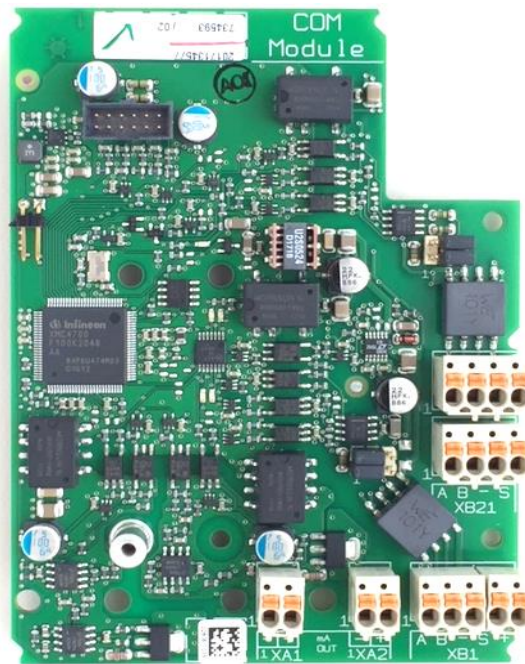


ADDENDUM: Aegis II Communication Driver Card

Aegis II



ProMinent®



Industrial Communication Driver Card
"Com Module"

Communication Driver Card Part Number: 734593

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

1. Description
2. Layman's Glossary of terms
3. Multiple Protocols
4. Com Module Installation
5. Pyxis Sensor
6. The RTU Slave Connection
7. Gateway Settings
8. The Inputs and Outputs
9. Gateway Enclosure kits
10. Replacement Parts

1 Description

The ProMinent Industrial Communication Driver card (Com Module) provides the Aegis II 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. A link is provided in the event you need a Gateway manual.

Other Gateways are available from electronics vendors. **These gateway part numbers do not include complete kits. See section 9.**

PFC Part #	Description Link to Gateway manual
1092940	Modbus TCP Slave / Modbus Master – Converter UL Certified (RTA brand) http://www.rtaautomation.com/userguides/BFR3000-NNA1_Userguide.pdf
1092941	Modbus TCP Slave / Modbus Master – Converter (ADFweb brand) http://www.adfweb.com/download/filefold/modbus_TCP_Server_RTU_Master_MN67507_ENG.pdf
1092942	BACnet IP Slave / Modbus Master – Converter UL Certified (RTA brand) http://www.rtaautomation.com/userguides/460MMBS-NNA1_Userguide.pdf
1092943	BACnet IP Slave / Modbus Master – Converter (ADFweb brand) http://www.adfweb.com/download/filefold/mn67671_eng.pdf
1092964	BACnet MSTP Slave / Modbus Master – Converter UL Certified (RTA brand) http://www.rtaautomation.com/userguides/460MMBMS-NNA4_Userguide.pdf
1092965	BACnet MSTP Slave / Modbus Master – Converter (ADFweb brand) http://www.adfweb.com/download/filefold/mn67671_eng.pdf

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.

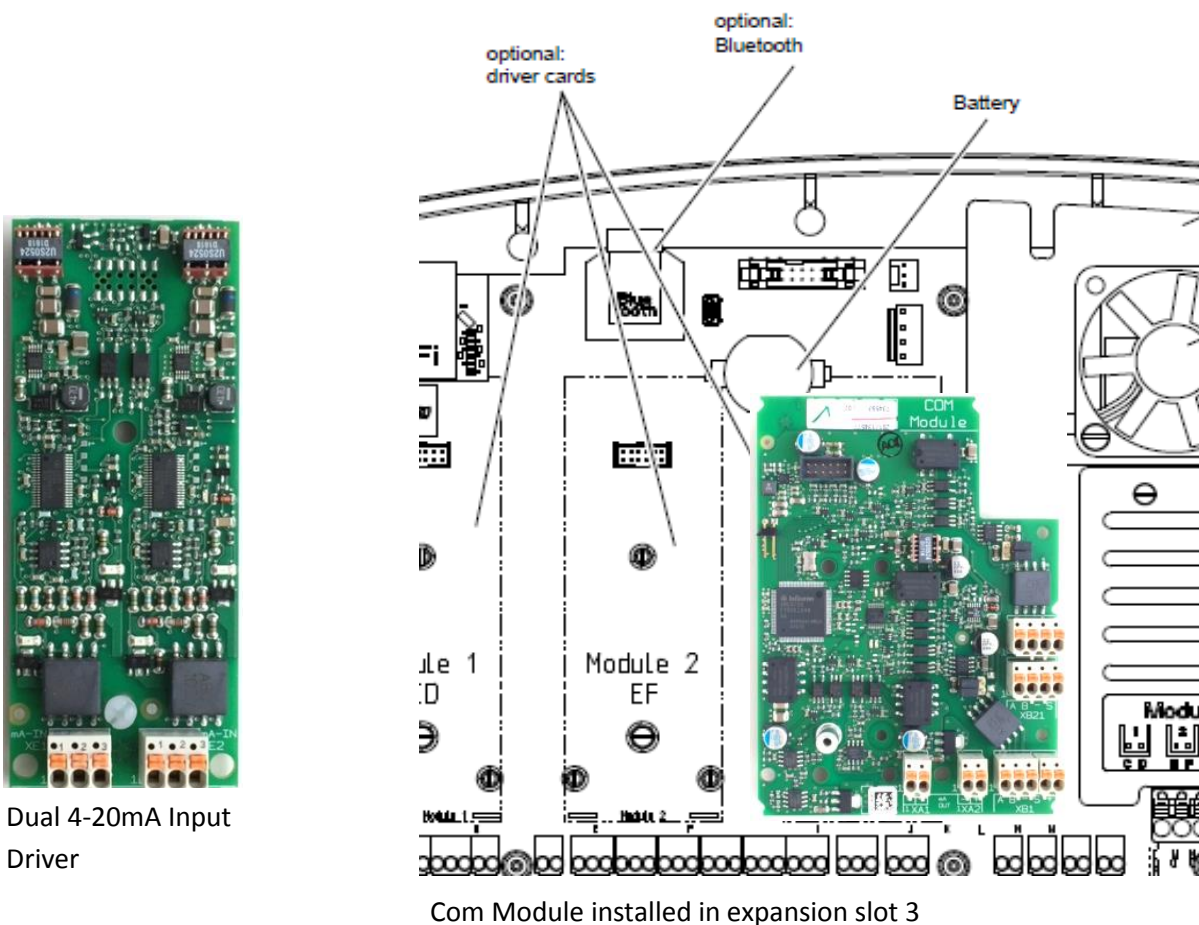
Allen Bradley PCL	ASCII	BACnet/IP Client
BACnet/IP Server	BACnet MS/TP Initiator	BACnet MS/TP Responder
DeviceNet Master	DeviceNet Slave	DF1 Devices
Ethernet/IP Adapter	Ethernet/IP Scanner	Modbus RTU Slave
Modbus TCP/IP Client	Modbus TCP/IP Server	Profibus Master
Profinet Controller	Ethernet TCP/IP	USB

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 or in the feed through slot on the communication driver card. See next page.

