WatchMon - Wifi UDP protocol

Version

1.0 – 1/12/2017 – Software 1.0.30

Communication Overview

Outbound messages are broadcast to
Supervisor broadcasts to udp port 18542 at IP 255.255255.255

Payload format

- Pos 0 ":" Start Header character colin (0x3A)
- Pos 1..2 UInt16 MessageType
- Pos 3 "," seperator comma
- Pos 4 uint16 SystemID
- Pos 6 uint16 HubID (default 0 - future extension of SystemID)

Wifi Broadcast modes

- Idle – no broadcast communication
- Limited - Only send Discover MsgType every 1.5 Seconds
- Verbose (default) - All messages scheduled in their relevate frequency slot transmitted at ~50mS interval
- Verbose (read only)
- Disabled - module powered down

Outbound messages Types

Frequency A - 150 millisecond

- 0x415A – Individual cell monitor Basic Status (subset for up to 16)
- 0x4232 – Individual cell monitor Full Info (node specific)

Frequency B - 300 milliseconds

- 0X3E32 – Telemetry - Combined Status Rapid Info

Frequency C - 1.5 seconds

- 0X3F33 – Telemetry - Combined Status Fast Info
- 0X4732 – Telemetry - Logic Control Status Info
- 0x4932 – Telemetry - Remote Status Info
- 0x6131 – Telemetry - Communication Status Info
- 0x5732 – System Discovery Info

Frequency D - 22 seconds

- 0X4032 – Telemetry - Combined Status Slow Info
- 0x5432 – Telemetry - Daily Session Info
- 0x7857 – Telemetry - Shunt Metric Info
- 0x5632 – Telemetry - Life Metric Info
- 0X4A35 – Hardware - System setup configuration Info
- 0X4B35 – Hardware - Cell Group setup configuration Info
- 0X4C33 – Hardware - Shunt setup configuration Info
- 0X4D33 – Hardware - Expansion setup configuration Info
- 0X5334 – Hardware - Integration setup configuration Info
- 0X4F33 – Control logic – Critical setup configuration Info
- 0X5033 – Control logic - Charge setup configuration Info
- 0X5158 – Control logic - Discharge setup configuration Info
- 0X5258 – Control logic - Thermal setup configuration Info
- 0X4E58 – Control logic - Remote setup configuration Info

Frequency E - Adhoc request / response

- 0x5831 – Telemetry - Daily Session History
- 0x6831 – Telemetry - Quick Session History
- 0x5431 – Telemetry - Session Metrics

System Discovery Information – payload formatting

Identifier: 0X5732 Recommended to monitor
Frequency: 1.55 seconds
Data Length: 50 bytes
Version 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
System Code	8	Text 8		
Firmware Version	16	Uint16		
Hardware Version	18	Uint16		
Device Time	20	Uint32	Unix Epoch	seconds since 1-1-1970

System Op status	24	Uint8	Timeout = 0,
			Idle = 1, // LED = green slow pulse
			Charging = 2, // LED = blue slow pulse
			Discharging = 3, // LED = green solid
			Full = 4, // LED = blue double blink
			Empty = 5, // LED = green double blink
			Simulator = 6 , // LED = rainbow pulse
			CriticalPending = 7, // LED = red fast pulse
			CriticalOffline = 8, // LED = red slow pulse
			MqttOffline = 9, // LED = white blink
			AuthSetup = 10, // LED = white solid	

System Auth Mode	25	Uint8	0 = Default 1 = Technician 2 = Factory	
Critical BattOkState	26	Bool	0 or 1	
Charge PowerRate State	27	Uint8	Off = 0, Limited = 2, Normal = 4,	
Discharge PowerRate State	28	Uint8		
Heat On State	29	Bool	0 or 1	
Cool On State	30	Bool	0 or 1	
Min Cell Volt	31	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Volt	33	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Avg Cell Volt	35	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Min Cell Temp	37	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Num of active Cellmons	38	Uint8	0 to 254	
CMU Port Rx USN	39	Uint8		
CMU Poller Mode	40	Uint8	Idle = 0, Normal = 1, Start collection = 2, Collection running = 3, Start syncronisation = 4, Sync Running = 5, Start NetworkTest = 6, NetworkTest running = 9, Start BypassTest = 7, BypassTest running = 8, Start Reboot All = 10, Reboot All devices = 11, Start Simulator = 12, Simulator running = 13, Undefined = 255,	

