ProtoCessor

FieldServer Technologies

A Sierra Monitor Company

1991 Tarob Court

Milpitas, CA 95035 USA

Toll Free: 800-317-8319

Telephone: 408-964-4433

Fax: 408-964-4425

Email: sales@ProtoCessor.com

ProtoCessor Getting Started

APPLICABILITY & EFFECTIVITY

Explains the Configuration of the ProtoCessor.

The instructions are effective for the above as of January 2010

Instruction Manual Part Number: T17007
Rev.A3

TABLE OF CONTENTS

1 INTRODUCTION

The ProtoCessor Product line is comprised of 3 product families:

- ProtoCessor Embedded modules – TTL to Serial, Ethernet, and LonWorks
- ProtoCarrier Daughter cards – These cards are equipped with an RS485 or an RS232 port and a TTL ProtoCessor socket to support any of our ProtoCessor modules in Section 2. BACnet BTL certified.
- ProtoNode External Protocol Gateways – 2 Models
    - ProtoNode RER - 2 RS485 ports and 1 Ethernet port. BACnet BTL certified
    - ProtoNode LER - 1 RS485 port and 1 Ethernet port.

BACnet International BTL certification is the highest level of BACnet conformance tests that a product can be subjected to. Our ProtoCessor family has been subjected to the BTL tests. The ProtoCessor FFP-485 is used in both the ProtoCarrier and the ProtoNode RER solutions. These 2 products received BACnet BTL certification. The FFP-485 used by itself could not receive BTL certification because the data link communications differ on each OEM device from the ProtoCarrier or ProtoNode. When selling the modules separately to OEM customers, we use the same ProtoCessor and BTL certified code that is used in the ProtoCarrier and ProtoNode.

ProtoCarrier-RS485 and FFP-485 and ProtoNode RER both are BTL certified and carry the BTL certification Logo. http://www.bacnetinternational.net/btl/

- ProtoNode LER is pending BACnet BTL certification.

To receive a free evaluation copy of Chipkin Automation's (www.chipkin.com) BACnet CAS Explorer for testing, please contact Support@ProtoCessor.com and request a copy.

2 PROTOCESSOR HARDWARE

FFP-ETH ProtoCessor[1]

Ethernet port for Field protocol support and Diagnostics

ProtoCessor TTL Socket - Supporting RX and TX signals – 5Vdc

FFP-232 ProtoCessor

RS-232 DB-9 port for Field serial protocol support

Old Style FFP-485 ProtoCessor

Inserting jumper J8 provides a termination resistor across the RS-485 connection

Ethernet port for Diagnostics and Host or Field protocol support

RS-485 port for Field serial protocol support

New Style FFP-485 ProtoCessor

DIP switch sets RS485 end of line termination resistor

DIP switches set MAC Address, Baud Rate, and Node ID for RS485 field Protocol

Reset button

FFP-LON ProtoCessor

LonWorks-FTT-10 port (2-wire) for Field Lon protocol support

Ethernet port for Diagnostics and Host or Field protocol support

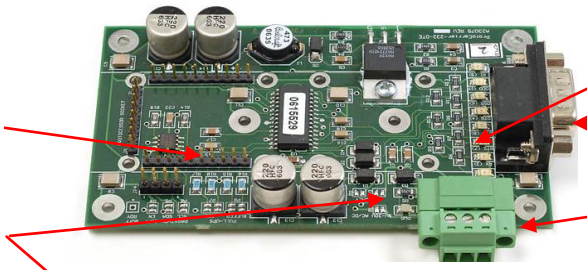
LonWorks Service Pin

ProtoCessor TTL Socket - Supporting RX and TX signals – 5Vdc

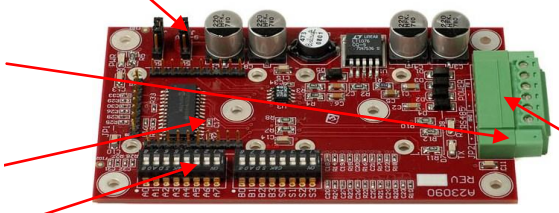
[1] The FFP-ETH module needs to be placed in the ProtoCessor Socket in the same direction that the other field connectors face (green connectors).

