BACnet Master

Datasheet

A-BNM-B

A-BNM-P

A-BNM-M

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1. PREFACE

1.1. ABOUT THIS DOCUMENT

This document contains the technical data for the BACnet Master.

1.2. INTRODUCTION TO THE BACNET MASTER

The BACnet Master provides flexible integration between BACnet devices and EtherNet/IP and Modbus (Modbus-RTU232, Modbus-RTU485, and Ethernet Modbus-TCP) devices.

Communication with BACnet devices can be via Ethernet (BACnet/IP and BACnet/Ethernet) and RS485 (BACnet MS/TP).

The BACnet Master allows the user to integrate Modbus devices into a Rockwell Automation Logix platform (ControlLogix or CompactLogix).

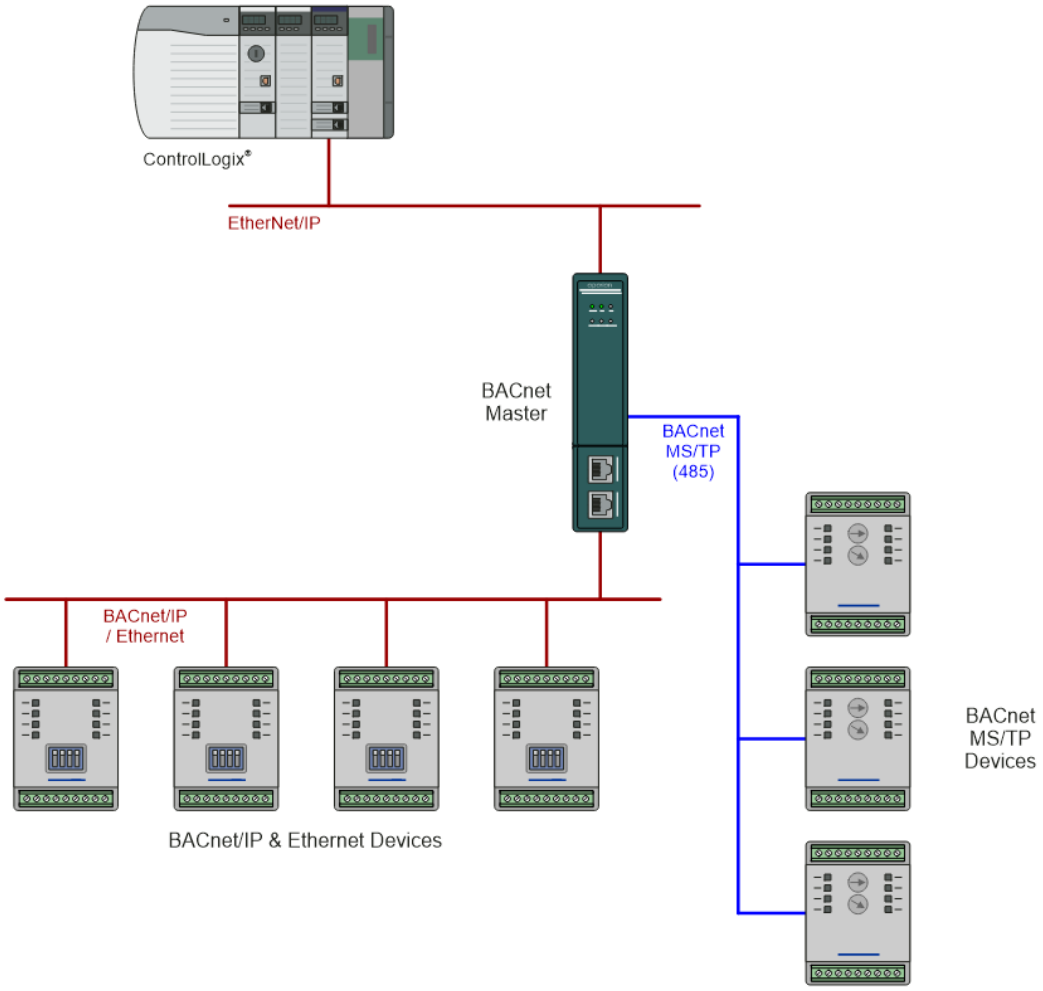

Figure 1.1. – BACnet System

Primary Interface:

The module can operate in one of four Primary Interface modes:

EtherNet/IP Target
Here a remote EtherNet/IP device (e.g. a Logix controller) establishes a number of Class 1 connections to the module. BACnet data can be mapped into a maximum of 25 separate input and output class 1 cyclic connections to the Logix controller (allowing up to 12KB input and 12KB output to be exchanged at the requested packet interval – RPI).

EtherNet/IP Originator
As an EtherNet/IP originator, the BACnet master can use one of three methods to exchange data:

- **EtherNet/IP Explicit Messaging**

  Here the BACnet master exchanges data with up to 10 EtherNet/IP devices using explicit messaging. The module can use either Class 3 or Unconnected Messaging (UCMM) to Get and Set data in the remote EtherNet/IP devices.

- **Direct-To-Tag technology**

  Here the BACnet master exchanges data with a Logix controller without the need to write any application code (e.g. ladder) in Studio 5000. The BACnet data is directly read from, or written to, Logix tags.

- **EtherNet/IP Class 1 connection**

  BACnet data can be mapped to a maximum of 10 EtherNet/IP devices using input and output class 1 cyclic connections. This will allow the BACnet Master to "own" the EtherNet/IP target device and exchange BACnet device data using the EtherNet/IP device's input and output assemblies.

Modbus Server
As a Modbus Server, the BACnet data will be written to, or read from, the module's internal Modbus Registers (Holding or Input Registers). These registers can be accessed by a remote Modbus Client using Modbus TCP, RTU232, and RT485.

Modbus Client
As a Modbus Client, the BACnet data will be written to, or read from, the module's internal Modbus Registers (Holding or Input Registers). The Modbus Auxiliary Map can then be used to configure the Modbus data exchange between multiple remote Modbus Server devices and the module's internal Modbus registers via Modbus TCP, RTU232, and RT485.

The BACnet Master is configured using the Aparian Slate application. This program can be downloaded from www.aparian.com free of charge.

The module also provides a range of statistics, BACnet and Modbus packet capture functions, and internal Modbus and Data table reads to simplify the diagnostic process for remote diagnosis. The module has two Ethernet ports and supports Device-Level-Ring (DLR) architectures.