Cont../

Shunt SoC	41	uint8	-5% to +105%	0.5% / bit and 5% offset
Shunt Voltage	42	Uint16		Multiple (100) according to setup
Shunt Current	44	Float	mA	(+ charge , - discharge)
Shunt Status	48	Uint8	Timeout = 0, Discharging = 1, Idle = 2, Charging = 4	
Shunt RX ticks	49	Uint8		

Telemetry - Combined Status Rapid Info – payload formatting

Identifier: 0x3E32 – Recommended to monitor
Frequency: 294 milliseconds
Data Length: 50 bytes
Version 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Min Cell Voltage	8	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	10	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Min Cell Volt Reference	12	Uint8	0 to 250	Node Identifier
Max Cell Volt Reference	13	Uint8	0 to 250	Node Identifier
Min Cell Temperature	14	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Min Cell Temperature	15	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Min Cell Temp Reference	16	Uint8	0 to 250	Node Identifier
Max Cell Temp Reference	17	Uint8	0 to 250	Node Identifier
Min Cell Bypass Current	18	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Max Cell Bypass Current	20	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Min Cell Bypass Ref ID	22	Uint8	0 to 250	Node Identifier
Max Cell Bypass Ref ID	23	Uint8	0 to 250	Node Identifier
Min Bypass Temperature	24	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Min Bypass Temperature	25	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Min Bypass Temp Ref ID	26	Uint8	0 to 250	Node Identifier
Max Bypass Temp Ref ID	27	Uint8	0 to 250	Node Identifier
Average Cell Voltage	28	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Average Cell Temperature	30	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Num# of Cells Above Initial Bypass	31	Uint8	0 to 250	
Num# of Cells Above Final Bypass	32	Uint8	0 to 250	
Num# of Cells in Bypass	33	Uint8	0 to 250	
Num# of Cells Overdue	34	Uint8	0 to 250	
Num# of Cells Active	35	Uint8	0 to 250	
Num# of Cells in System	36	Uint8	0 to 250	
CMU port TX NodeID	37	Uint8		
CMU port RX NodeID	38	Uint8		
CMU port RX USN	39	Uint8	0 to 254	Serial number packet counter
Shunt Voltage	40	Uint16		Multiple (100) according to setup
Shunt Amp	42	Float	mA	(+ charge , - discharge)
Shunt Power	46	Float	VA	(+ charge , - discharge)

Telemetry - Combined Status Fast Info – payload formatting

Identifier: 0X3F33 – Recommended to monitor
Frequency: 1.55 seconds
Version: 3
Data Length: 80 bytes

Field	Offset	Data Type	Format / Range	Resolution / Notes
CMU Poller Mode	8	Uint8	0 = Idle, 1 = Normal, 2 = Start collection, 3= Collection running, 4 = Start synchronisation, 5 = Sync Running, 6 = Start NetworkTest, 9 = NetworkTest running, 7 = Start BypassTest, 8 = BypassTest running, 10 = Start Reboot All, 11 = Reboot All devices, 12 = Start Simulator, 13 = Simulator running,	
CMU Port TX Ack count	9	Uint8	0 to 250	
CMU Port TX Op Status NodeID	10	Uint8		Node Identifier
CMU Port TX Op Status USN	11	Uint8	0 to 254	Serial packet counter
CMU Port TX Op Parameter NodeID	12	uint8		Node Identifier
Group Min Cell Volt	13	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Group Max Cell Volt	15	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Group Min Cell Temp	17	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Group Max Cell Temp	18	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
CMU Port RX Op Status NodeID	19	Uint8	0 to 250	Node Identifier
CMU Port RX Op Status Group Acknowledgement	20	Uint8		
CMU Port RX Op Status USN	21	Uint8	0 to 254	Serial packet counter
CMU Port RX Op Parameter NodeID	22	Uint8	0 to 250	Node Identifier

