

ADDENDUM: Aegis II/DCM510 Communication Driver Card

Aegis II



DCM510



Industrial Communication Driver Card
"Com Module"

Communication Driver Part Number: 734593

This document contains general information regarding the implementation of the ProMinent Industrial Communication Card, "Com Module" into the Aegis II and DCM510 series Controllers.

1. Description
2. Layman's Glossary of terms
3. Multiple Protocols
4. Com Module Installation
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6. The RTU Slave Connection
7. Gateway Settings
8. The Inputs and Outputs
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1 Description

The ProMinent Industrial Communication Driver card (Com Module) provides the Aegis II and DCM510 controllers with the ability to interface with most industrial communication protocols thus providing the customer with live I/O values.

The Com Module includes:

- Two 4-20mA outputs, assigned as I/O points **I** and **J**
- One Modbus RTU (RS-485 serial) Master port for a Modbus Pyxis Fluorometer which will be assigned point **M**. Any previous use of **M** will be removed. See section 5.
- Modbus RTU (RS-485 serial) Slave communication ports for use with a Modbus RTU network or any Modbus RTU gateway.
- Can be ordered separately or with a power supply and terminal strip mounted in an enclosure. See section 9.

Optionally, a dual 4-20mA input driver card can be added to this module. Currently, this is the only driver that can be added. These inputs are assigned letters **K** and **L** in the controller program. If **K** and **L** were previously in use, those programs are removed.

The Modbus connection is Read only. This connection will not allow any user to edit or modify any part of the program. Only live I/O data is available. See a complete list of the controller I/O in section 8.

The Slave port can be directly connected to any Modbus RTU Master. RTU Masters includes various SCADA systems as well as Gateways which convert the data to other Protocols.

Once the Com Module Slave port is connected to a Master, the second Com Module Slave port can be used to 'Daisy Chain' other Modbus RTU Slave devices to the same Master. See Daisy Chain example on page 10.

Note: A Master port can monitor multiple Slave devices. A Slave device must obey one and only one Master.

ProMinent has optional Gateway devices to convert this serial connection to Modbus TCP-IP (Ethernet), BACnet MS/TP (RS 485-Serial) and BACnet IP (Ethernet). Each gateway can be chosen with or without UL certification.

2 Layman's Glossary of terms

TCP and IP indicate Ethernet type connections. MSTP and RTU indicates a serial connection.

In the chart below, the first gateway has the description "Modbus TCP Slave/Modbus Master". This describes the gateway as being a slave to the customers Modbus TCP(Ethernet) and passing through to our driver via the serial port as a Master to our driver card slave connection. Therefore, in each of these descriptions, '**Modbus Master**' refers to the serial connection between the Gateway and our communication driver.

3 Multiple Protocols

The following chart list Gateways available through ProMinent. Other Gateways are available from electronics vendors. **These gateway part numbers do not include complete kits. See section 9.**

PFC Part #	Description
1092940	Modbus TCP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092941	Modbus TCP Slave / Modbus Master – Converter (ADFweb brand)
1092942	BACnet IP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092943	BACnet IP Slave / Modbus Master – Converter (ADFweb brand)
1092964	BACnet MSTP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092965	BACnet MSTP Slave / Modbus Master – Converter (ADFweb brand)

Any gateway that can convert from the user's protocol to Modbus RTU can be used with the Com Module. RTA gateways are UL certified. ADFweb brands are not.

An example of Gateways from RTA is shown below.

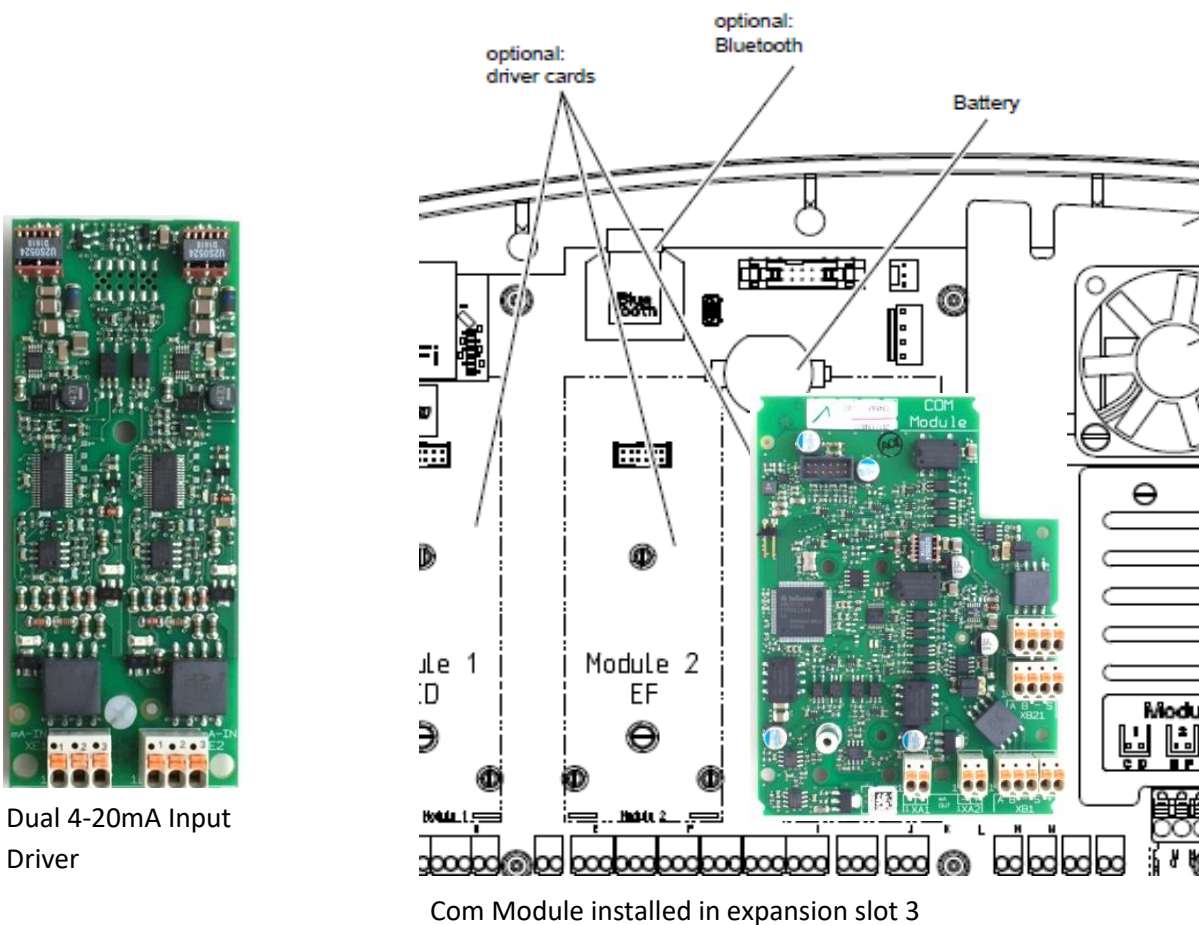
Allen Bradley PCL	ASCII	BACnet/IP Client
BACnet/IP Server	BACnet MS/TP Initiator	BACnet MS/TP Responder
DeviceNet Master	DeviceNet Slave	DF1 Devices
Ethernet/IP Adapter	Ethernet/IP Scanner	Modbus RTU Slave
Modbus TCP/IP Client	Modbus TCP/IP Server	Profibus Master
Profinet Controller	Ethernet TCP/IP	USB

4 Com Module Installation

From the factory, the Com Module will be installed in expansion slot 3. This card will **not** operate in expansion slots 1 or 2. A plastic screw secures the card in place. The Com module may or may not have an optional driver card attached. This optional driver is supplied with a plastic support screw as well. See optional driver card below.

Never install nor remove any driver or Com Module with power applied to the controller.

Instructions for installation, operation and maintenance of the 4-20mA input driver are in the controller operation manuals.



The dual 4-20mA input driver can be installed in any expansion slot, Module 1, Module 2, Module 3 on in the feed through slot on the communication driver card. See next page.

When the dual 4-20mA input driver is installed onto the Com Module, it is represented by the letters **K** and **L**. The two 4-20mA output terminals on the Com Module now represent the #3 expansion letters **I** and **J**.