1.3. FEATURES

- Support up to:
  - 200 BACnet data points with 50 BACnet devices (A-BNM-B)
  - 1000 BACnet data points with 250 BACnet devices (A-BNM-P)
  - 2500 BACnet data points with 250 BACnet devices (A-BNM-M)
- Supports up to 250 BACnet devices.
- Support up to 256 Properties per BACnet device.
- Supports BACnet communication on Ethernet and RS485.
- Logix L5X generation - Ready for import
- Supports Passthrough Messaging from Logix
- Module has various Primary Interfaces:
  - EtherNet/IP Target (Class 1 connection)
  - Modbus Server (TCP, RTU232, and RTU485)
  - Modbus Client (TCP, RTU232, and RTU485)
  - EtherNet/IP Originator (Class 1 connection with up to 10 EtherNet/IP devices and Explicit Messaging, including Direct-To-Tag Logix tag access, with up to 10 EtherNet/IP devices).
- Slate software provides a BACnet and Modbus packet capture utility for better diagnosis of communication issues.
- Dual Ethernet ports which support Device-Level-Ring (DLR).
- Network Time Protocol (NTP) supported for external time synchronization.
- Small form factor – DIN rail mounted.

The security services provide the following features:

- Configurable level of security
- Encrypted EtherNet/IP communication
- Fixed User Roles and Custom Users
- Configurable Password rules
- Login Expiry
- Failed Login Cool-off and Account Disable options
- Configurable Global Services and Custom Ports
- Optional IP Address Access Control List
- Optional MAC Access Control List
- Restrictions on Reset commands
- Restrictions on Device Flash options
- Security Audit trail in Event Log

1.4. ARCHITECTURE

The figures below provide an example of the typical network setup for connecting BACnet devices to either EtherNet/IP or Modbus TCP.