System Op status	23	Uint8	Timeout = 0,
			Idle = 1, // LED = green slow pulse
			Charging = 2, // LED = blue slow pulse
			Discharging = 3, // LED = green solid
			Full = 4, // LED = blue double blink
			Empty = 5, // LED = green double blink
			Simulator = 6 , // LED = rainbow pulse
			CriticalPending = 7, // LED = red fast pulse
			CriticalOffline = 8, // LED = red slow pulse
			MqttOffline = 9, // LED = white blink
			AuthSetup = 10, // LED = white solid	

System Auth Mode	24	Uint8	0 = Default 1 = Technician 2 = Factory	
System Supply Volt	25	Uint16	0 to 6,500 mV	1mV / bit and nil offset
System Ambient Temp	27	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
System Device Time	28	Uint32	Date Time	1sec/bit since 1.1.1970
Shunt State of Charge	32	Uint8	-5% to +105%	0.5% / bit and 5% offset

Shunt Celsius	33	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Shunt Nom. Capacity to full	34	Float	mAh	
Shunt Nom. Capacity to empty	38	Float	mAh	
Shunt Poller Mode	42	Uint8	0 = Start sync, 1 = Sync running, 2 = Normal, 3 = Idle,	
Shunt Status	43	Uint8	Timeout = 0, Discharging = 1, Idle = 2, Charging = 4	
Shunt Lo State of Charge Re Calibration	44	Bool	0 or 1	
Shunt Hi State of Charge Re Calibration	45	Bool	0 or 1	
Expansion Output Battery On	46	Bool	0 or 1	
Expansion Output Battery Off	47	Bool	0 or 1	
Expansion Output Load On	48	Bool	0 or 1	
Expansion Output Load Off	49	Bool	0 or 1	
Expansion Output Relay 1	50	Bool	0 or 1	
Expansion Output Relay 2	51	Bool	0 or 1	
Expansion Output Relay 3	52	Bool	0 or 1	
Expansion Output Relay 4	53	Bool	0 or 1	
Expansion Output PWM1	54	Uint16		
Expansion Output PWM2	56	Uint16		
Expansion Input Run LED Mode	58	Bool	0 or 1	
Expansion Input Charge Normal Mode	59	Bool	0 or 1	
Expansion Input Battery Contactor	60	Bool	0 or 1	
Expansion Input Load Contactor	61	Bool	0 or 1	
Expansion Input Signal In	62	Uint8		
Expansion Input AIN1	63	Uint16		
Expansion Input AIN2	65	Uint16		
Min Bypass Session	67	Float	mAh	mAh
Max Bypass Session	71	Float	mAh	mAh
Min Bypass Session Reference	75	Uint8	0 to 250	Node Identifier for Min
Max Bypass Session Reference	76	Uint8	0 to 250	Node Identifier for Max
Rebalance Bypass extra	77	Bool	0 or 1	When invoked
Repeat Cell Volt Counter	78	Uint16	0 to 6700	Num of msg with cell voltage unchanged