The Wiring Terminal Table shows all connections to the Com Module

Driver card installed on Com module

Wiring Terminal Table:

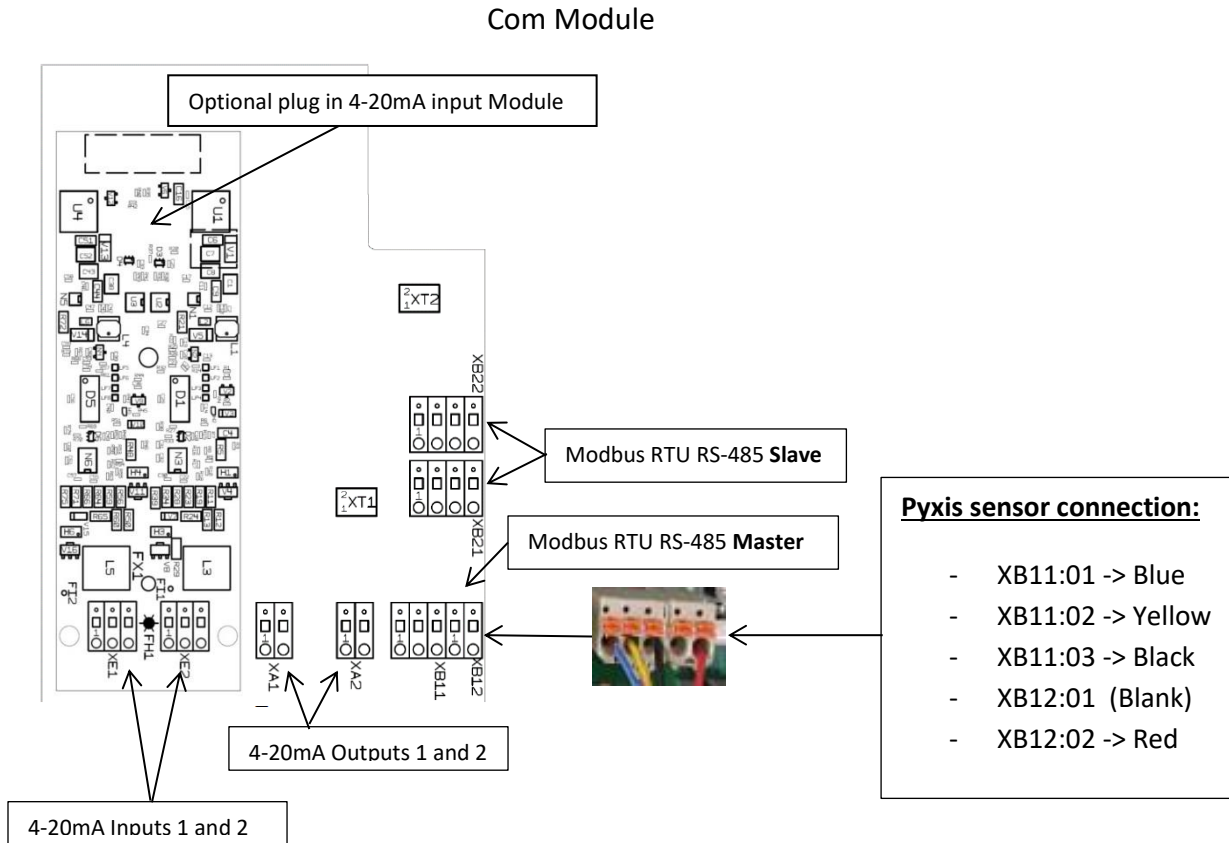
Component	Function	description	connection
XT1	Modbus RTU Master to ext. Slave	resistor jumpers	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>1 <input type="checkbox"/> 2 failsafe 3 <input type="checkbox"/> 4 termination 5 <input type="checkbox"/> 6</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>1 <input type="checkbox"/> 2 standard 3 <input type="checkbox"/> 4 termination 5 <input type="checkbox"/> 6 or SW control</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>1 <input type="checkbox"/> 2 no termination 3 <input type="checkbox"/> 4 (park position) 5 <input type="checkbox"/> 6</p> </div>
XT2	Modbus RTU Slave to ext. Master	resistor jumpers	
XA1	mA output Channel 1		Pin 1 = (-) Pin 2 = (+)
XA2	mA output Channel 2		Pin 1 = (-) Pin 2 = (+)
XB11	Modbus RTU Master to ext. Slave		Pin 1 = (A) Pin 2 = (B) Pin 3 = (GND)
XB12	Modbus RTU Master to ext. Slave		Pin 1 = (shield) Pin 2 = (+24)
XB21	Modbus RTU Slave to ext. Master	For Daisy chain	Pin 1 = (A) Pin 2 = (B) Pin 3 = (GND) Pin 4 = (shield)
XB22	Modbus RTU Slave to ext. Master		
XE1	mA input Channel 1	(optional driver)	Pin 1 = (GND) Pin 2 = (mA input) Pin 3 = (+23)
XE2	mA input Channel 2	(optional driver)	Pin 1 = (GND) Pin 2 = (mA input) Pin 3 = (+23)

5 Pyxis Sensor

The Com card was constructed to accept a Modbus RTU version Pyxis Fluorometer. Connect the sensor as shown below. This is currently the only input to the Master Modbus RTU terminals.

The fluorometer on input **M** can be monitored, used for control, show diagnostics and be calibrated through the keypad or via a network connection using the Ethernet port or WiFi.

Consult the Aegis II/DCM510 and Pyxis manuals for programming instructions.



The Modbus RTU slave connections allow other entities to **monitor** this controller. The users can see the I/O values but cannot edit them.

6 The RTU Slave Connection

Connect up to 120 communication driver card slaves to one master. The master can be the plant Modbus RTU network or any number of Gateways. Currently, ProMinent has six gateways in stock that provide conversion to 3 protocols; Modbus TCP (Ethernet), BACnet IP (Ethernet) and BACnet MSTP (Serial). These gateways are available with or without UL approval. The RTA brands are UL approved. The ADFweb brands are not UL approved and are therefore available at a lesser price. See also section 9 for complete enclosure kits.

Gateway devices require a separate DC power supply. See instructions accompanying the Gateway.

The next few illustrations depict ADFweb brand, **non-UL approved** gateways which convert the Com Module Modbus RTU Slave to another Protocol. The connection to the Com card is via the Modbus Master serial port on the Gateway. The Gateway Slave port connects to the plant network Master. This port can be serial or Ethernet as you choose.

ADFweb Modbus TCP (Ethernet) Slave to Modbus Master. Not UL approved.

(Description explanation: 'Modbus TCP Slave' is the Gateway's connection to the plant master via Ethernet. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Wiring the gateway terminal to Com card:

A+ to XB21 pin 1 (A), B - to pin 2 (B), Common (S) to pin 3 (Shown as a dash).

To load Configuration please refers to manufacture instruction manual MN67507_ENG section **"UPDATE VIA UDP:"**

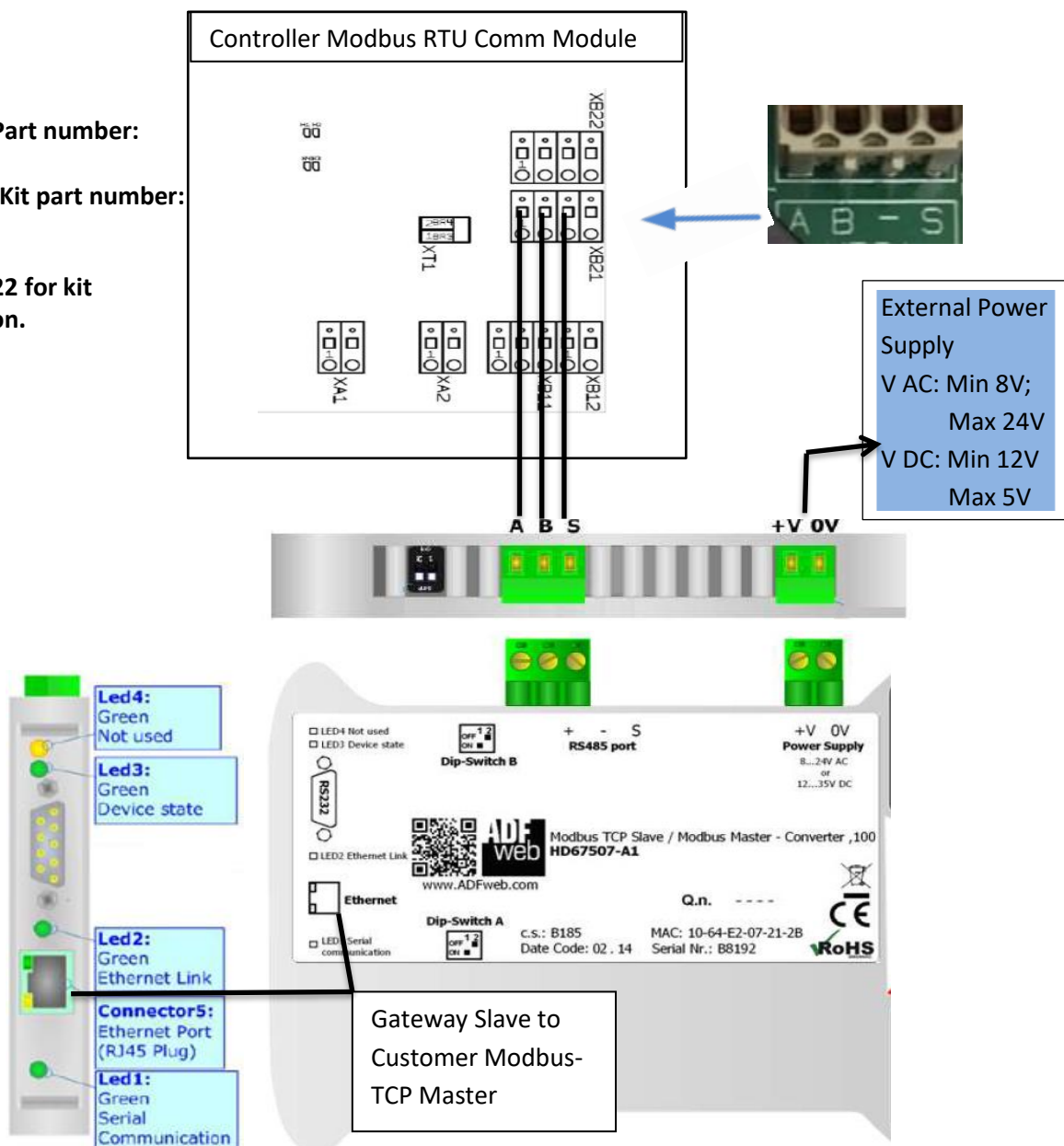
Gateway Part number:

1092941

Complete Kit part number:

1094286

See page 22 for kit information.



ADFweb BACnet IP (Ethernet) Slave to Modbus Master. Not UL approved.

(Description explanation: 'BACnet IP Slave' is the Gateway's connection to the plant master via Ethernet. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Gateway terminal to Com card: A+ to XB21 pin 1 (A), B - to pin 2 (B), Common (S) to pin 3 (Shown as a dash).

To load Configuration please refers to manufacture instruction manual MN67671_ENG section

"UPDATE DEVICE:"

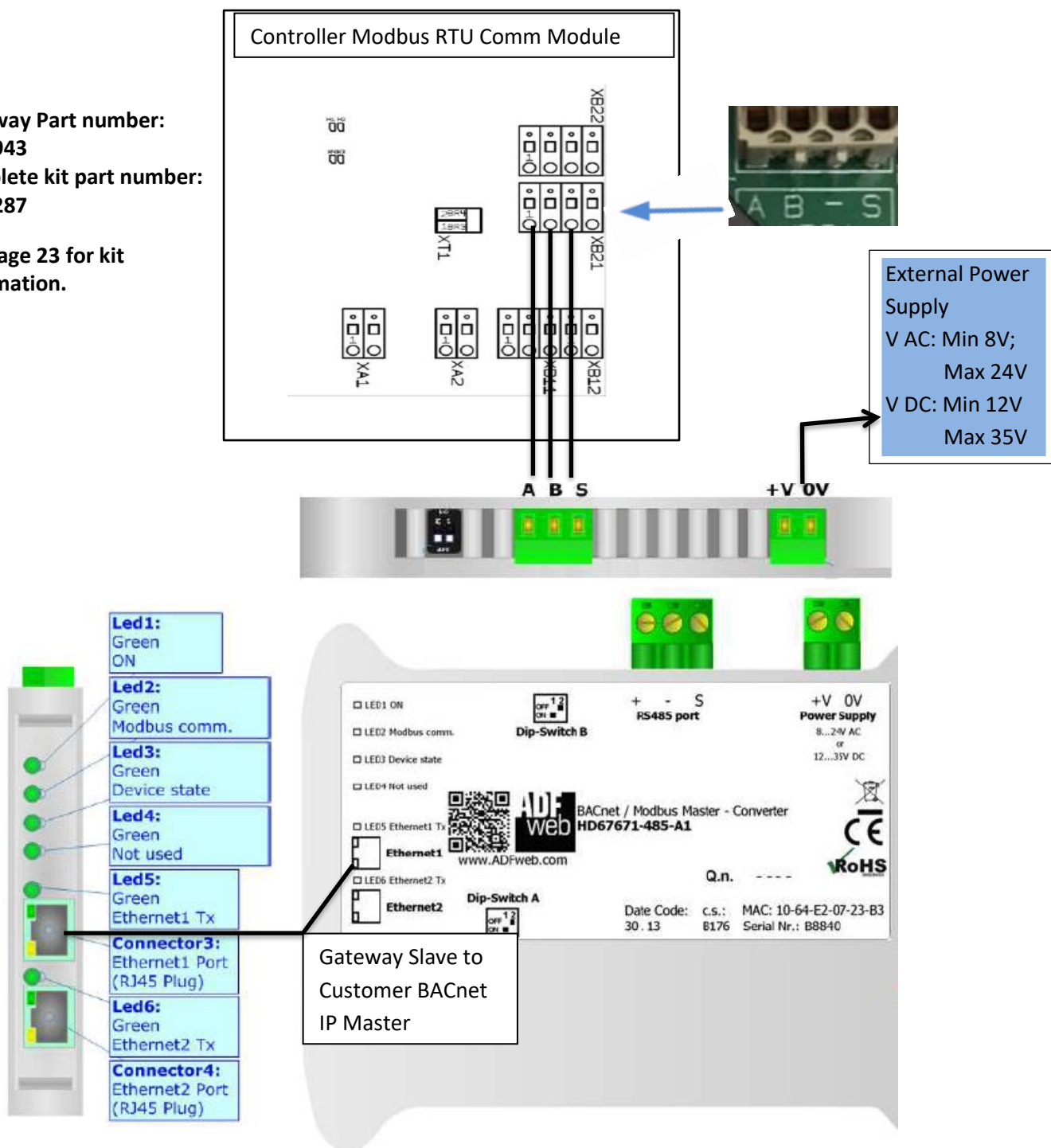
Gateway Part number:

1092943

Complete kit part number:

1094287

See page 23 for kit information.



ADFweb BACnet MSTP (Serial) Slave to Modbus Master. Not UL approved.

(Description explanation: 'BACnet MSTP Slave' is the Gateway's connection to the plant master via Serial wiring. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Gateway terminal to Com card: A+ to XB21 pin 1 (A), B - to pin 2 (B), Common (S) to pin 3 (Shown as a dash).

To load Configuration please refers to manufacture instruction manual MN67671_ENG section

"UPDATE DEVICE:"

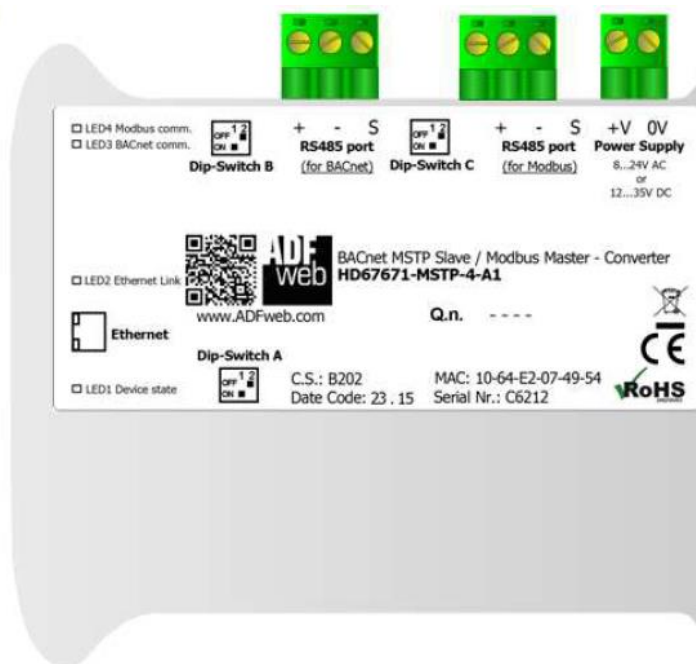
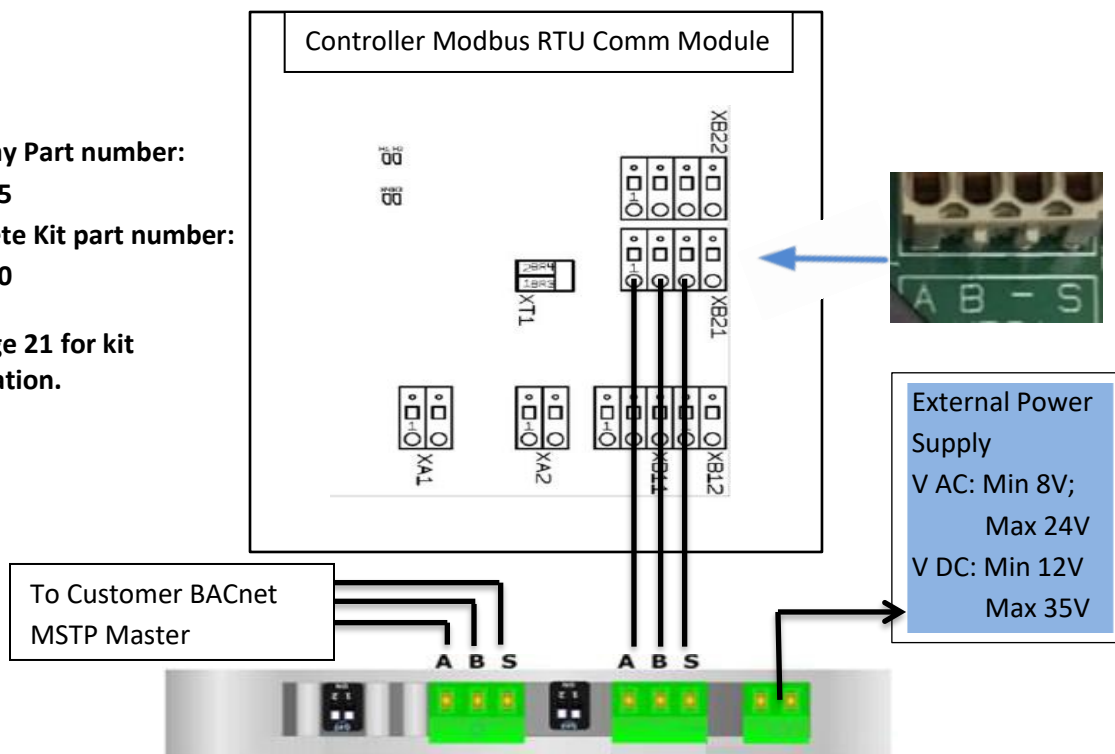
Gateway Part number:

1092945

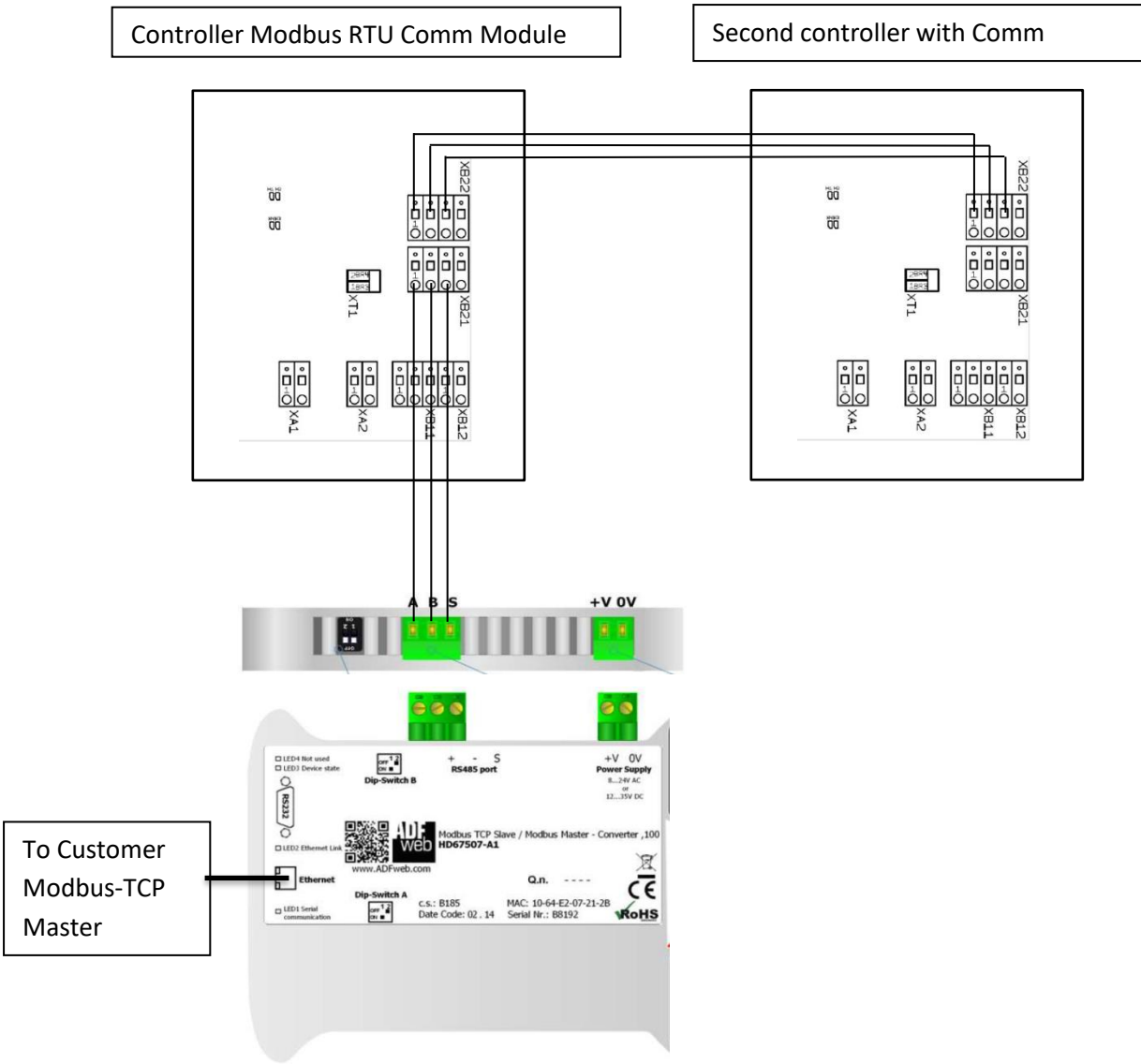
Complete Kit part number:

1094290

See page 21 for kit information.



Daisy Chain Example:



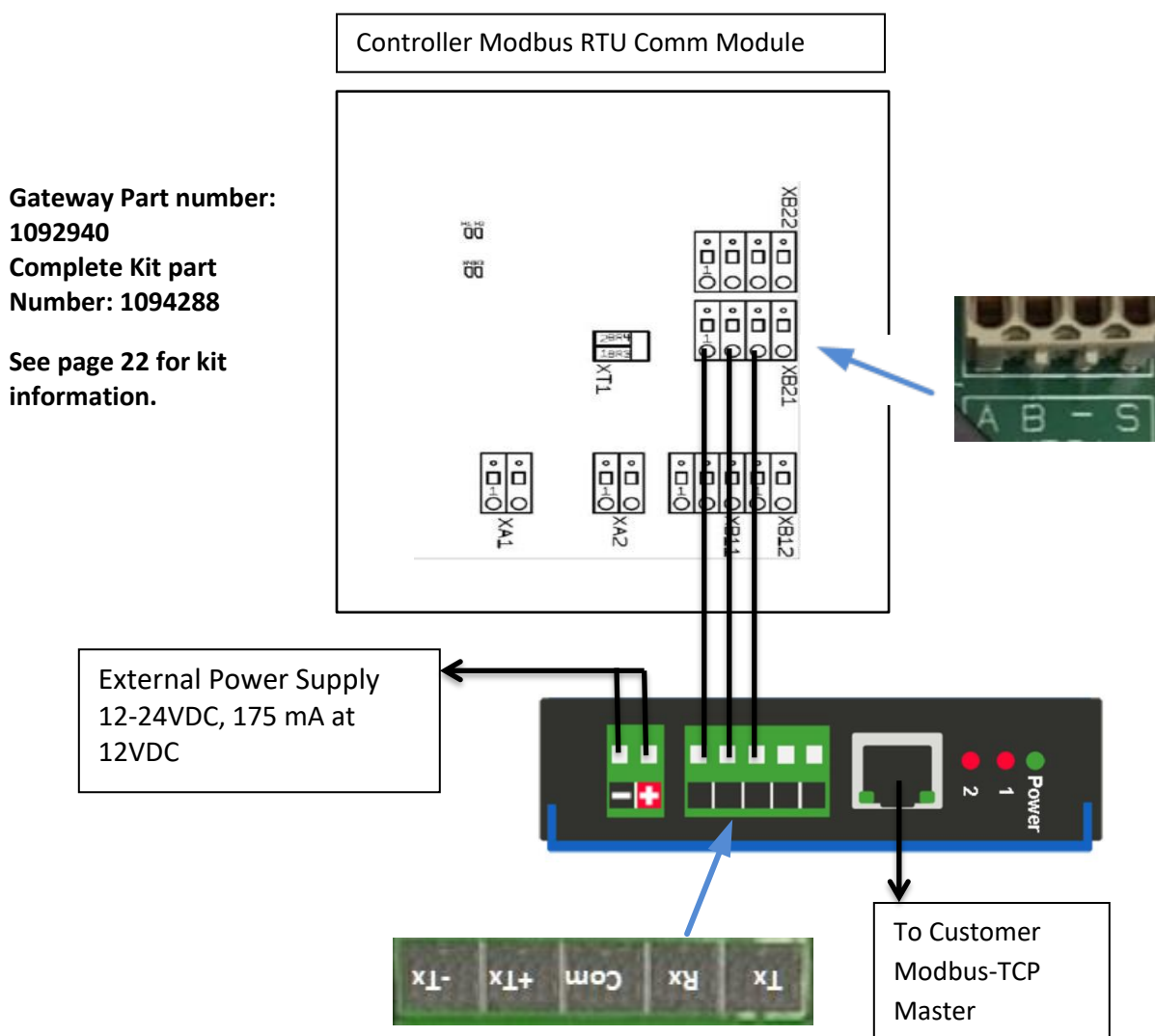
The RTA brand, UL approved models are shown here. Refer to manufacturer instructions for more detail.

