B# Communication Protocol

[MAC0][MAC1][MAC2][MAC3][MAC4] [MAC5]: 6 bytes Ethernet MAC Address
[TYPECODE][OPCODE][DATA LENGTH]: 3 bytes Command Header

Under B# communication protocol, the host pc acts as a master and the B# board acts as a slave. That means whenever we want to make B# board do any specific actions, it needs to receive CMD from the host PC. For example, as you want to use B# board as battery emulator, you need to send not only simulation data of both voltage and time but also several commands: "Start to emulate"," Measure Current" and "Current data request"

Communication Scenario for Battery Emulator

Host PC	B# board	CMD	Description
Send "ACK REQUEST"		40 00 00	Not required "ACK REQUEST" can be sent any time in communication process.
	Send "ACK"	40 00 01	
Send "MAX_TICK"		80 00 01	Default: 60 *
Send "Prescaler"		81 00 00	Default: 4 (1.665ms) **
Send "Volt DATA"		86 00 xx	
Send "Time DATA"		88 00 xx	
Send "Cur Avg Request"		05 00 00	
	Send "Cur Avg"	05 00 02	
Send "Emulate Volt" & "Measure Cur Avg."		80 30 00	Emulate Voltage: OP 0x20 Measure Avg. Cur: OP 0x01

*. Do not need to send this cmd, just make the sum of all time data equal to the simulation period.
**. 1 = 0.208ms 2 = 0.417ms 3 = 0.835ms 4 = 1.665ms 5 = 3.325ms 6 = 6.65ms 7 = 13.35ms

Communication Scenario for Power Profiler

Host PC	B# board	CMD	Description
Send "ACK REQUEST"		40 00 00	Not required "ACK REQUEST" can be sent any time in communication process.
	Send "ACK"	40 00 01	
Send "MAX_TICK"		80 00 01	Required to set MAX_TICK to 1 or 2
Send "Prescaler"		81 00 00	Default: 4 (1.665ms) **
Send "Measure Volt" & "Measure Curr"		80 c0 00	Measure Volt: 0x80 Measure Curr: 0x40
Send "Curr Request		07 00 00	
	Send Curr DATA	07 00 xx	
Send "Volt Request"		06 00 00	
	Send Volt DATA	06 00 xx	

Communication Scenario for playing back an acquired profile

Host PC	B# board	CMD	Description
Send "ACK REQUEST"		40 00 00	Not required "ACK REQUEST" can be sent any time in communication process.
	Send "ACK"	40 00 01	
Send "MAX_TICK"		80 00 01	MAX_TICK must be set to 0x01
Send "Prescaler"		81 00 00	Default: 4 (1.665ms) **
Send "Volt DATA"		86 00 02	
Send "Time DATA"		88 00 02	
Send "Emulate Voltage"		80 20 00	Emulate Voltage: OP 0x20

Communication Commands

Description	**Com**	**Type**	**1st**	**2nd (opcode)**	**3rd(Length)**
ACK REQUEST	0x00	0x40	**0x40**	**0x00**	**0x00**
SEND TIME DATA	0x80	0x08	**0x88**	**0x00**	**# of bytes**
SEND VOLT DATA	0x80	0x06	**0x86**	**0x00**	**# of bytes**
SEND MAX_TICK	0x80	0x00	**0x80**	**0x00**	**0x01**
SEND PRESCALER	0x80	0x01	**0x81**	**0x00**	**0x01**
SEND CURRENT REQUST	0x00	0x07	**0x07**	**0x00**	**0x00**
SEND VOLTAGE REQUST	0x00	0x06	**0x06**	**0x00**	**0x00**
SEND CUR AVG. REQUST	0x00	0x05	**0x05**	**0x00**	**0x00**
SEND MEASURE VOLTAGE	0x80	0x**	**0x80**	**0x80**	**0x00**
SEND MEASURE CURRENT	0x80	0x**	**0x80**	**0x40**	**0x00**
SEND MEASURE CUR AVG.	0x80	0x**	**0x80**	**0x20**	**0x00**
SEND EMULATE VOLTAGE	0x80	0x**	**0x80**	**0x10**	**0x00**