Telemetry - Combined Status Slow Information – payload formatting

Identifier: 0X4032
Frequency: 22 seconds
Data Length: 66 bytes
Version: 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Sys Start up Time	8	Uint32	Unix Epoch	seconds since 1-1-1970
Sys Process Control	12	Bool	0 or 1	
Sys Is Initial Start up	13	Bool	0 or 1	
Sys Ignore When Cells Overdue	14	Bool	0 or 1	
Sys Ignore When Shunts Overdue	15	Bool	0 or 1	
Monitor Daily Session Stats for system	16	Bool	0 or 1	
Setup Version for System	17	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Cell Group	18	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Shunt	19	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Expansion	20	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Comms Channel	21	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Critical	22	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Charge	23	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Discharge	24	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Thermal	25	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Remote	26	Uint8	0 to 255	Incremental version number when saved to track when updates made
Setup Version for Scheduler	27	Uint8	0 to 255	Incremental version number when saved to track when updates made
Shunt Estimated Duration To Full in mins	28	Uint16		1 minute / bit and nil offset
Shunt Estimated Duration To Empty in mins	30	Uint16		1 minute / bit and nil offset
Shunt Recent Charge mAh Average	32	Float	mAh	
Shunt Recent Discharge mAh Average	36	Float	mAh	
Shunt Recent Nett mAh	40	Float	mAh	
Has Shunt SoC Count Lo	44	Bool	0 or 1	
Has Shunt SoC Count Hi	45	Bool	0 or 1	
Quick Session Recent Time	46	Uint32	Unix Epoch	seconds since 1-1-1970
Quick Session Number of Records	50	Uint16		
Quick Session Max Records	52	Uint16		
Shunt Nett Accumulated Count	54	Int64		
Shunt Nominal Capacity to Empty	62	Float	mAh	

Telemetry - Logic Control Status Information – payload formatting

Identifier: 0X4732
Frequency: 1.55 seconds
Data Length: 79 bytes
Version 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Critical is Battery OK – current State	8	Bool	0 or 1	
Critical Is Battery OK – live calc	9	Bool	0 or 1	
Critical Is Transition	10	Bool	0 or 1	
Critical Has Cells Overdue	11	Bool	0 or 1	
Critical Has Cells in Low Voltage State	12	Bool	0 or 1	
Critical Has Cells in High Voltage State	13	Bool	0 or 1	
Critical Has Cells in Low Temp	14	Bool	0 or 1	
Critical has Cells in high Temp	15	Bool	0 or 1	
Critical Has Supply Voltage Low	16	Bool	0 or 1	
Critical Has Supply Voltage High	17	Bool	0 or 1	
Critical Has Ambient Temp Low	18	Bool	0 or 1	
Critical Has Ambient Temp High	19	Bool	0 or 1	
Critical Has Shunt Voltage Low	20	Bool	0 or 1	
Critical Has Shunt Voltage High	21	Bool	0 or 1	
Critical Has Shunt Low Idle Volt	22	Bool	0 or 1	
Critical Has Shunt Peak Charge	23	Bool	0 or 1	
Critical Has Shunt Peak Discharge	24	Bool	0 or 1	
Charging Is ON State	25	Bool	0 or 1	
Charging is Limited Power	26	Bool	0 or 1	
Charging is in Transition	27	Bool	0 or 1	
Charging Power Rate – current state	28	Uint8	0 = Off, 2 = Limited power, 4 = Normal power,	
Charging Power Rate - live calc	29	Uint8	0 = Off, 2 = Limited power, 4 = Normal power,	
Charging Has Cell Volt High	30	Bool	0 or 1	
Charging Has Cell Volt Pause	31	Bool	0 or 1	
Charging Has Cell Volt Limited Power	32	Bool	0 or 1	
Charging Has Cell Temp Low	33	Bool	0 or 1	
Charging Has Cell Temp High	34	Bool	0 or 1	
Charging Has Ambient Temp Low	35	Bool	0 or 1	
Charging Has Ambient Temp High	36	Bool	0 or 1	
Charging Has Supply Volt High	37	Bool	0 or 1	
Charging Has Supply Volt Pause	38	Bool	0 or 1	
Charging Has Shunt Volt High	39	Bool	0 or 1	
Charging Has Shunt Volt Pause	40	Bool	0 or 1	
Charging Has Shunt Volt Lim Power	41	Bool	0 or 1	
Charging Has Shunt Soc High	42	Bool	0 or 1	
Charging Has Shunt Soc Pause	43	Bool	0 or 1	
Charging Has Cells Above Initial Bypass	44	Bool	0 or 1	
Charging Has Cells Above Final Bypass	45	Bool	0 or 1	
Charging Has Cells In Bypass	46	Bool	0 or 1	
Charging Has Bypass Complete	47	Bool	0 or 1	
Charging Has Bypass Temp Relief	48	Bool	0 or 1	
Discharging Is ON State	49	Bool	0 or 1	
Discharging is Limited Power	50	Bool	0 or 1	
Discharging is in Transition	51	Bool	0 or 1	
Discharging Power Rate – current state	52	Uint8	0 = Off, 2 = Limited power,	