RTA Modbus TCP (Ethernet) Slave to Modbus Master. UL approved.

(Description explanation: 'Modbus TCP Slave' is the Gateway's connection to the plant master via Ethernet. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Wiring the gateway terminal to Com card: Tx- to XB21 pin 1 (A), Tx+ to pin 2 (B), Com to pin 3 (Shown as a dash).

To load a configuration, please refer to the manufacture's instruction manual BFR3000-NNA1_Userguide.



RTA BACnet IP (Ethernet) Slave to Modbus Master. UL approved.

(Description explanation: 'BACnet IP Slave' is the Gateway's connection to the plant master via Ethernet. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Wiring the gateway terminal to Com card: Tx- to XB21 pin 1 (A), Tx+ to pin 2 (B), Com to pin 3 (Shown as a dash).

To load Configuration please refers to manufacture instruction manual 460MMBS-NNA1_Userguide.

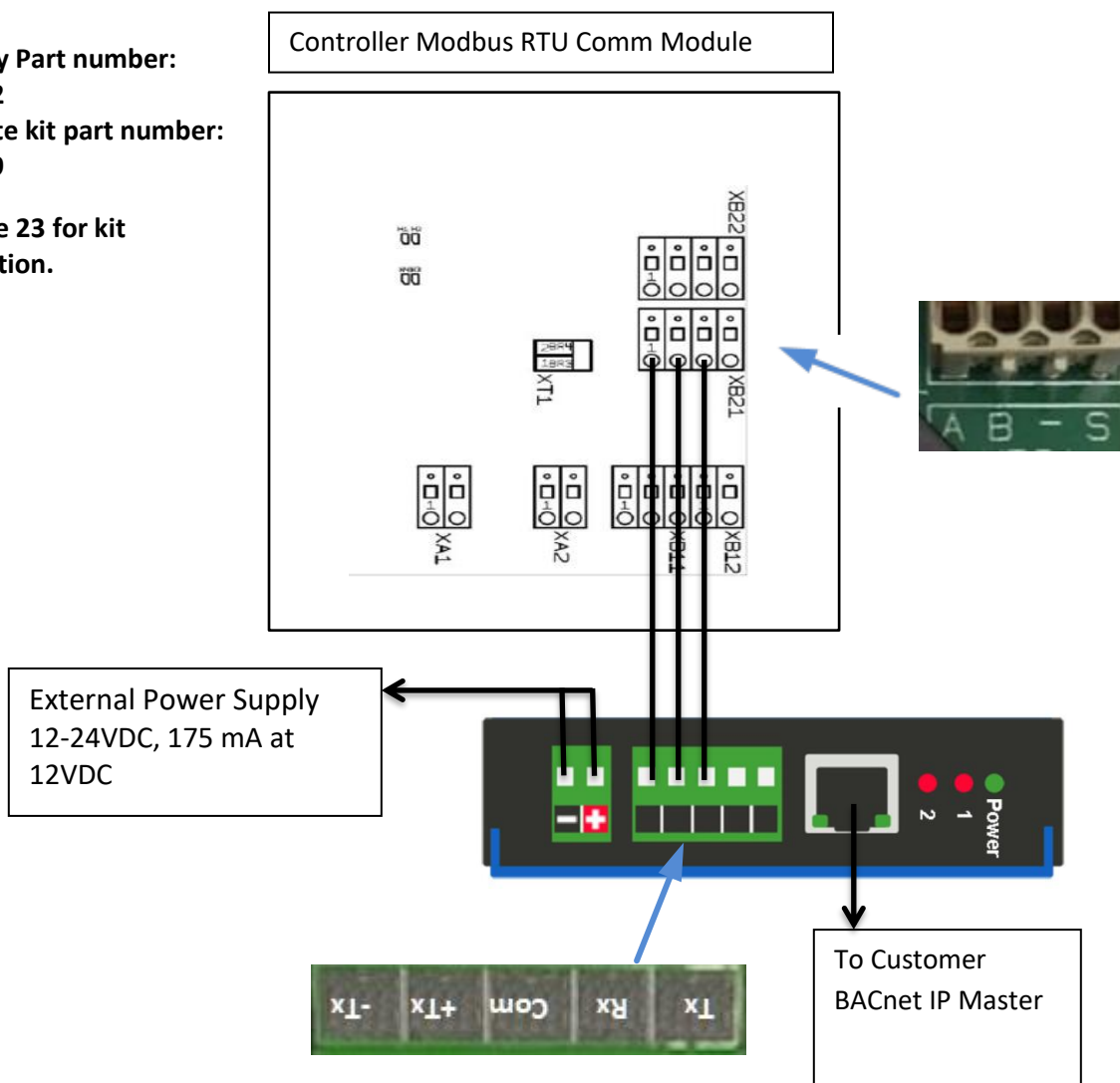
Gateway Part number:

1092942

Complete kit part number:

1094289

See page 23 for kit information.



RTA BACnet MSTP (Serial) to Modbus Master. UL approved.

(Description explanation: 'BACnet MSTP Slave' is the Gateway's connection to the plant master via Serial wiring. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

Wiring the gateway terminal to Com card: Tx- to XB21 pin 1 (A), Tx+ to pin 2 (B), Com to pin 3 (Shown as a dash).

To load Configuration please refers to manufacture instruction manual 460MMBMS-NNA4_Userguide.

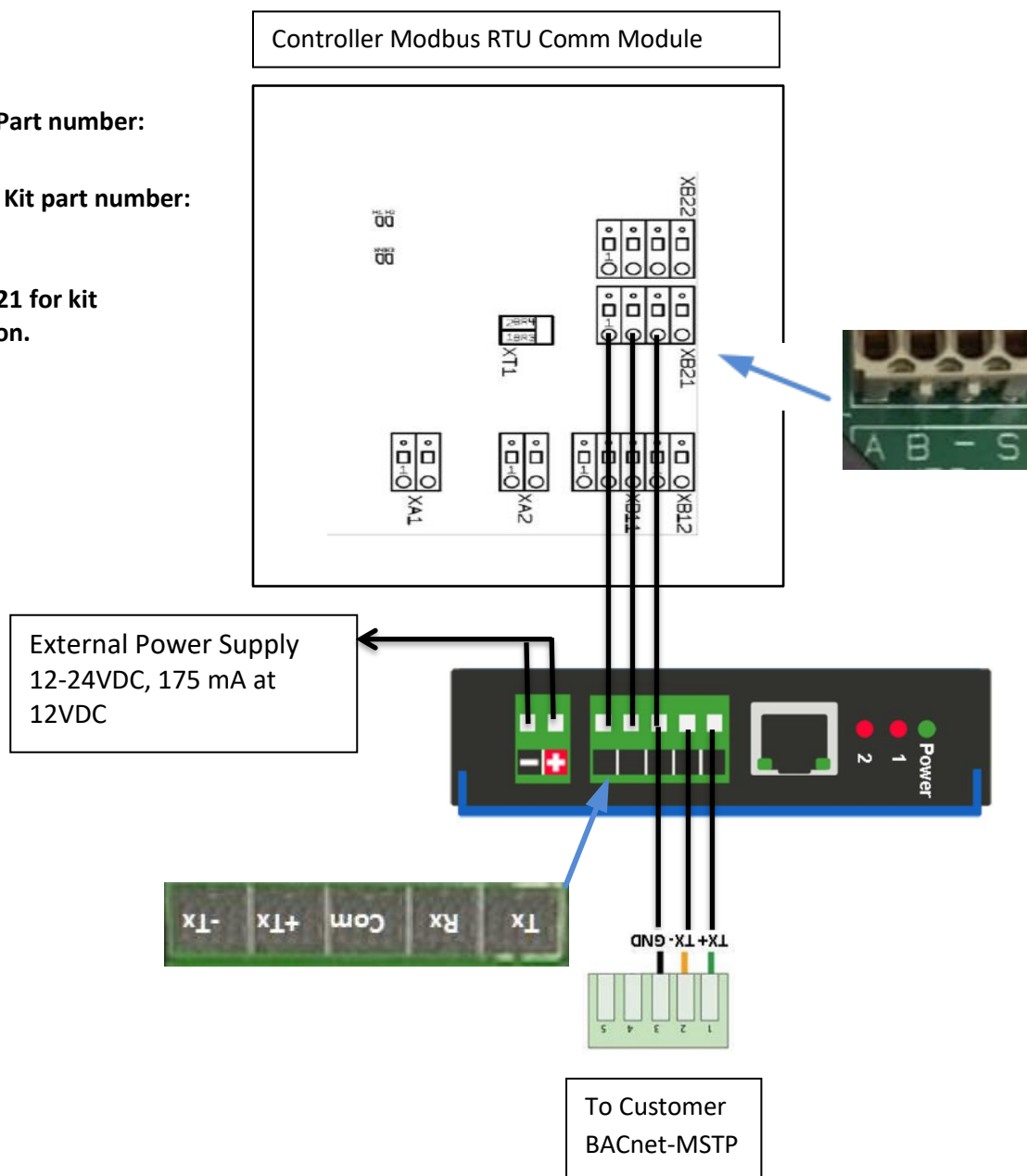
Gateway Part number:

1092946

Complete Kit part number:

1094291

See page 21 for kit information.