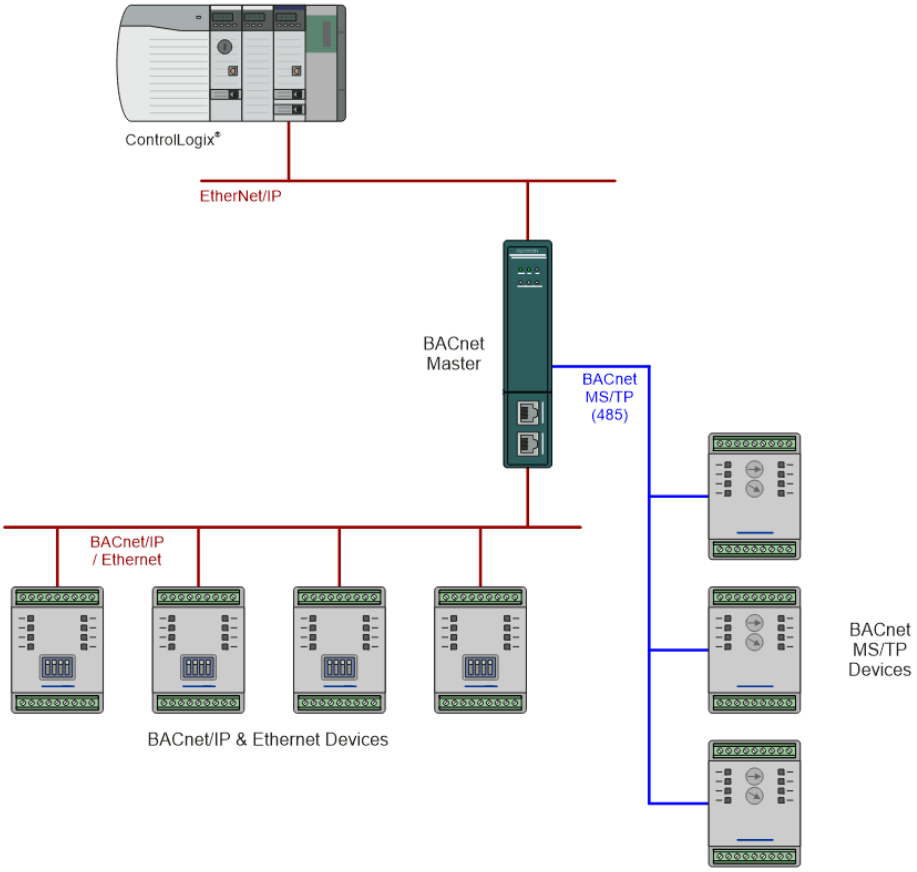

Figure 1.2. – Example of connecting to a Logix Controller

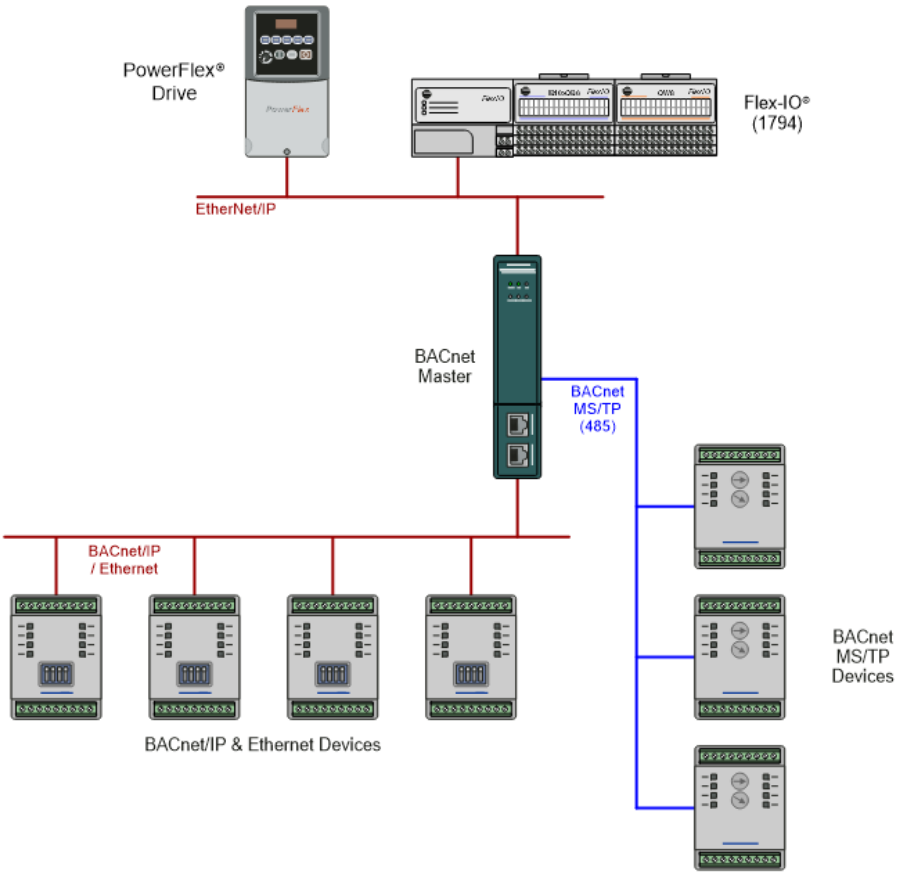

Figure 1.3. – Example of connecting EtherNet/IP I/O

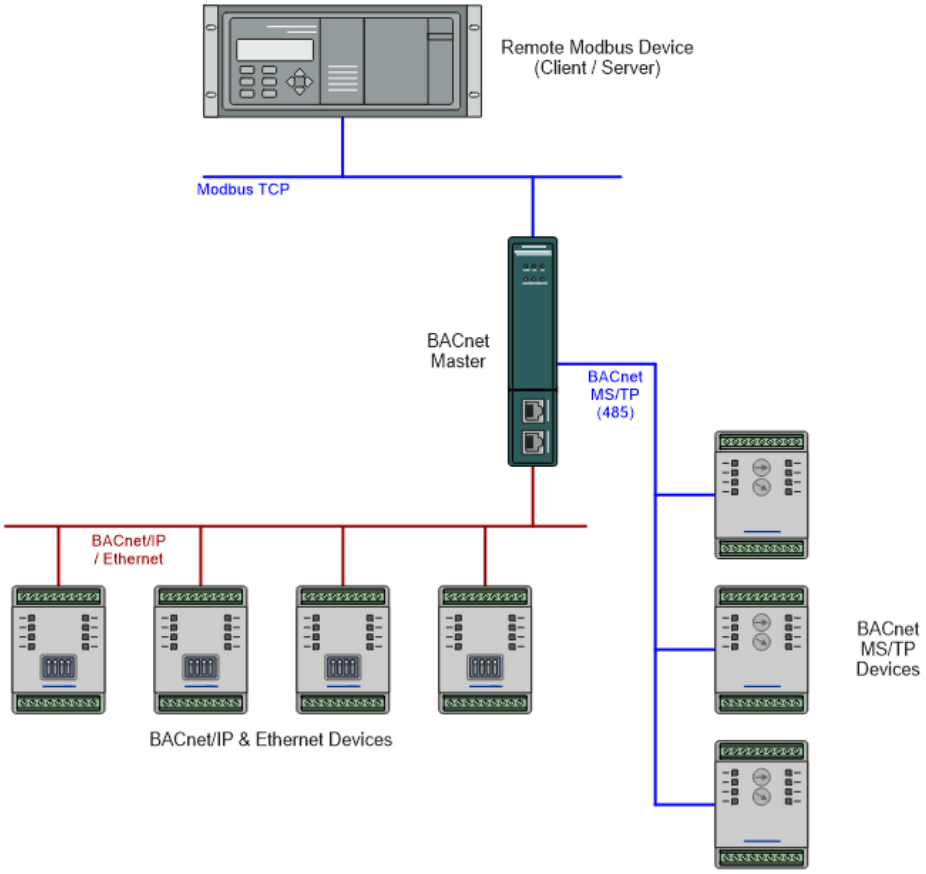

Figure 1.4. - Example of connecting to a Modbus TCP Client or Server

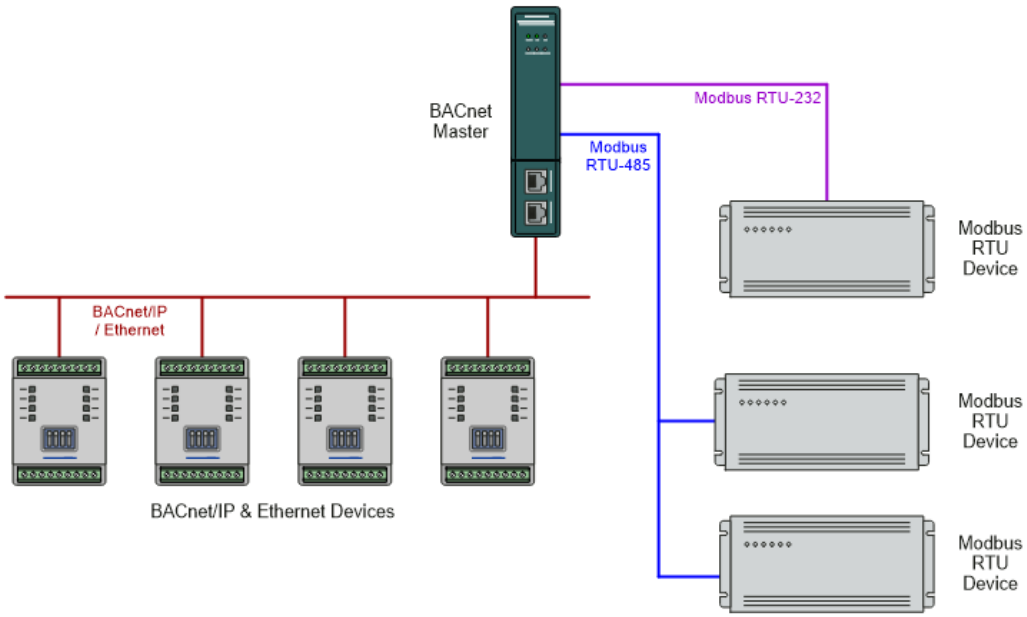

Figure 1.5. - Example of connecting to a Modbus RTU Client or Server

1.5. ADDITIONAL INFORMATION

The following documents contain additional information that can assist the user with the module installation and operation.

Resource	Link
Slate Installation	http://www.aparian.com/software/slate
BACnet Master User Manual BACnet Master Datasheet Example Code & UDTs	https://www.aparian.com/products/BACnetMaster
Ethernet wiring standard	www.cisco.com/c/en/us/td/docs/video/cds/cde/cde205_220_420/installation/guide/cde205_220_420_hig/Connectors.html

Table 1.1. - Additional Information

1.6. SUPPORT

Technical support is provided via the Web (in the form of user manuals, FAQ, datasheets etc.) to assist with installation, operation, and diagnostics.