3 PROTOCARRIER HARDWARE

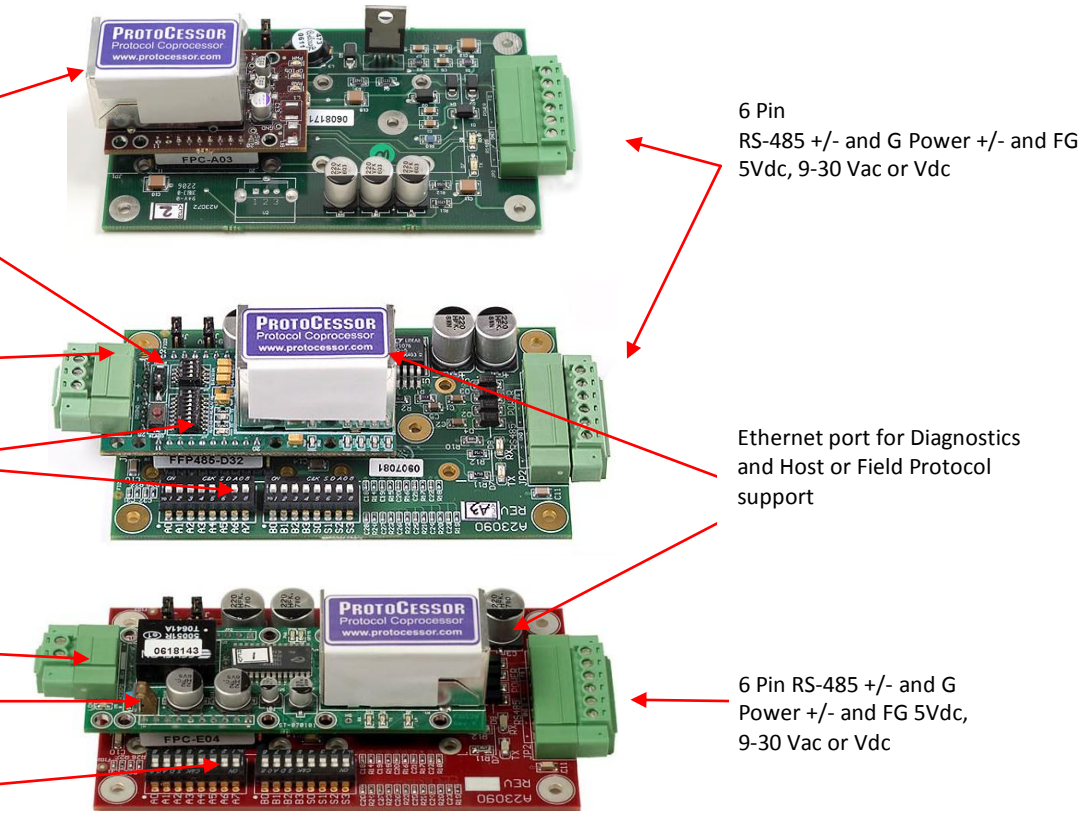
ProtoCarrier 232



ProtoCarrier 485



ProtoCarrier 485 with ProtoCessors



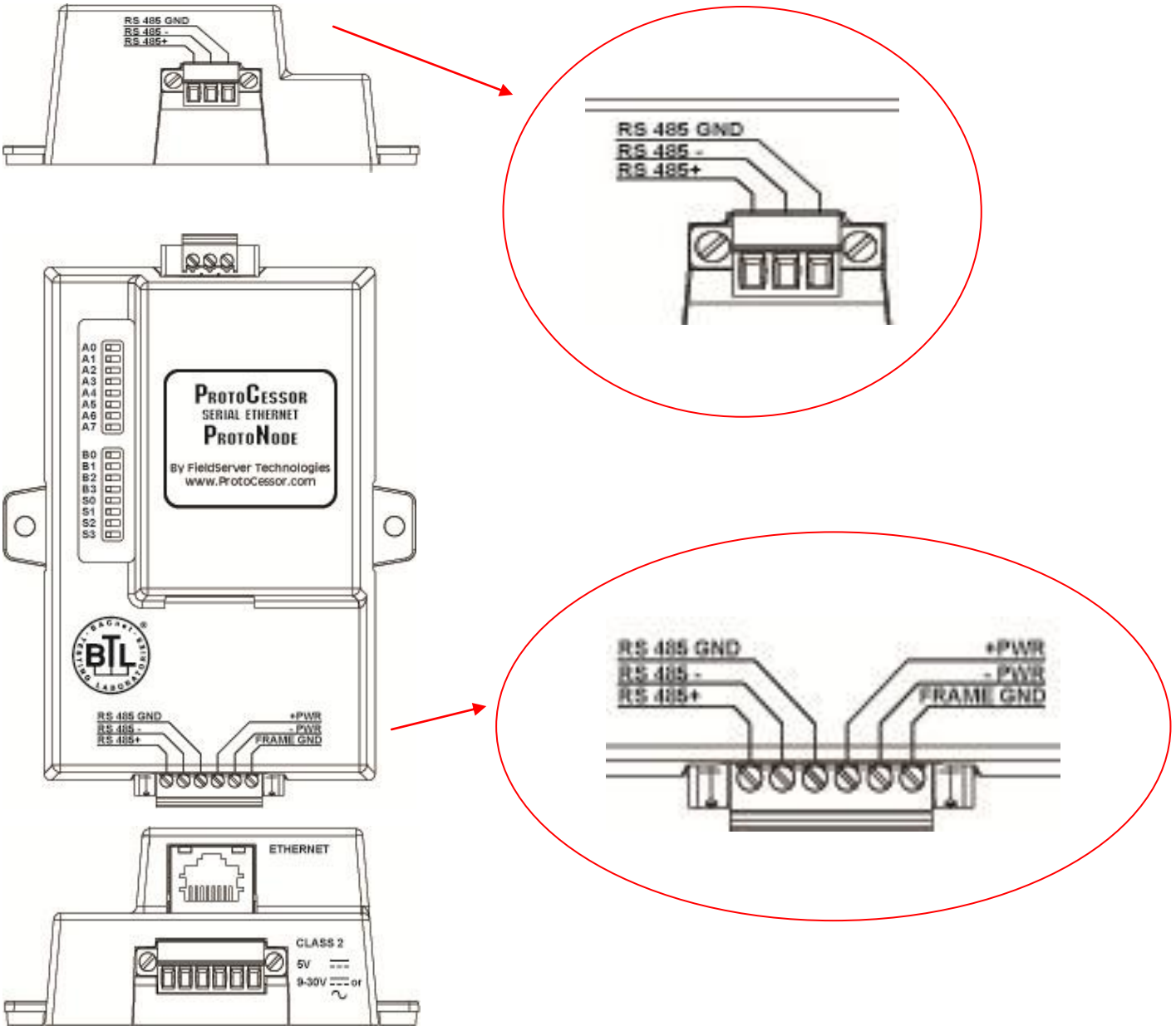
- ProtoCessors need to be mounted to the ProtoCarriers, as they appear above.
- ProtoCarrier 232 and 485 power default setting is 9-30 Vac or Vdc.

4 PROTONODE RER AND LER HARWARE AND CONNECTIONS

ProtoNode RER and LER are based on the ProtoCessor/ProtoCarrier platform.