7 Gateway Settings

The implementation of the Modbus interface is based on the following standards:

http://www.modbus.org/docs/Modbus_over_serial_line_V1_02.pdf. More information about Modbus can be found at www.modbus.org.

The ProMinent Aegis II and DCM510 Modbus interface supports RS-485 interface standard

- Half-duplex, 2-wire technology
- twisted pair cable [twisted pair]
- Differential voltage level ± 5 V
- Cable length up to 1200 m

The device can be connected as an endpoint slave (either with one of the connections) or as [Daisy-Chain-Slave] (with both connections).

Default-Connection-Settings:

This is the default configuration for Aegis II/DCM510 controller Modbus interface; this configuration can be modified in System -> Communication Menu

Parameter	Standard Value
Serial Mode	RS-485 differential
Termination	Disabled
Serial Format	8 data bits Odd parity 1 stop bit
Baud rate	19200
Slave Address	10

Supported Modbus commands:

Function Code: Read-Holding-Register 0x03 (3)

Note: To have access to all Modbus registers you will need to have a Modbus driver card with firmware version 1.0.23.0 or newer and controller firmware 18.04.14.00 (2018/April/14) or newer, otherwise you will have limited access to Modbus register

8 The Inputs and Outputs

Analog Inputs/Outputs:

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read W = Write	Byte order	info
500	501	Actual Measure Value on 'A' input	FLOAT32	R	BADC	
502	503	Actual Measure Value on 'B' input	FLOAT32	R	BADC	
504	505	Actual Measure Value on 'C' input	FLOAT32	R	BADC	
506	507	Actual Measure Value on 'D' input	FLOAT32	R	BADC	
508	509	Actual Measure Value on 'E' input	FLOAT32	R	BADC	
510	511	Actual Measure Value on 'F' input	FLOAT32	R	BADC	
512	513	Actual Measure Value on 'G' input	FLOAT32	R	BADC	
514	515	Actual Measure Value on 'H' input	FLOAT32	R	BADC	
516	517	Actual Measure Value on 'I' input	FLOAT32	R	BADC	Assigned to 4-20mA output 1 (Comm Module)
518	519	Actual Measure Value on 'J' input	FLOAT32	R	BADC	Assigned to 4-20mA output 2 (Comm Module)
520	521	Actual Measure Value on 'K' input	FLOAT32	R	BADC	Assigned to 4-20mA input 1 (Comm Module)
522	523	Actual Measure Value on 'L' input	FLOAT32	R	BADC	Assigned to 4-20mA input 2 (Comm Module)
524	525	Actual Measure Value on 'M' input	FLOAT32	R	BADC	Modbus Pyxis Sensor
526	527	Actual Measure Value on 'N' input	FLOAT32	R	BADC	

Digital Outputs:

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
552	553	Output 'Relay 1'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0
554	555	Output 'Relay 2'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0
556	557	Output 'Relay 3'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0
558	559	Output 'Relay 4'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0
560	561	Output 'Relay 5'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0
562	563	Output 'P6'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0 Pulse: 0-100 %
564	565	Output 'P7'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0 Pulse: 0-100 %
566	567	Output 'P8'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0 Pulse: 0-100 %
568	569	Output 'P9'	FLOAT32	R	BADC	ON/OFF: ON=1, OFF =0 Pulse: 0-100 %

Digital Inputs:

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
528	529	Input 'O'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
530	531	Input 'P'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
532	533	Input 'Q'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
534	535	Input 'R'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
536	537	Input 'S'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
538	539	Input 'T'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
540	541	Input 'U'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
542	543	Input 'V'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
544	545	Input 'W'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
546	547	Input 'X'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
548	549	Input 'Y'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume
550	551	Input 'Z'	FLOAT32	R	BADC	Contact: Closed=1, Opened=0 Water meter/turbine: Volume

Alarms:

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
570	571	Input 'A', High Alarm	FLOAT32	R	BADC	
572	573	Input 'A', Low Alarm	FLOAT32	R	BADC	
574	575	Input 'B', High Alarm	FLOAT32	R	BADC	
576	577	Input 'B', Low Alarm	FLOAT32	R	BADC	
578	579	Input 'C', High Alarm	FLOAT32	R	BADC	
580	581	Input 'C', Low Alarm	FLOAT32	R	BADC	
582	583	Input 'D', High Alarm	FLOAT32	R	BADC	
584	585	Input 'D', Low Alarm	FLOAT32	R	BADC	
586	587	Input 'E', High Alarm	FLOAT32	R	BADC	
588	589	Input 'E', Low Alarm	FLOAT32	R	BADC	
590	591	Input 'F', High Alarm	FLOAT32	R	BADC	
592	593	Input 'F', Low Alarm	FLOAT32	R	BADC	
594	595	Input 'G', High Alarm	FLOAT32	R	BADC	
596	597	Input 'G', Low Alarm	FLOAT32	R	BADC	
598	599	Input 'H', High Alarm	FLOAT32	R	BADC	
600	601	Input 'H', Low Alarm	FLOAT32	R	BADC	
602	603	Input 'I', High Alarm	FLOAT32	R	BADC	
604	605	Input 'I', Low Alarm	FLOAT32	R	BADC	
606	607	Input 'J', High Alarm	FLOAT32	R	BADC	
608	609	Input 'J', Low Alarm	FLOAT32	R	BADC	
610	611	Input 'K', High Alarm	FLOAT32	R	BADC	
612	613	Input 'K', Low Alarm	FLOAT32	R	BADC	
614	615	Input 'L', High Alarm	FLOAT32	R	BADC	
616	617	Input 'L', Low Alarm	FLOAT32	R	BADC	
618	619	Input 'M', High Alarm	FLOAT32	R	BADC	
620	621	Input 'M', Low Alarm	FLOAT32	R	BADC	
622	623	Input 'N', High Alarm	FLOAT32	R	BADC	
624	625	Input 'N', Low Alarm	FLOAT32	R	BADC	

Total Counter (if these inputs are configured as Daily counter):

If not configured as daily counter the register value will be NULL

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
626	627	Input 'O', Total Counter	FLOAT32	R	BADC	
628	629	Input 'P', Total Counter	FLOAT32	R	BADC	
630	631	Input 'Q', Total Counter	FLOAT32	R	BADC	
632	633	Input 'R', Total Counter	FLOAT32	R	BADC	
634	635	Input 'S', Total Counter	FLOAT32	R	BADC	
636	637	Input 'T', Total Counter	FLOAT32	R	BADC	
638	639	Input 'U', Total Counter	FLOAT32	R	BADC	
640	641	Input 'V', Total Counter	FLOAT32	R	BADC	

Setpoints:

SETPOINTS ONLY WORK IF “SET FEED MODE” IS SELECTED AS

Setpoints only work if “SET FEED MODE” is selected as a “SENSOR CONTROL” OR “WATER METER”

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
642	643	R 1 - high set point	FLOAT32	R	BADC	
644	645	R 1 - low set point	FLOAT32	R	BADC	
646	647	R 2 - high set point	FLOAT32	R	BADC	
648	649	R 2 - low set point	FLOAT32	R	BADC	
650	651	R 3 - high set point	FLOAT32	R	BADC	
652	653	R 3 - low set point	FLOAT32	R	BADC	
654	655	R 4 - high set point	FLOAT32	R	BADC	
656	657	R 4 - low set point	FLOAT32	R	BADC	
658	659	R 5 - high set point	FLOAT32	R	BADC	
660	661	R 5 - low set point	FLOAT32	R	BADC	
662	663	P 6 - high set point	FLOAT32	R	BADC	
664	665	P 6 - low set point	FLOAT32	R	BADC	
666	667	P 7 - high set point	FLOAT32	R	BADC	
668	669	P 7 - low set point	FLOAT32	R	BADC	
670	671	P 8 - high set point	FLOAT32	R	BADC	
672	673	P 8 - low set point	FLOAT32	R	BADC	
674	675	P 9 - high set point	FLOAT32	R	BADC	
676	677	P 9 - low set point	FLOAT32	R	BADC	

