enumerated (0x91)	intrinsic reporting	Error Code : please refer to ‘2.9 Indoor unit Error Code’.	
							Value	No Error			0x00
								Error			0x01

4.10 Error Code

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x01
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0000**01		
Object Name(77)	character string	R					Application Tag	character string (0x7514)		
							String	“-“		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Analog Input(0)
							binary input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real(0x44)		When is No Error, the value is '0x00'.
							Value	From 0x00 to 0xFF		