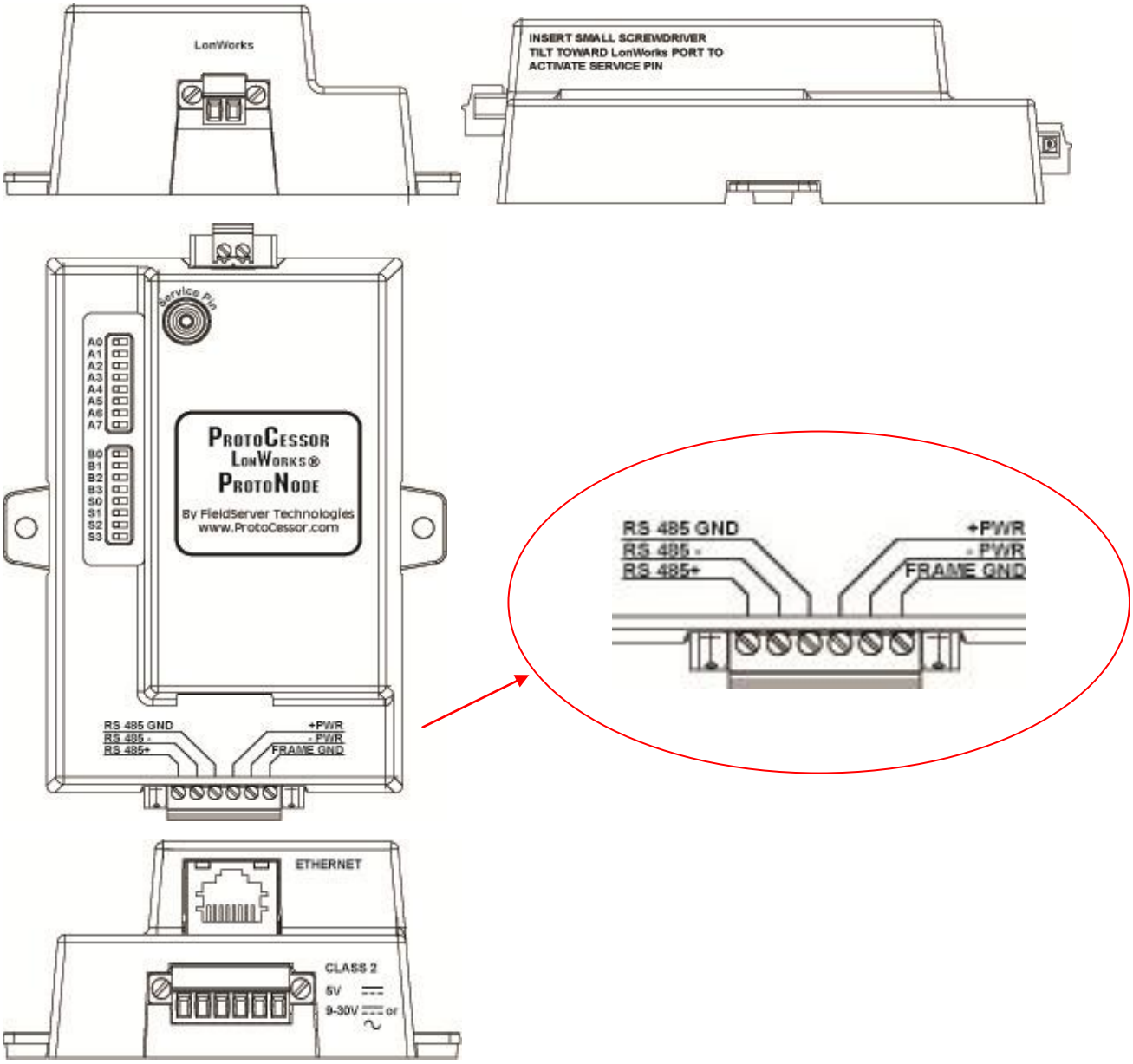
- The DIP switches on the ProtoNode RER and LER allow users to set the Baud Rate, Node-ID, and MAC address on the Field RS-485 protocol.
- The following diagrams describe the wiring to connect up the Host, Field, and power connections.
    - 5Vdc or 9-30 Vac or Vdc. The default power setting is 9-30 Vac or Vdc.

4.1 ProtoNode RER – 2 Serial RS485 ports and 1 Ethernet port.



4.2 ProtoNode LER – 1 Serial RS485, 1 LonWorks, and 1 - 10/100 Ethernet port.

To commission the ProtoNode LER LonWorks port, insert a small screw driver in the commissioning hole on the face of the LER's enclosure to access the Service Pin. See the illustration on the ProtoNode LER as to which way to toggle the screw driver during commissioning.

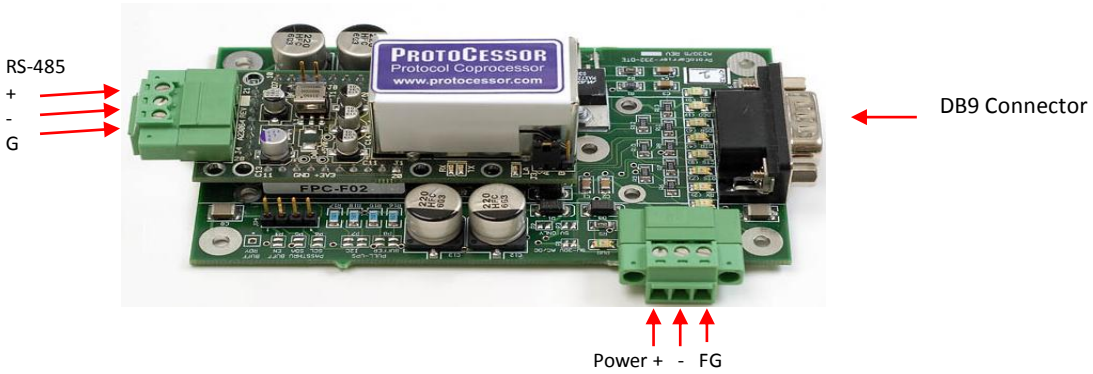


4 TESTING PROTOCESSOR FFP (FULL FUNCTION PROTOCESSOR UNIT):

- Download the FieldServer utilities from the Tech Support/Download section at www.protocessor.com.