When a Com Module is added to expansion slot #3, the dual 4-20mA outputs acquire the identification letters **I** and **J**. These are the letter assignments for any card installed in this slot.

If the dual 4-20mA input driver is installed onto the Com Module, it is represented by the letters **K** and **L**.

The Dual 4-20mA input driver card is the only card that can be added to the Com Module.



Driver card installed on Com module

The Wiring Terminal Table shows all connections to the Com Module

Wiring Terminal Table:

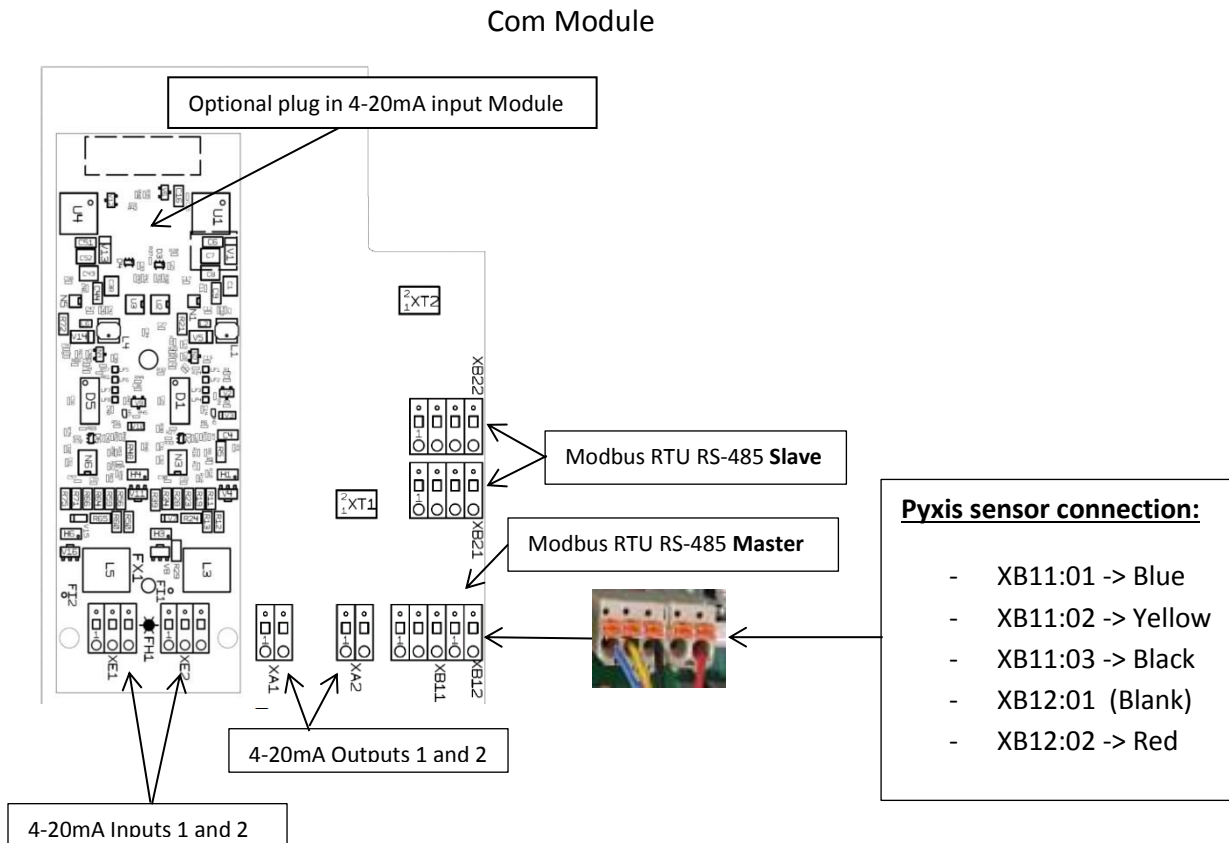
Component	Function	Description	Connection
XT1	Modbus RTU Master to ext. Slave (For Pyxis)	resistor jumpers Def: Failsafe	 Failsafe termination
XT2	Modbus RTU Slave to ext. Master For Gateways and direct connection	resistor jumpers Default: Standard?	 Standard termination or SW control  No termination (park position)
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)
XB22	Modbus RTU Slave to ext. Master		Pin 2 = (B) Pin 3 = (GND) Pin 4 = (shield)
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 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:**"

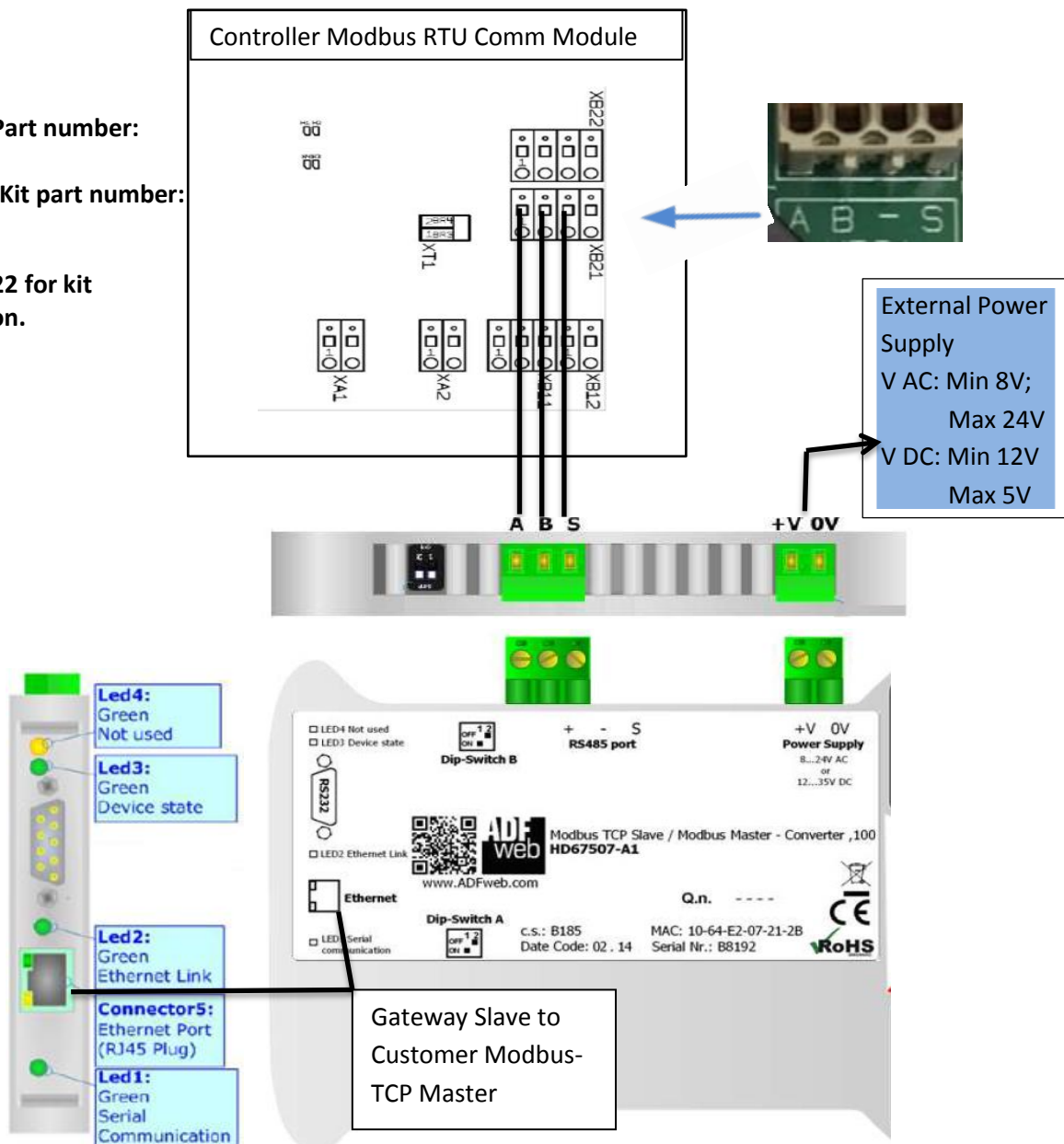
Gateway Part number:

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:"

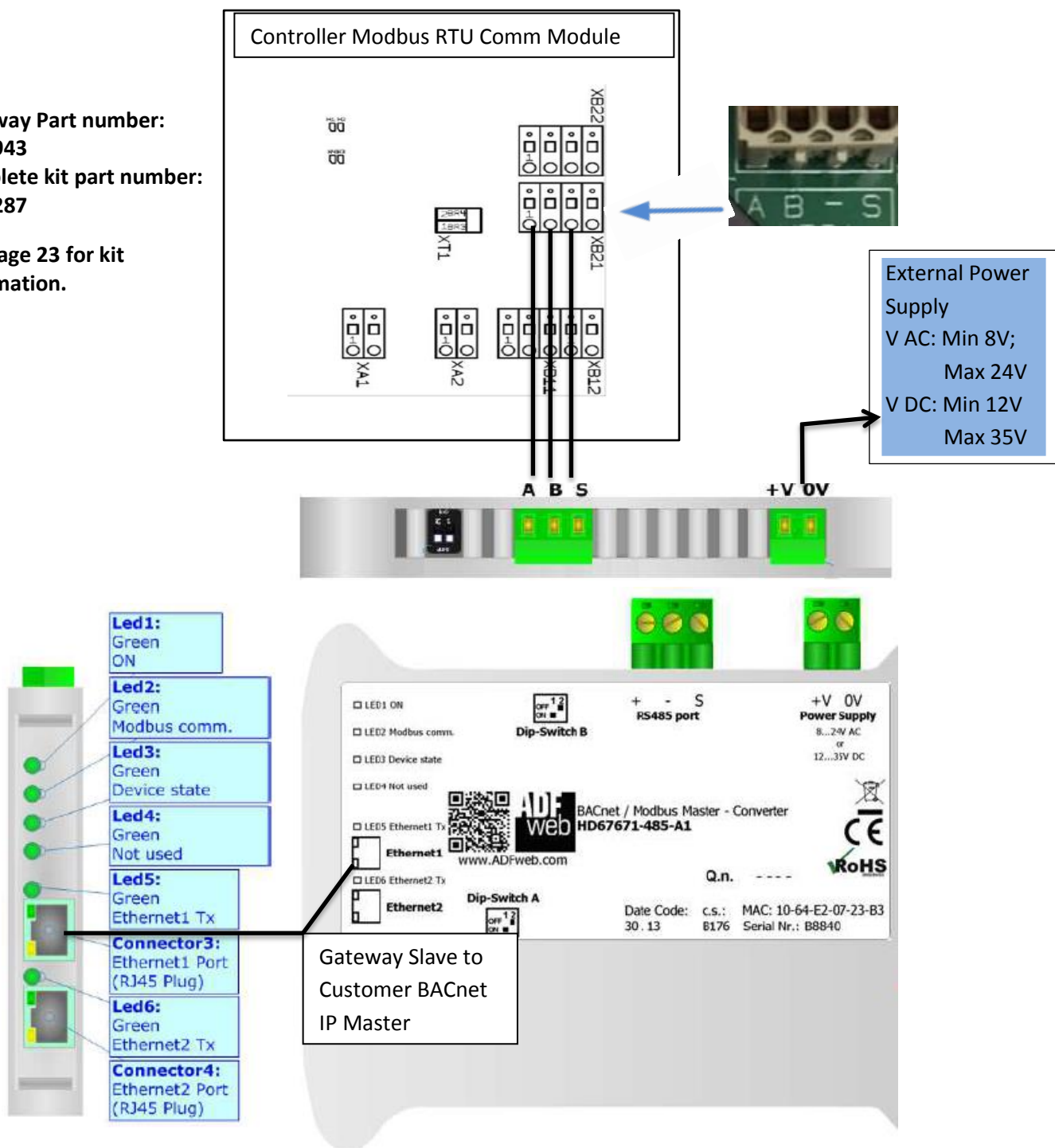
Gateway Part number:

1092943

Complete kit part number:

1094287

See page 23 for kit information.