For additional support the user can use either of the following:

Resource	Link
Contact Us web link	https://aparian.com/aparian-tech-support-request
Support email	support@aparian.com

Table 1.2. – Support Details

2. BACNET OBJECT PROPERTIES

2.1. SUPPORTED BACNET OBJECTS

The following BACnet objects are supported.

Object	*Object Name*
AI	Analog Input
AO	Analog Output
AV	Analog Value
BI	Binary Input
BO	Binary Output
BV	Binary Value
DV	Device
GR	Group
LSP	Life Safety Point
MI	Multi-State Input
MO	Multi-State Output
MV	Multi-State Value

Table 2.1 – Supported BACnet Objects

2.2. SUPPORTED BACNET OBJECT PROPERTIES

The following BACnet properties are supported for each BACnet object:

Object	*Property Name*	*BACnet Data Type*
ANALOG INPUT		
AI	AckedTransitions	BACnetEventTransitionBits
AI	CovIncrement	Real
AI	Deadband	Real
AI	Description	CharacterString
AI	DeviceType	CharacterString
AI	EventAlgorithmInhibit	Boolean
AI	EventDetectionEnable	Boolean
AI	EventEnable	BACnetEventTransitionBits
AI	EventMessageTexts	CharacterString
AI	EventMessageTextsConfig	CharacterString
AI	EventState	BACnetEventState
AI	EventTimeStamps	BACnetTimeStamp
AI	FaultHighLimit	Real
AI	FaultLowLimit	Real

Object	*Property Name*	*BACnet Data Type*
AI	HighLimit	Real
AI	InterfaceValue	BACnetOptionalREAL
AI	LimitEnable	BACnetLimitEnable
AI	LowLimit	Real
AI	MaxPresValue	Real
AI	MinPresValue	Real
AI	NotificationClass	Unsigned
AI	NotifyType	BACnetNotifyType
AI	ObjectIdentifier	BACnetObjectIdentifier
AI	ObjectName	CharacterString
AI	ObjectType	BACnetObjectType
AI	OutOfService	Boolean
AI	PresentValue	Real
AI	ProfileLocation	CharacterString
AI	ProfileName	CharacterString
AI	PropertyList	BACnetPropertyIdentifier
AI	ReliabilityEvaluationInhibit	Boolean
AI	Resolution	Real
AI	StatusFlags	BACnetStatusFlags
AI	Tags	BACnetNameValue
AI	TimeDelay	Unsigned
AI	TimeDelayNormal	Unsigned
AI	Units	BACnetEngineeringUnits
AI	UpdateInterval	Unsigned
ANALOG OUTPUT		
AO	AckedTransitions	BACnetEventTransitionBits
AO	CommandTimeArray	BACnetTimeStamp
AO	CovIncrement	Real
AO	CurrentCommandPriority	BACnetOptionalUnsigned
AO	Deadband	Real
AO	Description	CharacterString
AO	DeviceType	CharacterString
AO	EventAlgorithmInhibit	Boolean
AO	EventDetectionEnable	Boolean
AO	EventEnable	BACnetEventTransitionBits
AO	EventMessageTexts	CharacterString
AO	EventMessageTextsConfig	CharacterString
AO	EventState	BACnetEventState
AO	EventTimeStamps	BACnetTimeStamp
AO	HighLimit	Real
AO	InterfaceValue	BACnetOptionalREAL
AO	LastCommandTime	BACnetTimeStamp
AO	LimitEnable	BACnetLimitEnable
AO	LowLimit	Real
AO	MaxPresValue	Real
AO	MinPresValue	Real

Object	*Property Name*	*BACnet Data Type*
AO	NotificationClass	Unsigned
AO	NotifyType	BACnetNotifyType
AO	ObjectIdentifier	BACnetObjectIdentifier
AO	ObjectName	CharacterString
AO	ObjectType	BACnetObjectType
AO	OutOfService	Boolean
AO	PresentValue	Real
AO	ProfileLocation	CharacterString
AO	ProfileName	CharacterString
AO	PropertyList	BACnetPropertyIdentifier
AO	Reliability	BACnetReliability
AO	ReliabilityEvaluationInhibit	Boolean
AO	RelinquishDefault	Real
AO	Resolution	Real
AO	StatusFlags	BACnetStatusFlags
AO	Tags	BACnetNameValue
AO	TimeDelay	Unsigned
AO	TimeDelayNormal	Unsigned
AO	Units	BACnetEngineeringUnits
ANALOG VALUE		
AV	AckedTransitions	BACnetEventTransitionBits
AV	CommandTimeArray	BACnetTimeStamp
AV	CovIncrement	Real
AV	CurrentCommandPriority	BACnetOptionalUnsigned
AV	Deadband	Real
AV	Description	CharacterString
AV	EventAlgorithmInhibit	Boolean
AV	EventDetectionEnable	Boolean
AV	EventEnable	BACnetEventTransitionBits
AV	EventMessageTexts	CharacterString
AV	EventMessageTextsConfig	CharacterString
AV	EventState	BACnetEventState
AV	EventTimeStamps	BACnetTimeStamp
AV	FaultHighLimit	Real
AV	FaultLowLimit	Real
AV	HighLimit	Real
AV	LastCommandTime	BACnetTimeStamp
AV	LimitEnable	BACnetLimitEnable
AV	LowLimit	Real
AV	MaxPresValue	Real
AV	MinPresValue	Real
AV	NotificationClass	Unsigned
AV	NotifyType	BACnetNotifyType
AV	ObjectIdentifier	BACnetObjectIdentifier
AV	ObjectName	CharacterString
AV	ObjectType	BACnetObjectType