4.1 Connection using RS-232 ProtoCarrier

- Refer to the ProtoCarrier Manual for the connections. Plug the ProtoCessor into the ProtoCessor socket on the ProtoCarrier board. The FFP's Field Connection is placed on the opposite side of the DB9 connector (see below).
- The DB9 connector on the RS232 board connects to the serial port on a third party device.



4.2 Connection using RS-485 ProtoCarrier

- The ProtoCarrier-485's 6 pin green connector, connects to the serial RS485 port on a third party device and Power. The pinouts for the 6 connector are located at the base of the 6 pin connector. Also see below for the pin-outs reguarding how to wire the serial RS485 port and Power.
- See below to wire up the serial RS485 port on the protocessor

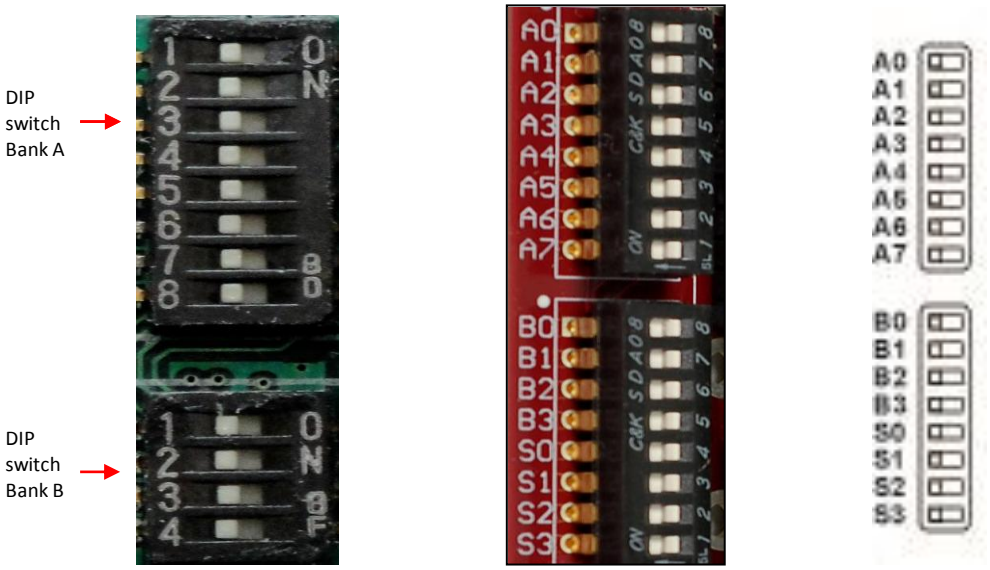
4.3 Configuration of the Dip Switches

The DIP switches for the ProtoCessor FFP-485, ProtoCarrier 485, and ProtoNode RER/LER are not enabled by default. They can be enabled before the unit ships out of the FieldServer Factory or they can be enabled in the field by editing the configuration file. Refer to ProtoCessor Configuration manual for information on how to do this.

4.4 Physical Setting of the Dip Switches

Dip switches are numbered slightly differently on the different models as described below:

FFP-485 **ProtoCarrier 485** **ProtoNode RER/LER**



- The S bank of DIP switches on the ProtoCarrier 485 and ProtoNode are not functional and are reserved for future functionality.
- The DIP switch settings are set the same for the ProtoCessor FFP-485, the ProtoCarrier 485, and ProtoNode RER/LER (see 4.3.2).

4.4.1 DIP Switches for the ProtoCessor FFP-485, ProtoCarrier 485, and ProtoNode.

The physical DIP switch settings are the same for the ProtoCessor FFP-485, the ProtoCarrier 485, and ProtoNode LER/LER. Setting of the dip switches for the ProtoCarrier and ProtoNode is described in Sections 4.4.2 and 4.4.3. The same results will be obtained on the ProtoCessor FFP-485 using the equivalent settings as depicted below.