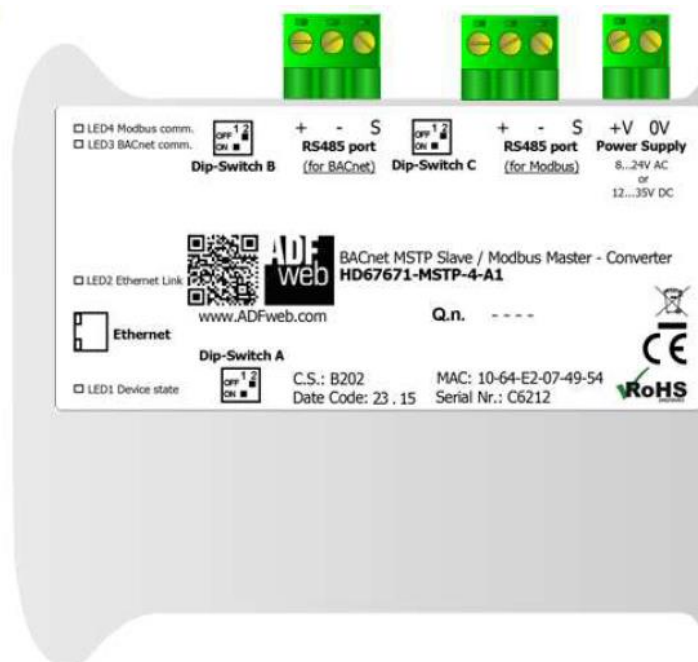
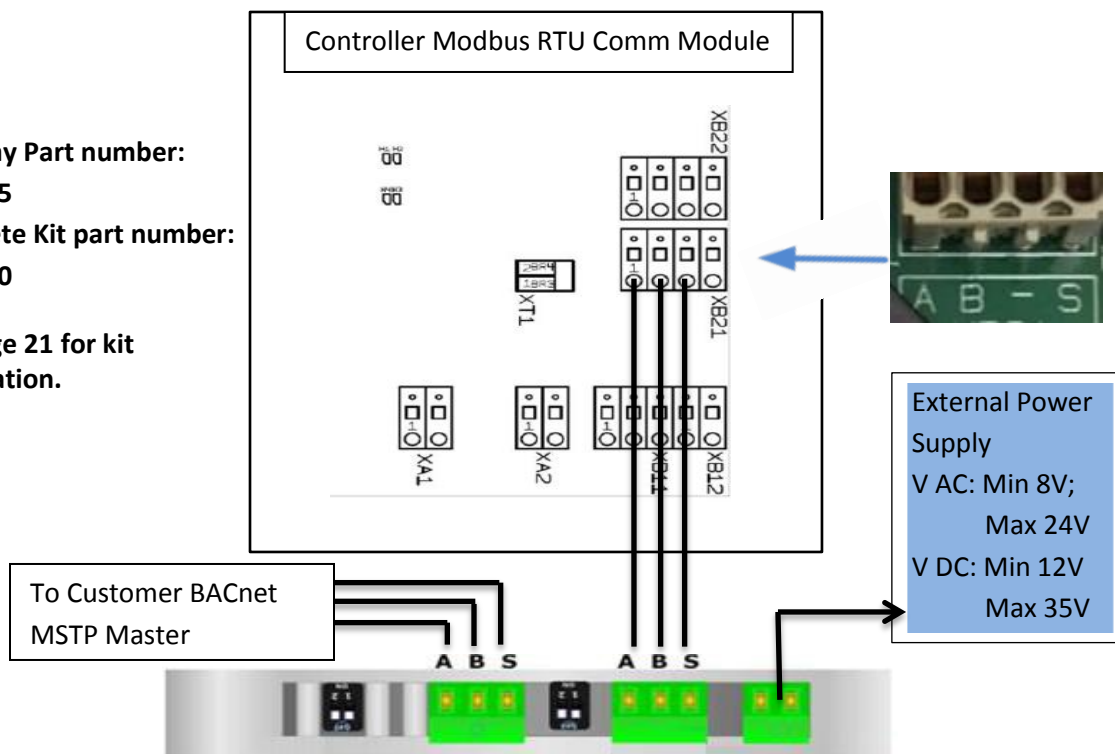
(Description explanation: 'BACnet MSTP Slave' is the Gateway's connection to the plant master via Serial wiring. 'Modbus Master' describes the Gateway's serial master to the communication card slave.)

To load Configuration please refers to manufacture instruction manual MN67671 ENG section

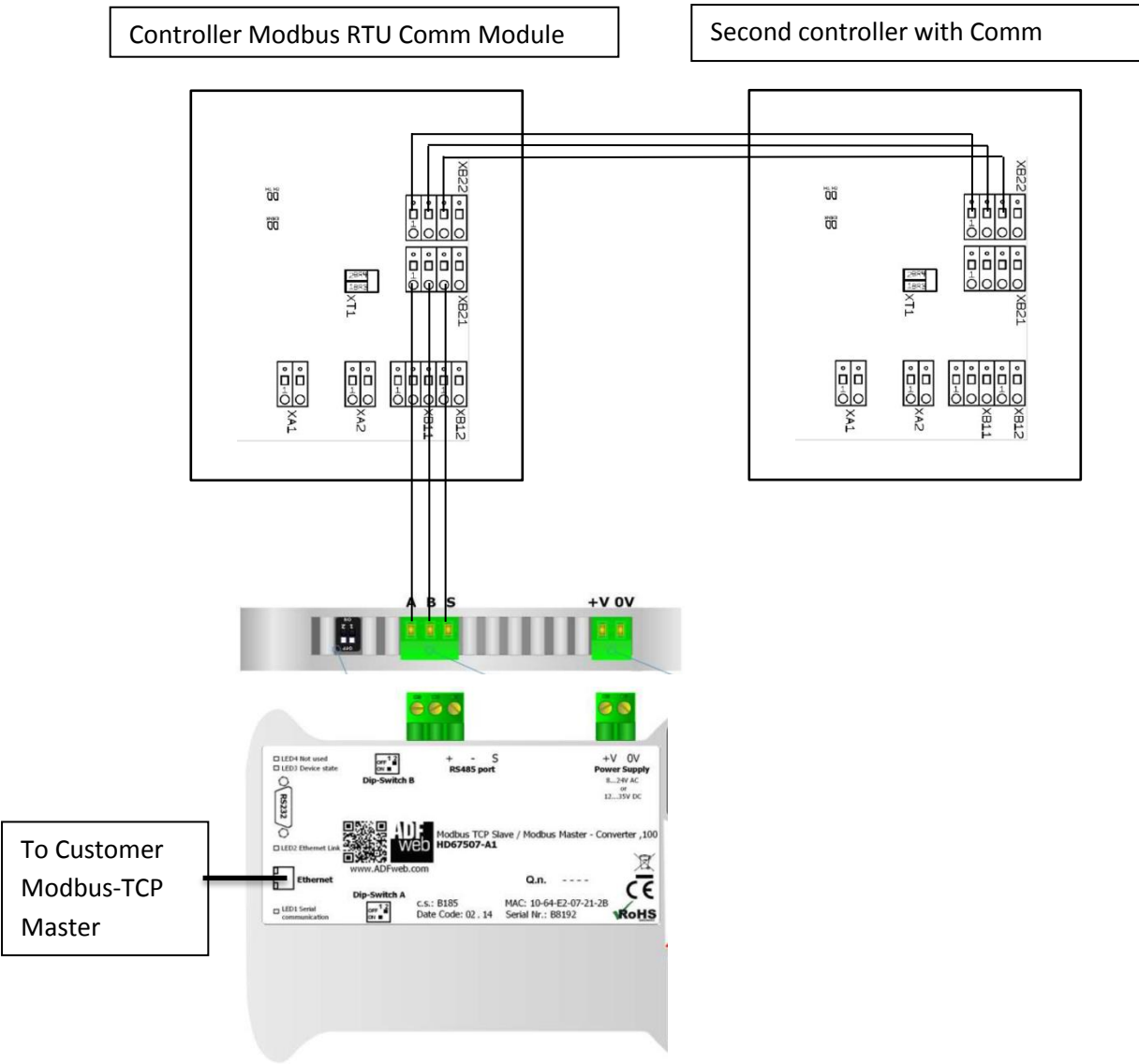
Gateway Part number:

Complete Kit part number:

See page 21 for kit information.