Object	*Property Name*	*BACnet Data Type*
AV	OutOfService	Boolean
AV	PresentValue	Real
AV	ProfileLocation	CharacterString
AV	ProfileName	CharacterString
AV	PropertyList	BACnetPropertyIdentifier
AV	Reliability	BACnetReliability
AV	ReliabilityEvaluationInhibit	Boolean
AV	RelinquishDefault	Real
AV	Resolution	Real
AV	StatusFlags	BACnetStatusFlags
AV	Tags	BACnetNameValue
AV	TimeDelay	Unsigned
AV	TimeDelayNormal	Unsigned
AV	Units	BACnetEngineeringUnits
BINARY INPUT		
BI	AckedTransitions	BACnetEventTransitionBits
BI	ActiveText	CharacterString
BI	AlarmValue	BACnetBinaryPV
BI	ChangeOfStateCount	Unsigned
BI	ChangeOfStateTime	BACnetDateTime
BI	Description	CharacterString
BI	DeviceType	CharacterString
BI	ElapsedActiveTime	Unsigned32
BI	EventAlgorithmInhibit	Boolean
BI	EventDetectionEnable	Boolean
BI	EventEnable	BACnetEventTransitionBits
BI	EventMessageTexts	CharacterString
BI	EventMessageTextsConfig	CharacterString
BI	EventState	BACnetEventState
BI	EventTimeStamps	BACnetTimeStamp
BI	InactiveText	CharacterString
BI	InterfaceValue	BACnetOptionalBinaryPV
BI	NotificationClass	Unsigned
BI	NotifyType	BACnetNotifyType
BI	ObjectIdentifier	BACnetObjectIdentifier
BI	ObjectName	CharacterString
BI	ObjectType	BACnetObjectType
BI	OutOfService	Boolean
BI	Polarity	BACnetPolarity
BI	PresentValue	BACnetBinaryPV
BI	ProfileLocation	CharacterString
BI	ProfileName	CharacterString
BI	PropertyList	BACnetPropertyIdentifier
BI	Reliability	BACnetReliability
BI	ReliabilityEvaluationInhibit	Boolean
BI	StatusFlags	BACnetStatusFlags

Object	*Property Name*	*BACnet Data Type*
BI	Tags	BACnetNameValue
BI	TimeDelay	Unsigned
BI	TimeDelayNormal	Unsigned
BI	TimeOfActiveTimeReset	BACnetDateTime
BI	TimeOfStateCountReset	BACnetDateTime
BINARY OUTPUT		
BO	AckedTransitions	BACnetEventTransitionBits
BO	ActiveText	CharacterString
BO	ChangeOfStateCount	Unsigned
BO	ChangeOfStateTime	BACnetDateTime
BO	CommandTimeArray	BACnetTimeStamp
BO	CurrentCommandPriority	BACnetOptionalUnsigned
BO	Description	CharacterString
BO	DeviceType	CharacterString
BO	ElapsedActiveTime	Unsigned32
BO	EventAlgorithmInhibit	Boolean
BO	EventDetectionEnable	Boolean
BO	EventEnable	BACnetEventTransitionBits
BO	EventMessageTexts	CharacterString
BO	EventMessageTextsConfig	CharacterString
BO	EventState	BACnetEventState
BO	EventTimeStamps	BACnetTimeStamp
BO	FeedbackValue	BACnetBinaryPV
BO	InactiveText	CharacterString
BO	InterfaceValue	BACnetOptionalBinaryPV
BO	LastCommandTime	BACnetTimeStamp
BO	MinimumOffTime	Unsigned32
BO	MinimumOnTime	Unsigned32
BO	NotificationClass	Unsigned
BO	NotifyType	BACnetNotifyType
BO	ObjectIdentifier	BACnetObjectIdentifier
BO	ObjectName	CharacterString
BO	ObjectType	BACnetObjectType
BO	OutOfService	Boolean
BO	Polarity	BACnetPolarity
BO	PresentValue	BACnetBinaryPV
BO	ProfileLocation	CharacterString
BO	ProfileName	CharacterString
BO	PropertyList	BACnetPropertyIdentifier
BO	Reliability	BACnetReliability
BO	ReliabilityEvaluationInhibit	Boolean
BO	RelinquishDefault	BACnetBinaryPV
BO	StatusFlags	BACnetStatusFlags
BO	Tags	BACnetNameValue
BO	TimeDelay	Unsigned
BO	TimeDelayNormal	Unsigned

Object	*Property Name*	*BACnet Data Type*
BO	TimeOfActiveTimeReset	BACnetDateTime
BO	TimeOfStateCountReset	BACnetDateTime
BINARY VALUE		
BV	AckedTransitions	BACnetEventTransitionBits
BV	ActiveText	CharacterString
BV	AlarmValue	BACnetBinaryPV
BV	ChangeOfStateCount	Unsigned
BV	ChangeOfStateTime	BACnetDateTime
BV	CommandTimeArray	BACnetTimeStamp
BV	CurrentCommandPriority	BACnetOptionalUnsigned
BV	Description	CharacterString
BV	ElapsedActiveTime	Unsigned32
BV	EventAlgorithmInhibit	Boolean
BV	EventDetectionEnable	Boolean
BV	EventEnable	BACnetEventTransitionBits
BV	EventMessageTexts	CharacterString
BV	EventMessageTextsConfig	CharacterString
BV	EventState	BACnetEventState
BV	EventTimeStamps	BACnetTimeStamp
BV	InactiveText	CharacterString
BV	LastCommandTime	BACnetTimeStamp
BV	MinimumOffTime	Unsigned32
BV	MinimumOnTime	Unsigned32
BV	NotificationClass	Unsigned
BV	NotifyType	BACnetNotifyType
BV	ObjectIdentifier	BACnetObjectIdentifier
BV	ObjectName	CharacterString
BV	ObjectType	BACnetObjectType
BV	OutOfService	Boolean
BV	PresentValue	BACnetBinaryPV
BV	ProfileLocation	CharacterString
BV	ProfileName	CharacterString
BV	PropertyList	BACnetPropertyIdentifier
BV	Reliability	BACnetReliability
BV	ReliabilityEvaluationInhibit	Boolean
BV	RelinquishDefault	BACnetBinaryPV
BV	StatusFlags	BACnetStatusFlags
BV	Tags	BACnetNameValue
BV	TimeDelay	Unsigned
BV	TimeDelayNormal	Unsigned
BV	TimeOfActiveTimeReset	BACnetDateTime
BV	TimeOfStateCountReset	BACnetDateTime
DEVICE		
DV	AckedTransitions	BACnetEventTransitionBits