Physical DIP Switch Settings	ProtoCarrier ProtoNode	ProtoCessor FFP-485
Bank A	A0	A1
	A1	A2
	A2	A3
	A3	A4
	A4	A5
	A5	A6
	A6	A7
	A7	A8
Bank B	B0	B1
	B1	B2
	B2	B3
	B3	B4

4.4.2 Using A0 – A7 to set Node ID

Dip switches A0 – A7 can be used to set the Node ID or MAC Address (or both) Dip switch settings for the full range of addresses are tabled in Appendix A.1

A7	A6	A5	A4	A3	A2	A1	A0	Address
Off	Off	Off	Off	Off	Off	Off	On	1
.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	
On	Off	Off	Off	Off	Off	Off	Off	128
.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	
On	On	On	On	On	On	On	On	255

4.4.3 Using B0 – B3 to set Baud Rate

For setting serial field protocol baud rate, the dip switches B0 – B3 can be set for the following speeds.

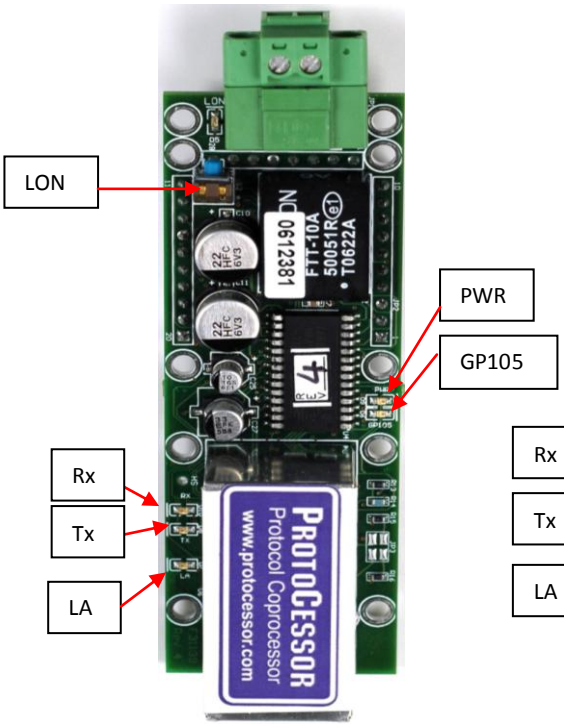
Baud	B3	B2	B1	B0
Auto[2]	Off	Off	Off	Off
110	Off	Off	Off	On
300	Off	Off	On	Off
600	Off	Off	On	On
1200	Off	On	Off	Off
2400	Off	On	Off	On
4800	Off	On	On	Off
9600	Off	On	On	On
19200	On	Off	Off	Off
20833	On	Off	Off	On
28800	On	Off	On	Off
38400	On	Off	On	On
57600	On	On	Off	Off
76800	On	On	Off	On
115200	On	On	On	Off

[2] Auto-baud is only supported for BACnet MSTP

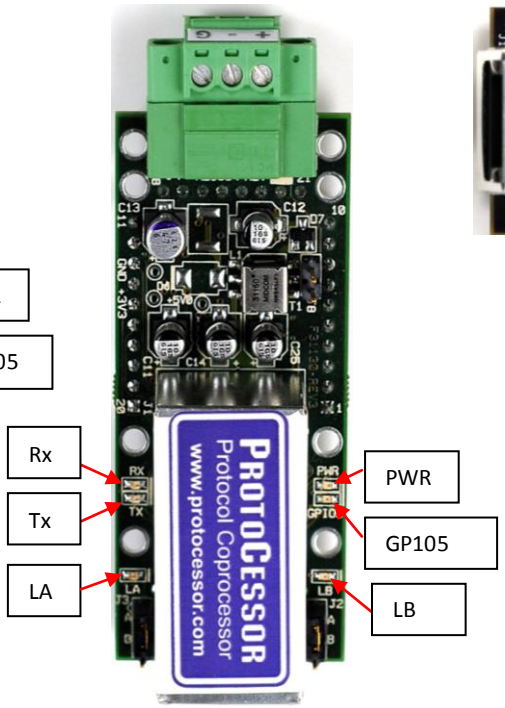
5 POWERING UP THE PROTOCARRIER/PROTOCESSOR.