Daisy Chain Example:



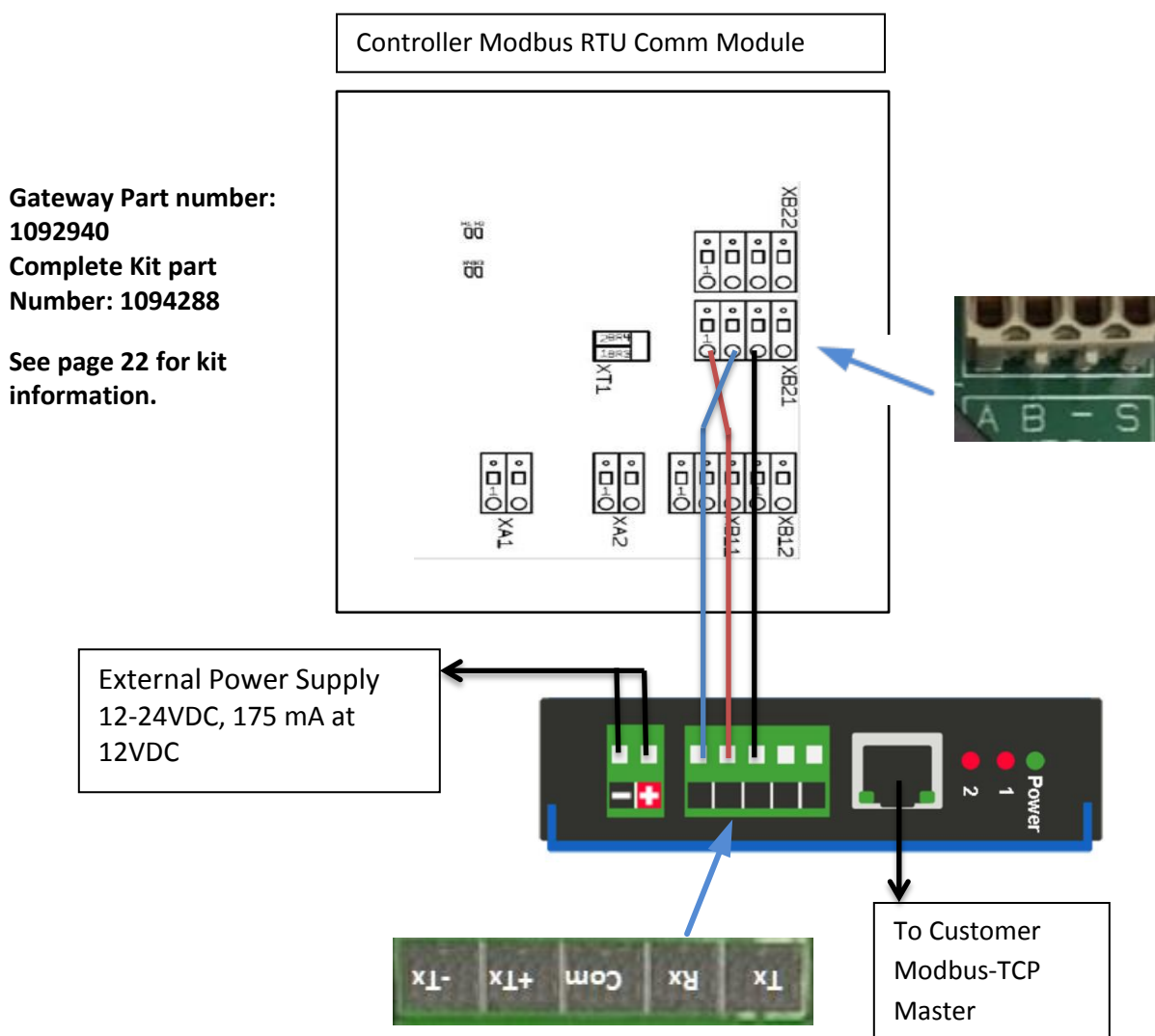
The RTA brand, UL approved models are shown here. Refer to manufacturer instructions for more detail.

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.)

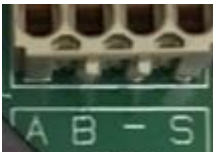
Wiring the gateway terminal to Com card: +Tx to XB21 pin 1 (A), -Tx to pin 2 (B), Com to pin 3 (Shown as a dash).

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



(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.)

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



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.