Object	*Property Name*	*BACnet Data Type*
DV	AlignIntervals	Boolean
DV	ApduSegmentTimeout	Unsigned
DV	ApduTimeout	Unsigned
DV	ApplicationSoftwareVersion	CharacterString
DV	BackupAndRestoreState	BACnetBackupState
DV	BackupFailureTimeout	Unsigned16
DV	BackupPreparationTime	Unsigned16
DV	ConfigurationFiles	BACnetObjectIdentifier
DV	DatabaseRevision	Unsigned
DV	DaylightSavingsStatus	Boolean
DV	DeployedProfileLocation	CharacterString
DV	Description	CharacterString
DV	EventDetectionEnable	Boolean
DV	EventEnable	BACnetEventTransitionBits
DV	EventMessageTexts	CharacterString
DV	EventMessageTextsConfig	CharacterString
DV	EventState	BACnetEventState
DV	EventTimeStamps	BACnetTimeStamp
DV	FirmwareRevision	CharacterString
DV	IntervalOffset	Unsigned
DV	LastRestartReason	BACnetRestartReason
DV	LastRestoreTime	BACnetTimeStamp
DV	LocalDate	Date
DV	LocalTime	Time
DV	Location	CharacterString
DV	MaxApduLengthAccepted	Unsigned
DV	MaxInfoFrames	Unsigned
DV	MaxMaster	Unsigned
DV	MaxSegmentsAccepted	Unsigned
DV	ModelName	CharacterString
DV	NotificationClass	Unsigned
DV	NotifyType	BACnetNotifyType
DV	NumberOfApduRetries	Unsigned
DV	ObjectIdentifier	BACnetObjectIdentifier
DV	ObjectList	BACnetObjectIdentifier
DV	ObjectName	CharacterString
DV	ObjectType	BACnetObjectType
DV	ProfileLocation	CharacterString
DV	ProfileName	CharacterString
DV	PropertyList	BACnetPropertyIdentifier
DV	ProtocolObjectTypesSupported	BACnetObjectTypesSupported
DV	ProtocolRevision	Unsigned
DV	ProtocolServicesSupported	BACnetServicesSupported
DV	ProtocolVersion	Unsigned
DV	Reliability	BACnetReliability
DV	ReliabilityEvaluationInhibit	Boolean
DV	RestoreCompletionTime	Unsigned16

Object	*Property Name*	*BACnet Data Type*
DV	RestorePreparationTime	Unsigned16
DV	SegmentationSupported	BACnetSegmentation
DV	SerialNumber	CharacterString
DV	StatusFlags	BACnetStatusFlags
DV	StructuredObjectList	BACnetObjectIdentifier
DV	SystemStatus	BACnetDeviceStatus
DV	Tags	BACnetNameValue
DV	TimeOfDeviceRestart	BACnetTimeStamp
DV	TimeSynchronizationInterval	Unsigned
DV	UtcOffset	Integer
DV	VendorIdentifier	Unsigned16
DV	VendorName	CharacterString
DV	VtClassesSupported	BACnetVTClass
GROUP		
GR	Description	CharacterString
GR	ObjectIdentifier	BACnetObjectIdentifier
GR	ObjectName	CharacterString
GR	ObjectType	BACnetObjectType
GR	PresentValue	ReadAccessResult
GR	ProfileLocation	CharacterString
GR	ProfileName	CharacterString
GR	PropertyList	BACnetPropertyIdentifier
GR	Tags	BACnetNameValue
MULTI-STATE INPUT		
MI	AckedTransitions	BACnetEventTransitionBits
MI	AlarmValues	Unsigned
MI	Description	CharacterString
MI	DeviceType	CharacterString
MI	EventAlgorithmInhibit	Boolean
MI	EventDetectionEnable	Boolean
MI	EventEnable	BACnetEventTransitionBits
MI	EventMessageTexts	CharacterString
MI	EventMessageTextsConfig	CharacterString
MI	EventState	BACnetEventState
MI	EventTimeStamps	BACnetTimeStamp
MI	FaultValues	Unsigned
MI	InterfaceValue	BACnetOptionalUnsigned
MI	NotificationClass	Unsigned
MI	NotifyType	BACnetNotifyType
MI	NumberOfStates	Unsigned
MI	ObjectIdentifier	BACnetObjectIdentifier
MI	ObjectName	CharacterString
MI	ObjectType	BACnetObjectType
MI	OutOfService	Boolean

Object	*Property Name*	*BACnet Data Type*
MI	PresentValue	Unsigned
MI	ProfileLocation	CharacterString
MI	ProfileName	CharacterString
MI	PropertyList	BACnetPropertyIdentifier
MI	Reliability	BACnetReliability
MI	ReliabilityEvaluationInhibit	Boolean
MI	StateText	CharacterString
MI	StatusFlags	BACnetStatusFlags
MI	Tags	BACnetNameValue
MI	TimeDelay	Unsigned
MI	TimeDelayNormal	Unsigned
MULTI-STATE OUTPUT		
MO	AckedTransitions	BACnetEventTransitionBits
MO	CommandTimeArray	BACnetTimeStamp
MO	CurrentCommandPriority	BACnetOptionalUnsigned
MO	Description	CharacterString
MO	DeviceType	CharacterString
MO	EventAlgorithmInhibit	Boolean
MO	EventDetectionEnable	Boolean
MO	EventEnable	BACnetEventTransitionBits
MO	EventMessageTexts	CharacterString
MO	EventMessageTextsConfig	CharacterString
MO	EventState	BACnetEventState
MO	EventTimeStamps	BACnetTimeStamp
MO	FeedbackValue	Unsigned
MO	InterfaceValue	BACnetOptionalUnsigned
MO	LastCommandTime	BACnetTimeStamp
MO	NotificationClass	Unsigned
MO	NotifyType	BACnetNotifyType
MO	NumberOfStates	Unsigned
MO	ObjectIdentifier	BACnetObjectIdentifier
MO	ObjectName	CharacterString
MO	ObjectType	BACnetObjectType
MO	OutOfService	Boolean
MO	PresentValue	Unsigned
MO	ProfileLocation	CharacterString
MO	ProfileName	CharacterString
MO	PropertyList	BACnetPropertyIdentifier
MO	Reliability	BACnetReliability
MO	ReliabilityEvaluationInhibit	Boolean
MO	RelinquishDefault	Unsigned
MO	StateText	CharacterString
MO	StatusFlags	BACnetStatusFlags
MO	Tags	BACnetNameValue
MO	TimeDelay	Unsigned
MO	TimeDelayNormal	Unsigned