5.1 Power up process of Processors' LED's:

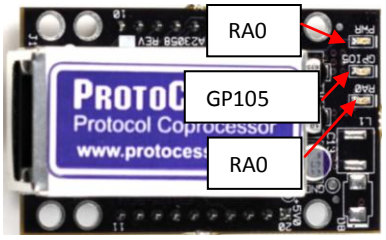
- **Power** LED comes on and remains solid
- **LA-PIC A** (FFP485/232 , FFP-LON models) or RA0 (FFP-ETH) starts flashing about once per second. This tells us that PIC number 1 in the ProtoCessor has powered up successfully.
- **LA-PIC B** (FFP485/232 models) starts flashing about once per second. This tells us that PIC number 2 in the ProtoCessor has powered up successfully.
- **GP105** will go on solid within 45 – 60 seconds after power up, signifying normal operation. ProtoCessor will be able to come up in RUINET (refer to Section 6 for more information) shortly after this LED comes on. During the first 45-60 seconds the LED should be dark.
- Upon successful operation of **GP105 t**he ProtoCessor will go through diagnostics of the field port communications.
- The FFP-ETH module is operational after this point.
- **RX** Field Port LED: On normal operation of FFP-485/232/LON, the **RX** LED will flash when a message is received on the field port of the ProtoCessor.
- **TX** Field Port LED: On normal operation of FFP-485/232/LON, the **TX** LED will flash when a message is sent on the field port of the ProtoCessor.
- **LON** LED: When the unit is fi rst powered up, before commissioning has occurred, this LED will flash. Once the unit is commissioned, the LED will stay off during normal operations



FFP-LON



FFP-485/232



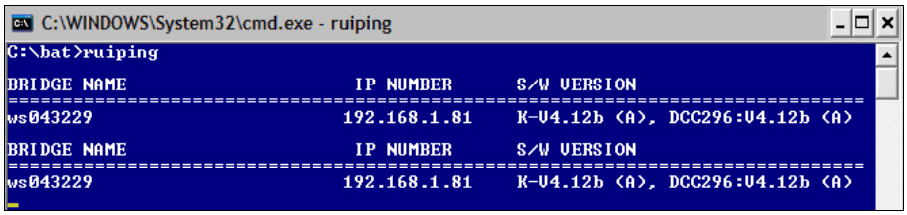
FFP-ETH

5.2 Troubleshooting Tips

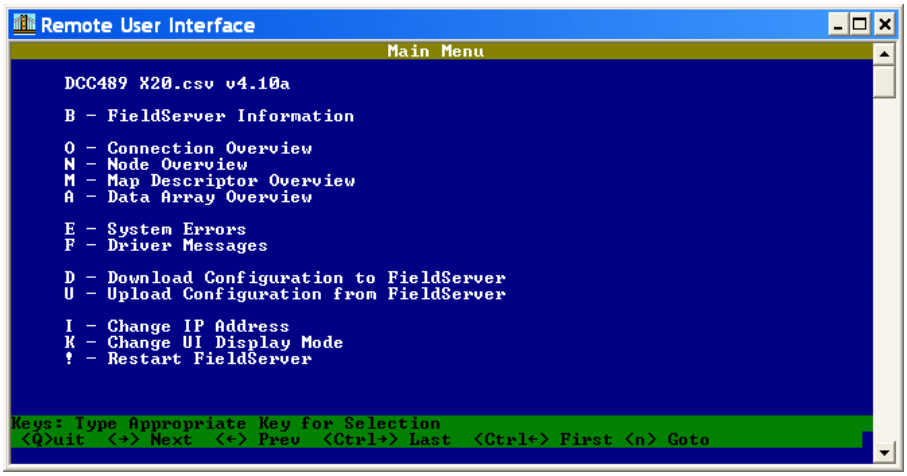
- If **PWR** LED does not come on and LA and LB don't flash, call or email ProtoCessor support support@ProtoCessor.com.
- If **PWR** LED does not come on but the LA and LB flash, then the **PWR** LED is broken.
- If **LA** and **LB** don't start to flash there could be a problem with the ProtoCessor and you need to contact support@ProtoCessor.com . Remember FFP-LON only has **LA** and FFP-485/232 has both LED's.
- If **GP105** never comes on then you need to contact ProtoCessor support.
- If **TX** and or **RX** don't flash, it may represent a problem with the field wiring or Configuration problems in the ProtoCessor on field side or incorrect polling parameters (such as COMM properties like baud, parity, and etc).

6 CONNECTION TO PROTOCESSOR USING UTILITIES

- Connect an Ethernet cross-over cable between the PC and ProtoCessor or connect the ProtoCessor and the PC to the Hub/switch using a straight cat5 cable.
- The Default IP Address of the ProtoCessor **is 192.168.1.24**, Subnet Mask is **255.255.255.0.**
- If the PC and the ProtoCessor are on different IP Networks, assign a Static IP Address to the PC on the 192.168.1.0 network.
- Double click on the "RUIPING" Utility. If the IP Address of the ProtoCessor module appears on the screen, the ProtoCessor is running.