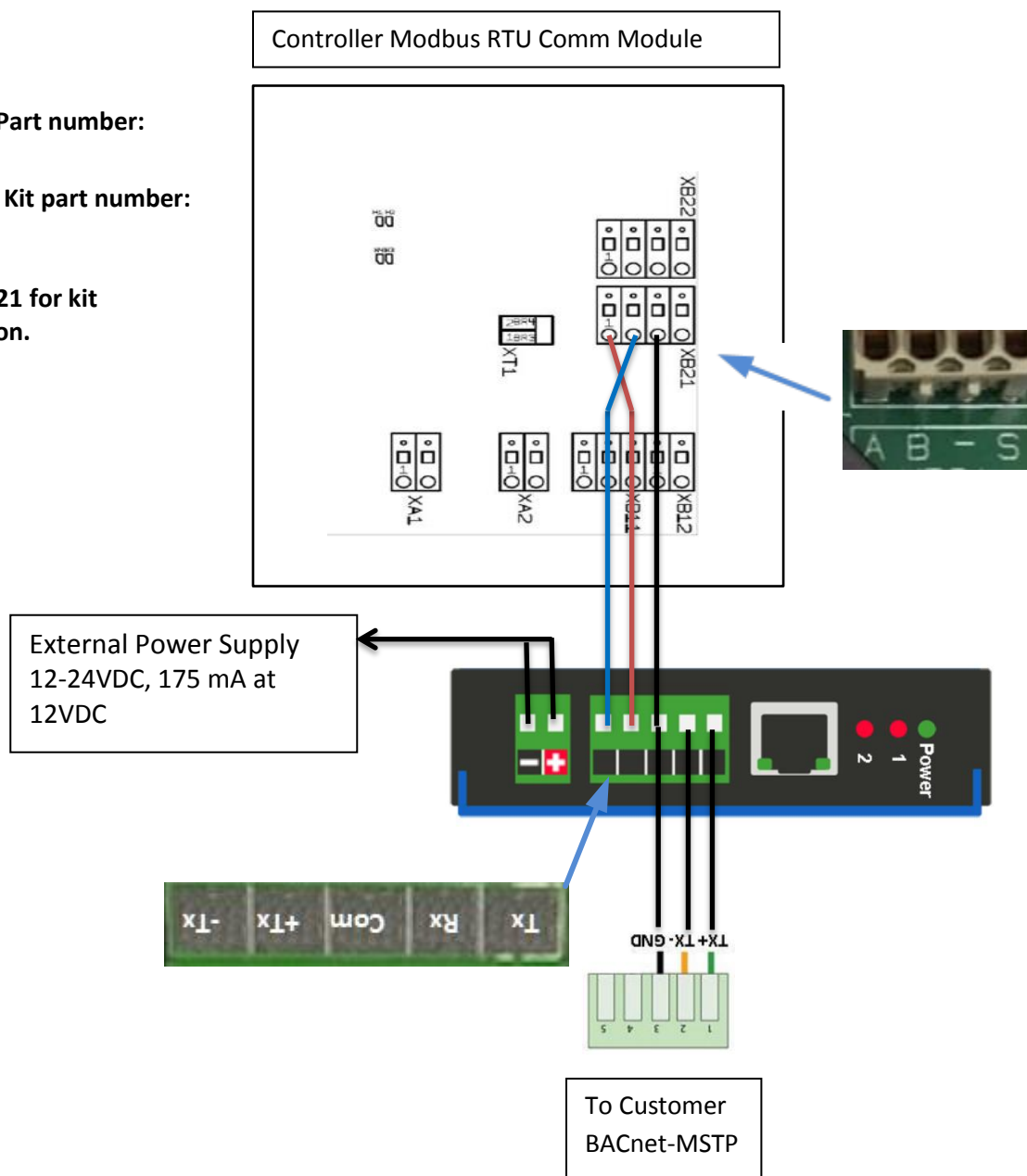
Gateway Part number:

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 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 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: In order for your customer to have access to all Modbus registers in the Aegis II controller, you will need to have a Modbus driver card with firmware version 1.0.23.0 or newer and Aegis II controller firmware 18.04.14.00 (2018/April/14) or newer.

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'
C_forcedon	0x00000400	prebleed has turned relay ON
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
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

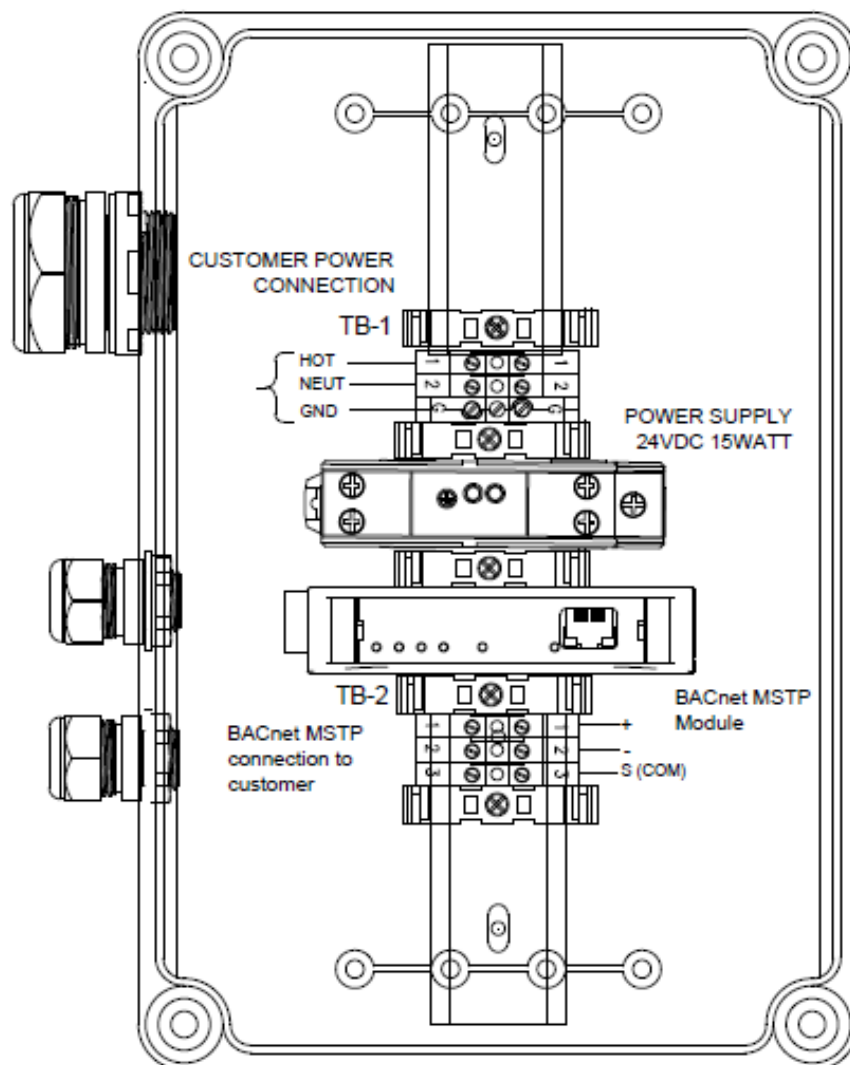
Kits include the gateway, a 24VDC power supply, serial terminations mounted in a Nema 4X enclosure.