Object	*Property Name*	*BACnet Data Type*
MULTI-STATE VALUE		
MV	AckedTransitions	BACnetEventTransitionBits
MV	AlarmValues	Unsigned
MV	CommandTimeArray	BACnetTimeStamp
MV	CurrentCommandPriority	BACnetOptionalUnsigned
MV	Description	CharacterString
MV	EventAlgorithmInhibit	Boolean
MV	EventDetectionEnable	Boolean
MV	EventEnable	BACnetEventTransitionBits
MV	EventMessageTexts	CharacterString
MV	EventMessageTextsConfig	CharacterString
MV	EventState	BACnetEventState
MV	EventTimeStamps	BACnetTimeStamp
MV	FaultValues	Unsigned
MV	LastCommandTime	BACnetTimeStamp
MV	NotificationClass	Unsigned
MV	NotifyType	BACnetNotifyType
MV	NumberOfStates	Unsigned
MV	ObjectIdentifier	BACnetObjectIdentifier
MV	ObjectName	CharacterString
MV	ObjectType	BACnetObjectType
MV	OutOfService	Boolean
MV	PresentValue	Unsigned
MV	ProfileLocation	CharacterString
MV	ProfileName	CharacterString
MV	PropertyList	BACnetPropertyIdentifier
MV	Reliability	BACnetReliability
MV	ReliabilityEvaluationInhibit	Boolean
MV	RelinquishDefault	Unsigned
MV	StateText	CharacterString
MV	StatusFlags	BACnetStatusFlags
MV	Tags	BACnetNameValue
MV	TimeDelay	Unsigned
MV	TimeDelayNormal	Unsigned
LIFE SAFETY POINT		
LSP	AcceptedModes	BACnetLifeSafetyMode
LSP	AckedTransitions	BACnetEventTransitionBits
LSP	AlarmValues	BACnetLifeSafetyState
LSP	Description	CharacterString
LSP	DeviceType	CharacterString
LSP	DirectReading	Real
LSP	EventAlgorithmInhibit	Boolean
LSP	EventDetectionEnable	Boolean
LSP	EventEnable	BACnetEventTransitionBits

Object	*Property Name*	*BACnet Data Type*
LSP	EventMessageTexts	CharacterString
LSP	EventMessageTextsConfig	CharacterString
LSP	EventState	BACnetEventState
LSP	EventTimeStamps	BACnetTimeStamp
LSP	FaultValues	BACnetLifeSafetyState
LSP	LifeSafetyAlarmValues	BACnetLifeSafetyState
LSP	MaintenanceRequired	BACnetMaintenance
LSP	MemberOf	BACnetDeviceObjectReference
LSP	Mode	BACnetLifeSafetyMode
LSP	NotificationClass	Unsigned
LSP	NotifyType	BACnetNotifyType
LSP	ObjectIdentifier	BACnetObjectIdentifier
LSP	ObjectName	CharacterString
LSP	ObjectType	BACnetObjectType
LSP	OperationExpected	BACnetLifeSafetyOperation
LSP	OutOfService	Boolean
LSP	PresentValue	BACnetLifeSafetyState
LSP	ProfileLocation	CharacterString
LSP	ProfileName	CharacterString
LSP	PropertyList	BACnetPropertyIdentifier
LSP	Reliability	BACnetReliability
LSP	ReliabilityEvaluationInhibit	Boolean
LSP	Setting	Unsigned8
LSP	Silenced	BACnetSilencedState
LSP	StatusFlags	BACnetStatusFlags
LSP	Tags	BACnetNameValue
LSP	TimeDelay	Unsigned
LSP	TimeDelayNormal	Unsigned
LSP	TrackingValue	BACnetLifeSafetyState
LSP	Units	BACnetEngineeringUnits

Table 2.2 – Supported BACnet Object Properties

3. TECHNICAL SPECIFICATIONS

3.1. DIMENSIONS

Below are the enclosure dimensions as well as the required DIN rail dimensions. All dimensions are in millimeters.