Error Message:

Register Address (Starting from 0)	Register Number (Starting from 1)	Parameter	Format (Type)	Access Level R= Read	Byte order	info
678	679	Input 'A'	UINT16	R	BADC	
679	680	Input 'B'	UINT16	R	BADC	
680	681	Input 'C'	UINT16	R	BADC	
681	682	Input 'D'	UINT16	R	BADC	
682	683	Input 'E'	UINT16	R	BADC	
683	684	Input 'F'	UINT16	R	BADC	
684	685	Input 'G'	UINT16	R	BADC	
685	686	Input 'H'	UINT16	R	BADC	
686	687	Input 'I'	UINT16	R	BADC	
687	688	Input 'J'	UINT16	R	BADC	
688	689	Input 'K'	UINT16	R	BADC	
689	690	Input 'L'	UINT16	R	BADC	
690	691	Input 'M'	UINT16	R	BADC	
691	692	Input 'N'	UINT16	R	BADC	
692	693	Input 'O'	UINT16	R	BADC	
693	694	Input 'P'	UINT16	R	BADC	
694	695	Input 'Q'	UINT16	R	BADC	
695	696	Input 'R'	UINT16	R	BADC	
696	697	Input 'S'	UINT16	R	BADC	
697	698	Input 'T'	UINT16	R	BADC	
698	699	Input 'U'	UINT16	R	BADC	
699	700	Input 'V'	UINT16	R	BADC	
700	701	Input 'W'	UINT16	R	BADC	
701	702	Input 'X'	UINT16	R	BADC	
702	703	Input 'Y'	UINT16	R	BADC	

703	704	Input 'Z'	UINT16	R	BADC	
704	705	Output 'R1'	UINT32	R	BADC	
706	707	Output 'R2'	UINT32	R	BADC	
708	709	Output 'R3'	UINT32	R	BADC	
710	711	Output 'R4'	UINT32	R	BADC	
712	713	Output 'R5'	UINT32	R	BADC	
714	715	Output 'P6'	UINT32	R	BADC	
716	717	Output 'P7'	UINT32	R	BADC	
718	719	Output 'P8'	UINT32	R	BADC	
720	721	Output 'P9'	UINT32	R	BADC	
722	723	System	UINT32	R	BADC	

Input A-Z States:

S_enabled	0x0001	disabled parameters are not logged, do not display, cannot be used in commands	
S_alarmed	0x0002	execute alarm action bit(s)	
S_events	0x0004	timed events exist for this relay	
S_arelay	0x0008	trip alarm relay on alarm	// if Alarm Relay is set to Yes in Alarm setting
S_off	0x0010	Actively Turned OFF by Interlock, Lockout, Alarmed (reference output states for cause)	
S_stopped	0x0020	HOA set to STOP	// not applicable to Aegis II
S_manual	0x0040	HOA set to MANUAL	// not applicable to Aegis II
S_disconn	0x0080	Serial sensor or Modbus Driver not responding	

Output R1-R5 and P6-P9 States:

Some of the bits reflect configuration (C_offonalarm), some reflect control state (C_rlocked)

Here is the example how to use these bitwise masking: If mask for bit 0 you will get ON/OFF state.

Note: in order to extract a subset of the bits in the value do Bitwise ANDing

Mask: 0x00000001b (C_on)

Value: 0x01010101b (R1 register 704 value)

Result: 0x00000001b (the result shows the relay is ON)

C_on	0x00000001	current state of Relay ON OFF or Pulse Drive, also Prime ON/OFF				
C_ilocked	0x00000002	interlocked on contact set (U to Z)				
C_tlocked	0x00000004	lockout on time				
C_vary	0x00000008	varying cycle controls, adjusts setpoints (unused for PID)				
C_do	0x00000010	Control Field Frequency output is set as Digital Output and also for Analog Outputs				
C_offonalarm	0x00000020	turned OFF on alarm				
C_rlocked	0x00000040	interlocked by another relay				

C_meters	0x00000080	control by Volume & Time	
C_special	0x00000100	control by special control	
C_sequence	0x00000200	2nd phase of an Q:P sequential volume control; ON for 'P'	//not applicable to DCM5
C_forcedon	0x00000400	prebleed has turned relay ON	//not applicable to DCM5
C_owed	0x00000800	time owed, count down if not blocked	
C_blocking	0x00002000	Output R1 to R5, P6 to P9 is blocking another relay	
C_oxidant	0x00004000	one of assist, pH lockout or alt. control events is active	// not applicable to Aegis II
C_delayed	0x00008000	User set delay on flow switch	// not applicable to Aegis II
C_drvfault	0x00010000	Driver card communication timeout (implies no card, card fault)	
C_prebleed	0x00020000	ON because prebleed active on time or uS	//not applicable to DCM5
C_ontrip	0x00100000	Set when ON setpoint exceeded, stays On until OFF setpoint exceeded	
C_eventsp	0x00200000	Set when Oxidant Event Setpoints override control setpoints	
C_latched	0x00800000	Contact Set controls, retains state during deadtime	

System State:

SYS_USB	0x00000400	USB host port active (USB thumb drive plugged in), file uploading, Pumps OFF, A/D blocked
SYS_LOCKED	0x00004000	LOCKOUT_LIMIT password fails, reset @ 7:00AM or power cycle
SYS_NOUSD	0x08000000	File System faults, no USD

9 Gateway Enclosure Kits

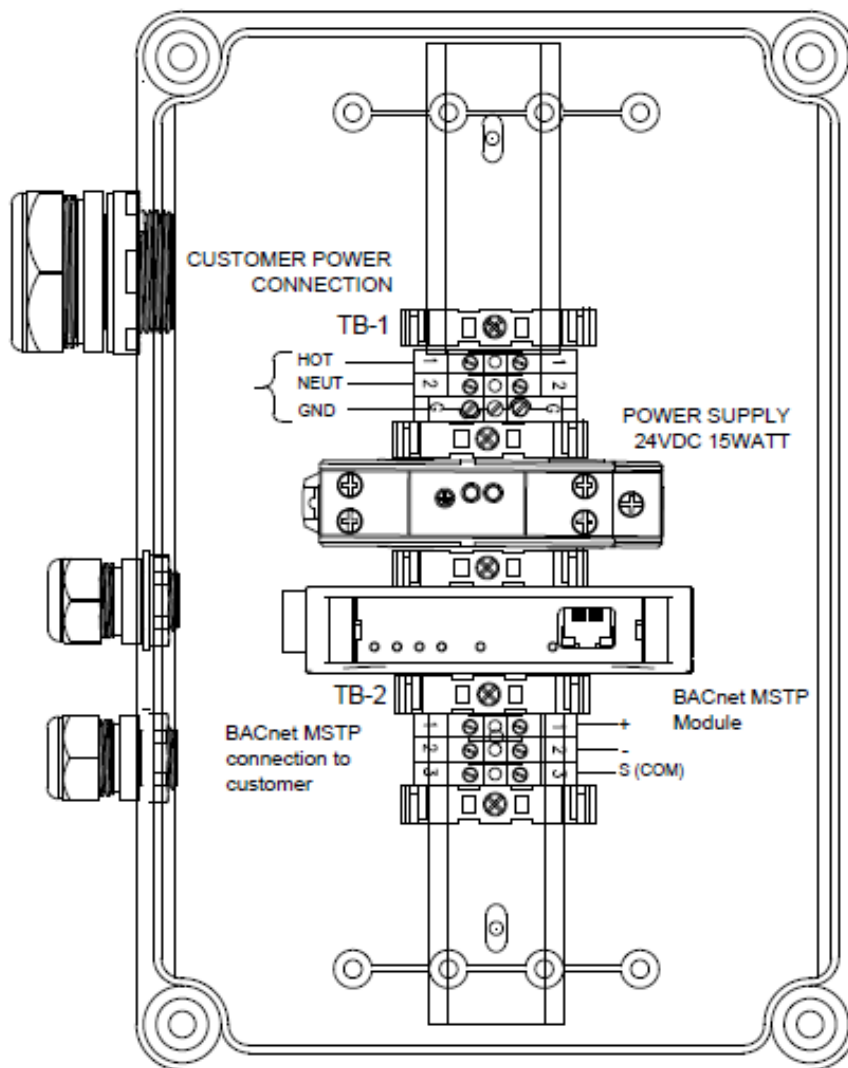
Kits include the gateway, a 24VDC power supply, serial terminations mounted in a Nema 4X enclosure.