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

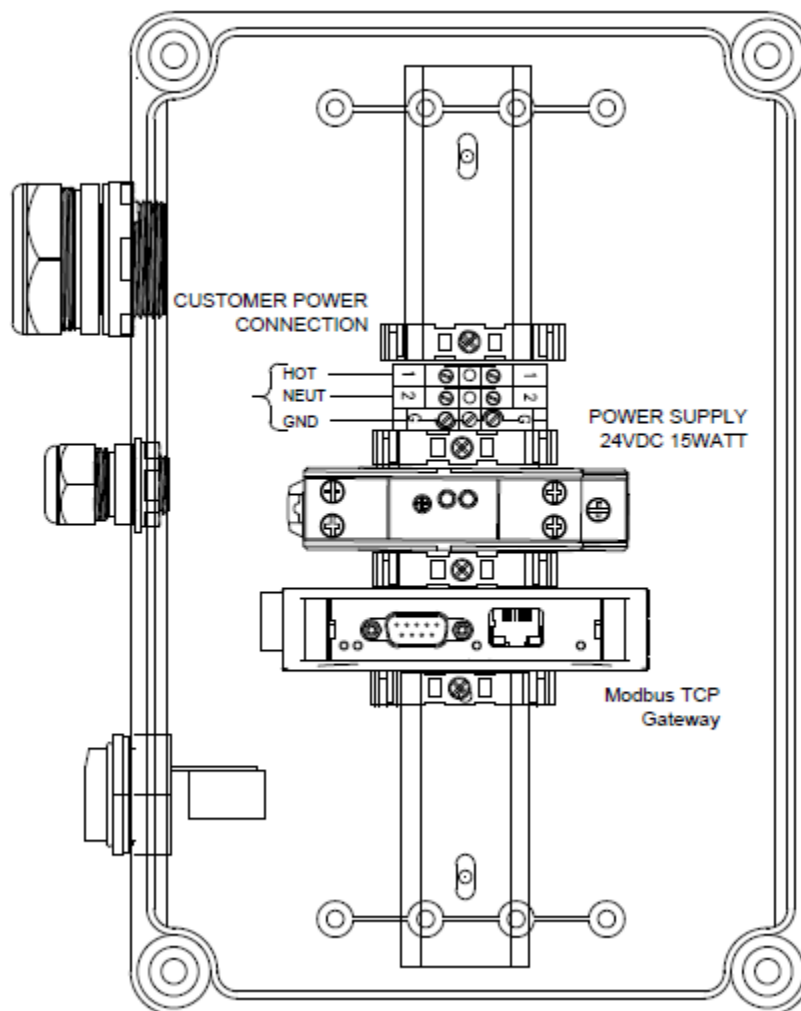


MODBUS TCP Converter Terminal Box

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

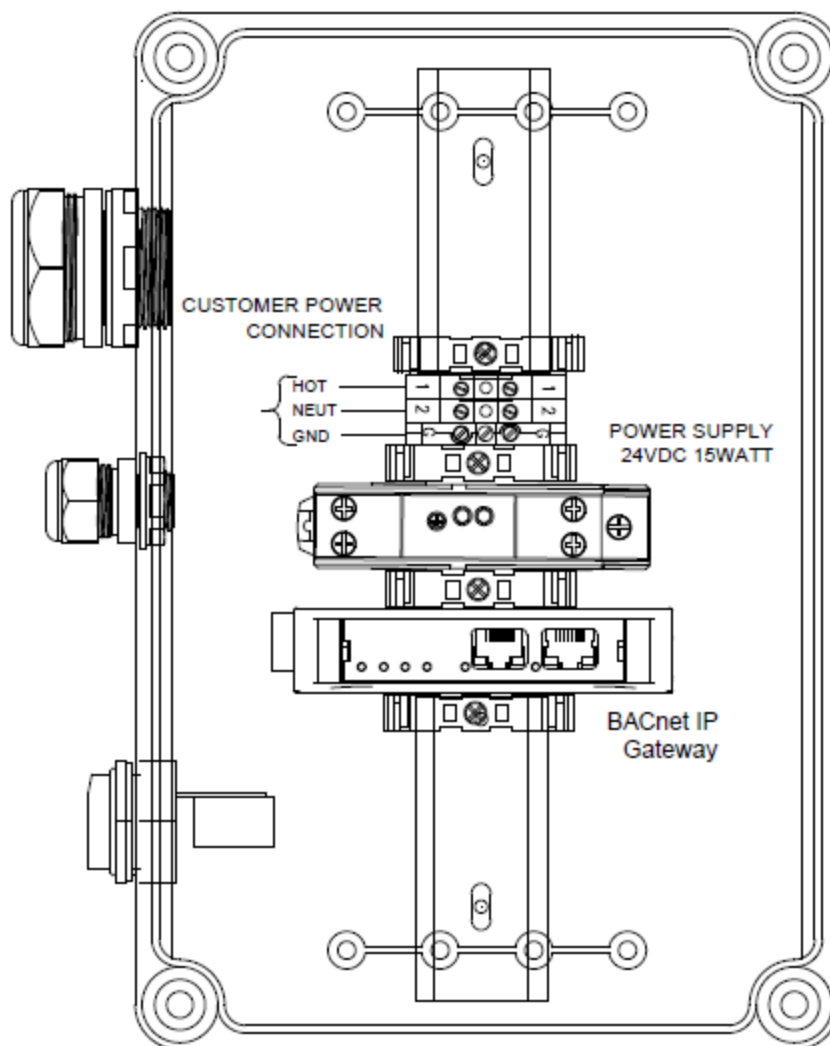


BACnet IP Converter Terminal Box

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.

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

11 Technical Support

If the communication link is not working, refer to this checklist.

Try to swap the serial connection

Are the wires connected to the correct terminals?

Do the default settings listed on page 14 agree with the controller's System Configure page?

Do these settings agree with the Gateway or other Master settings?

Addresses must not be the same

If using a gateway, did you load a configuration into the gateway according to the manufacturer's instruction?

Can you test the Master line with another Slave?

Test the Com Module using the instructions in section 12: Communication Module Register Test

12 Communication Module Register Test

Test the Modbus registers via the Com Module on an Aegis II using a **TTL/RS485 USB dual function dual protection USB turn 485 module FT232 chip module.**



Converter Module



Printer style USB cable

You will need the converter module, a Printer USB cable and Fenix or similar software.

You can purchase this converter module from NewEgg.com. Use the link below.

You will also need a Printer style USB cable. (Note the USB port on the card).

https://www.newegg.com/Product/Product.aspx?Item=9SIAAZM4RC0009&ignorebb=1&nm_mc=KNC-GoogleMCP-PC&cm_mmc=KNC-GoogleMCP-PC_-pla_-EC+-+Test+%26+Measurement_-9SIAAZM4RC0009&gclid=EAIaIQobChMIxvql-5yP2gIVgj2BCh0xwQ6IEAkYDiABEgILKvD_BwE&gclsrc=aw.ds



TTL/RS485 USB dual function dual protection USB turn 485 module FT232 chip module

Be the first to review this product... Ask Or Answer A Question [SHARE](#)

In stock. Ships from China. Most customers receive within 3-10 days.