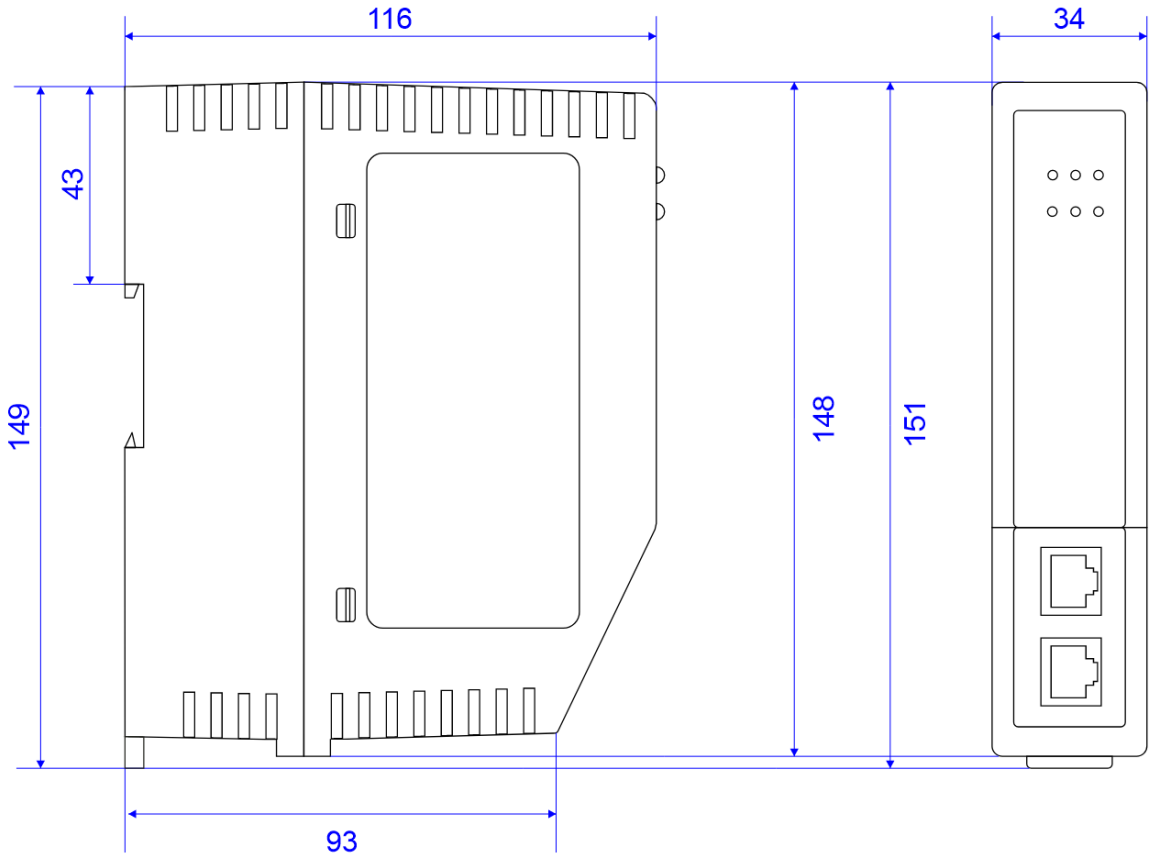

Figure 3.1 – BACnet Master enclosure dimensions

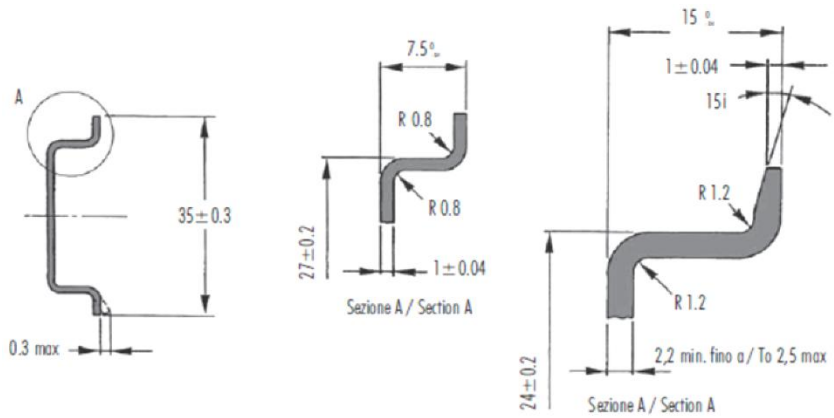

Figure 3.2 - Required DIN dimensions

3.1. ELECTRICAL

Specification	Rating
Power requirements	Input: 10 – 32V DC, (121 mA @ 24 VDC)
Voltage Fluctuations	Voltage fluctuations < ±10% Transient Over-voltages up to the levels of OVERVOLTAGE CATEGORY I
Power consumption	3.1 W (Including full load on USB of 200mA) 300 mA maximum
USB Power	5V, maximum load of 200 mA (1W).
Connector	3-way terminal
Conductors	24 – 18 AWG
Earth connection	Yes, terminal based
Emissions	IEC61000-6-4
ESD Immunity	EN 61000-4-2
Radiated RF Immunity	IEC 61000-4-3
EFT/B Immunity	EFT: IEC 61000-4-4
Surge Immunity	Surge: IEC 61000-4-5
Conducted RF Immunity	IEC 61000-4-6

Table 3.1 - Electrical specification.

3.2. ENVIRONMENTAL

Specification	Rating
Enclosure rating	IP20, NEMA/UL Open Type Indoor use only
Temperature	-20 – 70 °C
Relative Humidity	5% to 90% - No condensation
Pollution Degree	2
Altitude	< 2000 m

Table 3.2 - Environmental specification.

3.3. ETHERNET

Specification	Rating
Connector	RJ45
Conductors	CAT5 STP/UTP
ARP connections	Max 200
TCP connections	Max 200
CIP connections	Max 20
Communication rate	10/100Mbps
Duplex mode	Full/Half
Auto-MDIX support	Yes
Controller Support	ControlLogix, CompactLogix, MicroLogix, SLC
Embedded switch	Yes, 2 x Ethernet ports
Device Level Ring (DLR)	Supported
Network Time Protocol (NTP)	Supported

Table 3.3 - Ethernet specification.

3.4. SERIAL PORT (RS232)

Specification	Rating
RS232 Connector	9-way terminal (shared with RS485)
RS232 Conductor	24 – 18 AWG
Electrical Isolation	1000 Vdc
BAUD	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Parity	None, Even, Odd
Data bits	8
Stop bits	1

Table 3.4 – RS232 Serial Port specification.

3.5. SERIAL PORT (RS485)

Specification	Rating
RS485 Connector	9-way terminal (shared with RS232)
RS485 Conductor	24 – 18 AWG
Electrical Isolation	1500 Vrms for 1 minute.
BAUD	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Parity	None, Even, Odd
Data bits	8
Stop bits	1

Table 3.5 – RS485 Serial Port specification.

3.6. BACNET

Specification	Rating
Maximum BACnet Points	200 (A-BNM-B) 1000 (A-BNM-P) 2500 (A-BNM-M)
Maximum BACnet Devices	50 (A-BNM-B) 250 (A-BNM-P) 250 (A-BNM-M)
Mapped Properties per Device	256
BACnet Protocols Supported	BACnet MSTP (485) BACnet /IP BACnet /Ethernet
Supported Functions	Read, Write, Write-on-change, COV (change-of-value), COV Property, COV Property Increment.
Supported Objects	See section 9.1.

Table 3.6 – BACnet specification

3.7. ETHERNET/IP TARGET

Specification	Rating
Class 1 Cyclic connection count	25
Minimum RPI	20 ms (1 - 5 total connections) 40 ms (6 - 10 total connections) 60 ms (11 - 15 total connections) 80 ms (16 - 20 total connections) 100 ms (21 - 25 total connections)

Table 3.7 – EtherNet/IP Target specification

3.8. ETHERNET/IP ORIGINATOR

Specification	Rating
Class 1 Cyclic Connections Supported	Yes
Class 3 / UCMM Connections Supported	Yes
Class 1 Connection Count	10
Class 3 / UCMM Target Device Count	10
Class 3 / UCMM Mapping Count	50
Logix Direct-to-Tag Supported	Yes

Table 3.8 – EtherNet/IP Originator specification

3.9. MODBUS CLIENT

Specification	Rating
Modes Supported	Modbus TCP, Modbus RTU232, Modbus RTU485
Max. Modbus Server Devices	20
Max. Modbus Mapping	100
Mapping Ranges	Holding Register 0 – 4999 Input Register 0 – 4999 Input Status 0 – 4999 Coil Status 0 – 4999
Base Offset	Modbus (Base 0)

	PLC (Base 1)
Configurable Modbus TCP Port	Yes
Data Reformatting Supported	BB AA BB AA DD CC CC DD AA BB DD CC BB AA

Table 3.9 – Modbus Client specification

3.10. MODBUS SERVER

Specification	Rating
Modes Supported	Modbus TCP, Modbus RTU232, Modbus RTU485
Mapping Ranges	Holding Register 0 – 4999 Input Register 0 – 4999 Input Status 0 – 4999 Coil Status 0 – 4999
Base Offset	Modbus (Base 0) PLC (Base 1)
Configurable Modbus TCP Port	Yes

Table 3.10 – Modbus Server specification

3.11. CERTIFICATIONS

Certification	Mark
CE Mark	CE
RoHS2 Compliant	RoHS2
UL Mark File: E494895	c UL us LISTED CLASS 1, DIV 2, GROUPS A, B, C, D T5

UKCA	
ODVA Conformance	

Table 3.11 – Certifications