BACnet MSTP Converter Terminal Box

Kit part number 1094290 includes the ADFweb (**not UL approved**) BACnet MSTP Slave to Modbus Master gateway, part number 1092945. See page 9 for gateway information.

Kit part number 1094291 includes the RTA (**UL approved**) BACnet MSTP Slave to Modbus Master gateway, part number 1092946. See page 13 for gateway information.

Dimensions: 10.88 x 7.38 x 9.06 Construction: Fibox NEMA 4X Polycarbonate

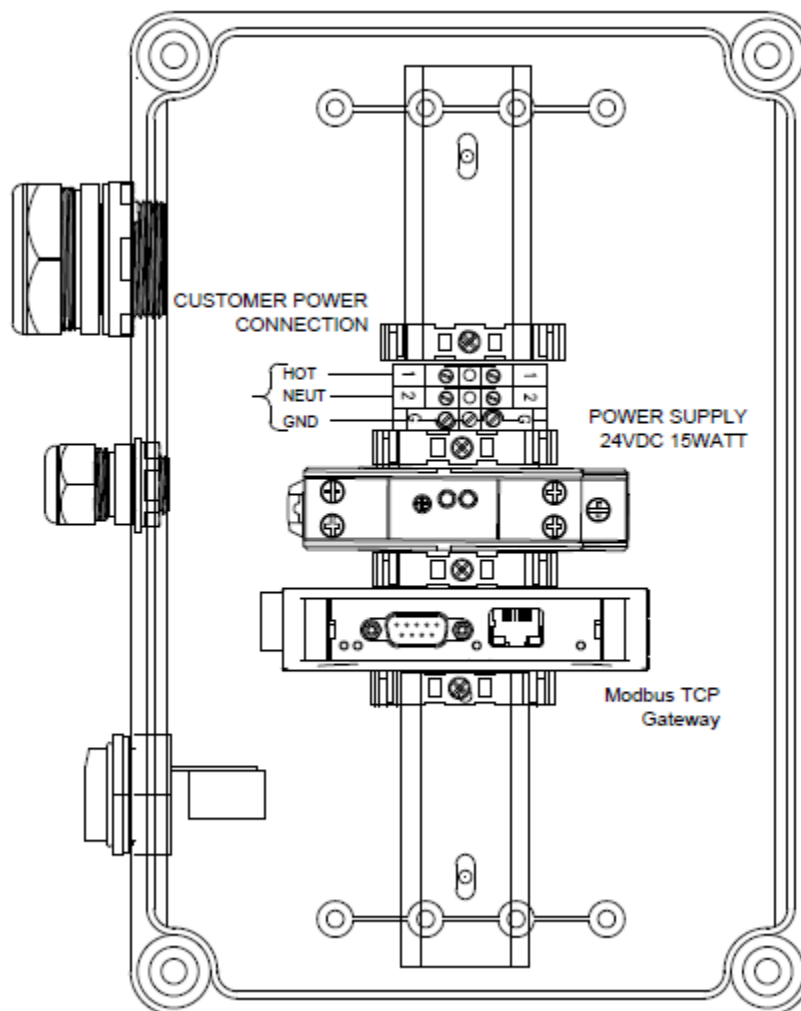


MODBUS TCP Converter Terminal Box

Kit part number 1094286 includes the ADFweb (**not UL approved**) Modbus TCP Slave to Modbus Master gateway, part number 1092941. See page 7 for gateway information.

Kit part number 1094288 includes the RTA (**UL approved**) Modbus TCP to Modbus Master gateway, part number 1092940. See page 11 for gateway information.

Dimensions: 10.88 x 7.38 x 9.06 Construction: Fibox NEMA 4X Polycarbonate

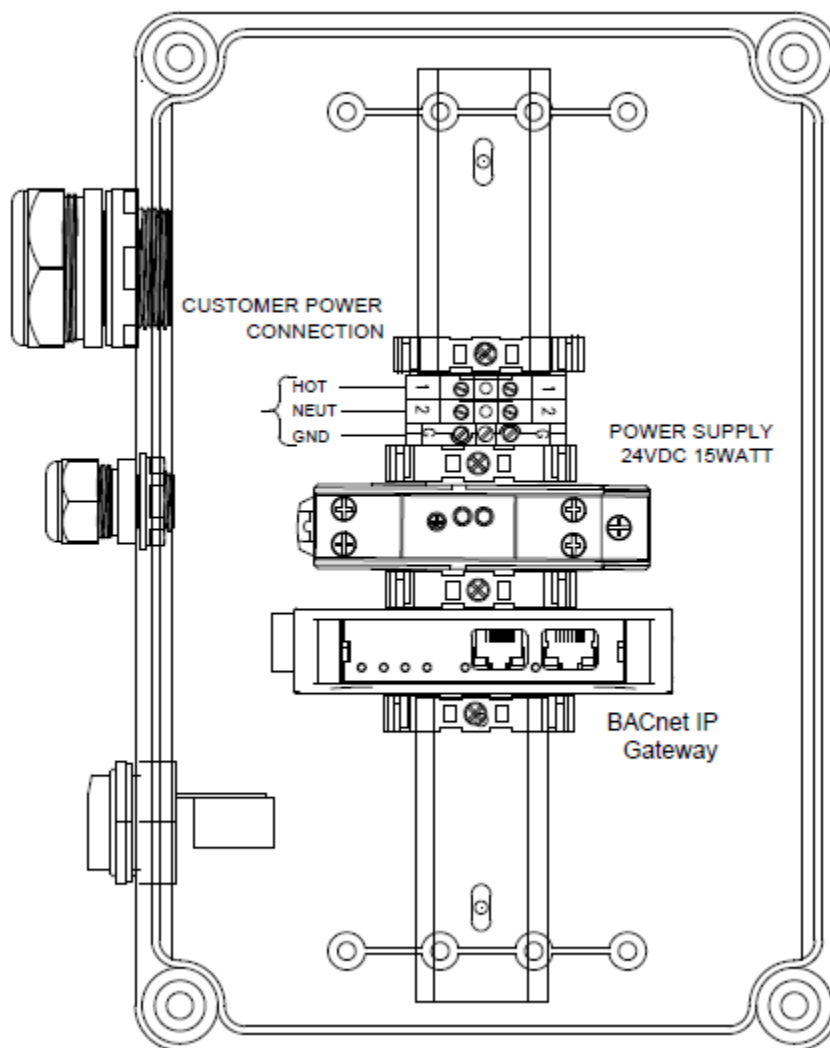


BACnet IP Converter Terminal Box

Kit part number 1094287 includes the ADFweb (**not UL approved**) BACnet IP Slave to Modbus Master gateway, part number 1092943. See page 8 for gateway information.

Kit part number 1094289 includes the RTA (**UL approved**) BACnet IP Slave to Modbus Master gateway, part number 1092942. See page 12 for gateway information.

Dimensions: 10.88 x 7.38 x 9.06 Construction: Fibox NEMA 4X Polycarbonate



10 Replacement Parts

The following list includes all parts necessary to build a complete enclosure, including the power supply, but does not include the gateway. Gateway part numbers below.

<u>1093990</u>	FIBOX UL LISTED ENCLOSURE 11 x 7.5 x 7.1
<u>1093991</u>	FIBOX EXTENSION FRAME
<u>7746273</u>	IDEC PS5R-VB24 15WATT PWR SUPPLY .4A ...
<u>7746750</u>	PHOENIX 0441504 USLKG5 GND TERM
<u>7746748</u>	PHOENIX 3004362 UK5N TERMINAL
<u>7746751</u>	PHOENIX 0800886 E/NS 35N END BRACKET
<u>7745053</u>	AUTO D, DN-R35S1, Slotted DIN Rail
<u>1093446</u>	RJ45 cover 5697T44
<u>1093447</u>	RJ45 Sealed Jack 5697T34
<u>1060820</u>	1' Cat5e WHITE CABLE
<u>703885</u>	Skintop fitting Pg 9 black
<u>7500067</u>	PG-9 Nut
<u>1048501</u>	SkintopSLN Strain Rlf Cbl Gland 1/2" NPT
<u>1048502</u>	Skintop GMP-GL Locknut 1/2" NPT

ProMinent Gateway part numbers

PFC Part #	Description
1092940	Modbus TCP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092941	Modbus TCP Slave / Modbus Master – Converter (ADFweb brand)
1092942	BACnet IP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092943	BACnet IP Slave / Modbus Master – Converter (ADFweb brand)
1092964	BACnet MSTP Slave / Modbus Master – Converter UL Certified (RTA brand)
1092965	BACnet MSTP Slave / Modbus Master – Converter (ADFweb brand)

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