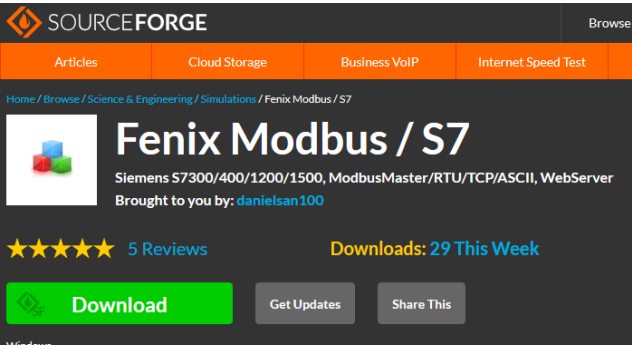
Sold and Shipped by **Axe-Tech**

International Seller **First From ASIA™**

- TTL/RS485 USB dual function dual protection USB turn 485 module FT232 chip module

Download Fenix Software. Use this link:

https://sourceforge.net/projects/fenixmodbus/?source=typ_redirect

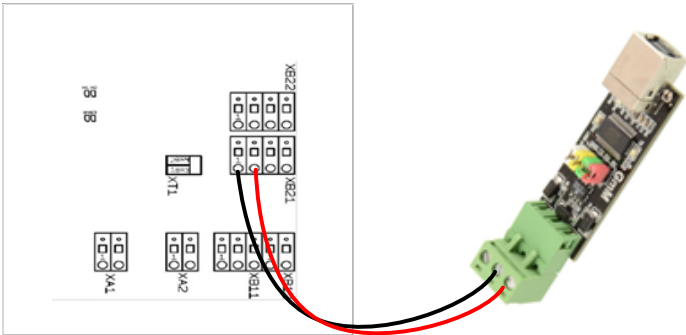


Press the Green Download button.

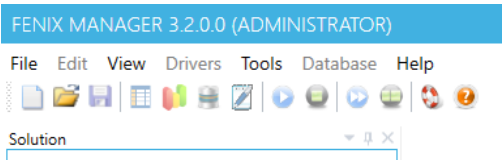
You may need IT permission to install the Fenix program on your company laptop. Check with your company IT department!

Connect as shown.

Use the Printer style USB cable to connect the converter to your PC.



Open the Fenix software on the PC.



Create a new project.

ADD PROJECT



Project Name *

Autor

Company

Description

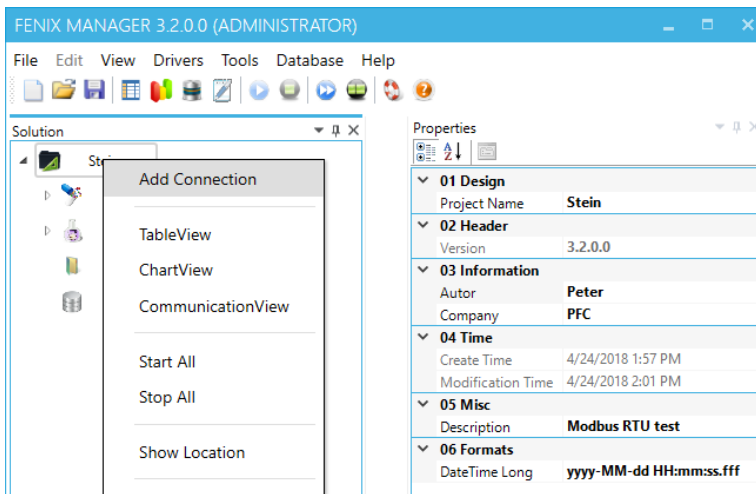
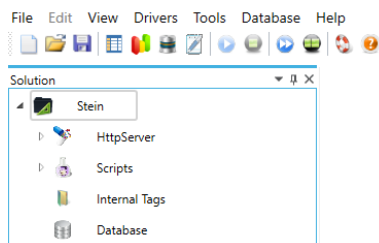
☒ **Apply Http Templates**

SAVE

CLOSE

Fill in the project page. Press Save.

Create a directory to store your project. Ex: C:\Users\peters\Documents\Controllers\Software\Fenix 3.0.8\Projects and supply a name.



Select **Add Connection**. Provide a name, choose Modbus Master RTU for driver name, and all settings as below. The COM port will depend on how your PC chooses this device. Use your Device Manager to look at the USB connections when you plug in the cable. Press OK. (Hint: Type 'device manager' in your search box)

ADD CONNECTION

Connection Name
Office

Driver Name
Driver: ModbusMasterRTU

COM Settings

Baud Rate[B/s]	19200
Data Bits	8
Parity	Even
Port Name	COM4
Reply Time [ms]	1500
Stop Bits	One
Timeout [ms]	1000

Right click on the Connection you created and select **Add Device**.

Solution

- Stein
 - HttpServer
 - Scripts
 - Internal Tags
 - Database
 - Office

Properties

- 01 Design**
 - Connection Name: Office
 - IsBlocked: False
- 02 Driver**
 - Name: ModbusMasterRTU
- 03 Data**
 - Parameters

Name the device based on where the Com Module is located. Use the controller System Communication properties to find the Device Address and enter it here.

ADD DEVICE

Name
Aegis II

Device Address
10

Solution

- Database
- Office

Add Tag

Add all pertinent I/O points using **Add Tag** from the Device menu.

The starting address is 501 (which stands for 500 and 501). Consult section # 8 Inputs and Outputs for a list of I/O points.

Input A is 501, B is 503, C is 505 etc.

ADD TAG

Add Range

Tag Name*

Conductivity

DataType*

FLOAT

Bytes Order

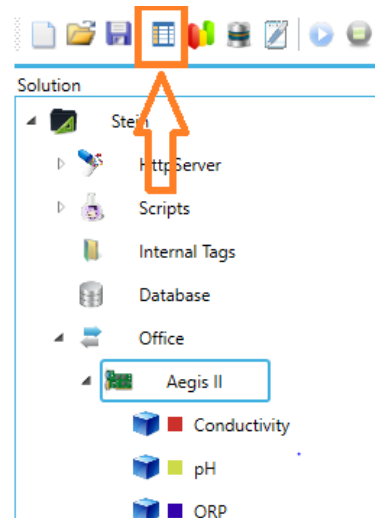
DCBA

Data Area*

HoldingRegisters [16]

DB

DB	Address	Offset [bit/byte]
0	501	



Select the Table View icon to view the I/O

Highlight the Connection (Office in my example) and use the start and stop icons to run/stop the data acquisition.

Solution

Stein

- HttpServer
- Scripts
- Internal Tags
- Database
- Office [Running]
- Aegis II [Running]
- Conductivity [Running]
- pH [Running]
- ORP [Running]

COLOR	CHARTVI	WIDTH	TAG NAM	DB	START	BIT / BYT	DATA TYI	MEMORY	BYTES OF	VALUE	PROGRES	SET VALU
Red	☒	2	Conductivit	0	501	0	FLOAT	Holdir	DCBA	0.10		
Green	☒	2	pH	0	509	0	FLOAT	Holdir	DCBA	-17.53		
Blue	☒	2	ORP	0	511	0	FLOAT	Holdir	DCBA	732.78		

Save your Project at this point. If you forget, all will be lost.

Next session, select Open rather than New.

ProMinent Fluid Controls, Inc.
136 Industry Drive
Pittsburgh, PA 15275-1014
412.787.2484
www.proMinent.us