- Double click on the debugging utility, "RUINET[3]" (Remote User Interface). The following screen will appear:



- See the "ProtoCessor Mapping" document to ensure that the device is set up correctly with respect to Baud rate, Node Address, and Points which are configured in the device.
- Select "O" for Connect Overview to see the number of messages on each protocol. If the ProtoCessor is communicating correctly with the device then the display will show Tx and Rx messages without any errors.
- If there are errors on the ProtoCessor socket communications, then the points list in the CSV file will require editing until there are no errors. Each time the points are edited, the CSV will need to be re-downloaded using Ruinet.
- When communication between the device and the ProtoCessor is established the Field Side of the ProtoCessor may be connected to the appropriate device/software. Ensure that the Field Side parameters on the device/software are set up as per the "ProtoCessor Mapping" document.
- Read and Write data from each side and make sure the ProtoCessor works as expected.

[3] A user manual for the Ruinet Utility is available at the Tech Support/Download section at www.protocessor.com.

7 CONFIGURING THE PROTOCESSOR:

The default driver configuration file (CONFIG.CSV) for any driver combination ordered is loaded into the ProtoCessor and can be retrieved using the Remote User Interface Utility (see the FieldServer Utilities Manual for more details). This file should be used as a template when editing configuration files to ensure that the edited file takes the correct form. Refer to the ProtoCessor Configuration Manual for further information on ProtoCessor configuration. This manual is available at the Tech Support/Download section at www.protocessor.com.

Appendix A. Reference

Appendix A.1. Address Dip Switch Settings

B7	B6	B5	B4	B3	B2	B1	B0	Address
Off	Off	Off	Off	Off	Off	Off	Off	0
Off	Off	Off	Off	Off	Off	Off	On	1
Off	Off	Off	Off	Off	Off	On	Off	2
Off	Off	Off	Off	Off	Off	On	On	3
Off	Off	Off	Off	Off	On	Off	Off	4
Off	Off	Off	Off	Off	On	Off	On	5
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Off	Off	Off	Off	On	Off	Off	Off	8
Off	Off	Off	Off	On	Off	Off	On	9
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B7	B6	B5	B4	B3	B2	B1	B0	Address
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Off	On	Off	On	Off	Off	On	Off	82
Off	On	Off	On	Off	Off	On	On	83
Off	On	Off	On	Off	On	Off	Off	84
Off	On	Off	On	Off	On	Off	On	85

B7	B6	B5	B4	B3	B2	B1	B0	Address
Off	On	Off	On	Off	On	On	Off	86
Off	On	Off	On	Off	On	On	On	87
Off	On	Off	On	On	Off	Off	Off	88
Off	On	Off	On	On	Off	Off	On	89
Off	On	Off	On	On	Off	On	Off	90
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B7	B6	B5	B4	B3	B2	B1	B0	Address
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On	Off	Off	On	Off	On	On	On	151
On	Off	Off	On	On	Off	Off	Off	152
On	Off	Off	On	On	Off	Off	On	153
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On	Off	Off	On	On	Off	On	On	155
On	Off	Off	On	On	On	Off	Off	156
On	Off	Off	On	On	On	Off	On	157
On	Off	Off	On	On	On	On	Off	158
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On	Off	On	Off	On	On	Off	On	173
On	Off	On	Off	On	On	On	Off	174
On	Off	On	Off	On	On	On	On	175

B7	B6	B5	B4	B3	B2	B1	B0	Address
On	Off	On	On	Off	Off	Off	Off	176
On	Off	On	On	Off	Off	Off	On	177
On	Off	On	On	Off	Off	On	Off	178
On	Off	On	On	Off	Off	On	On	179
On	Off	On	On	Off	On	Off	Off	180
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On	Off	On	On	Off	On	On	Off	182
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On	Off	On	On	On	Off	Off	On	185
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On	On	Off	On	On	Off	On	Off	218
On	On	Off	On	On	Off	On	On	219
On	On	Off	On	On	On	Off	Off	220

B7	B6	B5	B4	B3	B2	B1	B0	Address
On	On	Off	On	On	On	Off	On	221
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On	On	Off	On	On	On	On	On	223
On	On	On	Off	Off	Off	Off	Off	224
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On	On	On	On	On	On	Off	On	253
On	On	On	On	On	On	On	Off	254
On	On	On	On	On	On	On	On	255