			4 = Normal power,	
Discharging Power Rate – live calc	53	Uint8	0 = Off, 2 = Limited power, 4 = Normal power,	
Discharging Has Cell Volt Low	54	Bool	0 or 1	
Discharging Has Cell Volt Pause	55	Bool	0 or 1	
Discharging Has Cell Volt Limited Power	56	Bool	0 or 1	
Discharging Has Cell Temp Low	57	Bool	0 or 1	
Discharging Has Cell Temp High	58	Bool	0 or 1	
Discharging Has Ambient Temp Low	59	Bool	0 or 1	
Discharging Has Ambient Temp High	60	Bool	0 or 1	
Discharging Has Supply Volt Low	61	Bool	0 or 1	
Discharging Has Supply Volt Pause	62	Bool	0 or 1	
Discharging Has Shunt Volt Low	63	Bool	0 or 1	
Discharging Has Shunt Volt Pause	64	Bool	0 or 1	
Discharging Has Shunt Volt Limited Power	65	Bool	0 or 1	
Discharging Has Shunt Soc Low	66	Bool	0 or 1	
Discharging Has Shunt Soc Pause	67	Bool	0 or 1	
Thermal Heat ON – current state	68	Bool	0 or 1	
Thermal Heat ON – live calc	69	Bool	0 or 1	
Thermal Transition Heat ON	70	Bool	0 or 1	
Thermal Ambient Temp Low	71	Bool	0 or 1	
Thermal Cells In Temp Low	72	Bool	0 or 1	
Thermal Cool ON – current state	73	Bool	0 or 1	
Thermal Cool ON – live calc	74	Bool	0 or 1	
Thermal Transition Cool ON	75	Bool	0 or 1	
Thermal Ambient Temp High	76	Bool	0 or 1	
Thermal Cells In Temp High	77	Bool	0 or 1	
Charging Has Bypass Session Low	78	Bool	0 or 1	

Telemetry - Remote Status Information – payload formatting

Identifier: 0X4932
Frequency: 1.55 seconds
Data Length: 62 bytes
Version: 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Canbus RX ticks	8	Uint8	0 to 254	
Canbus RX unknown ticks	9	Uint8	0 to 254	
Canbus TX ticks	10	Uint8	0 to 254	
Charge Actual Celsius	11	Uint8		User-defined
Charge Target Volt	12	Uint16	0 to 650.00 V	User-defined (i.e. 10mV / bit, 5400 = 54.00V)
Charge Target Amp	14	Uint16	0 to 650.00 A	User-defined (i.e. 10mA / bit, 12000 = 120.0A)
Charge Target VA	16	Uint16	0 to 65,000	User-defined (i.e. 1VA / bit, 5000 = 5.00kVA)
Charge Actual Volt	18	Uint16	0 to 650.00 V	User-defined (i.e. 10mV / bit, 5400 = 54.00V)
Charge Actual Amp	20	Uint16	0 to 650.00 A	User-defined (i.e. 10mA / bit, 12000 = 120.0A)
Charge Actual VA	22	Uint16	0 to 65,000	User-defined (i.e. 1VA / bit, 5000 = 5.00kVA)
Charge Actual Flags 1	24	Uint32		User-defined
Charge Actual Flags 2	28	Uint32		User-defined
Charge Actual Rx Time	32	Uint32	Unix Epoch	seconds since 1-1-1970
reserved	36			
Discharge Actual Celsius	37	Uint8		User-defined
Discharge Target Volt	38	Uint16	0 to 650.00 V	User-defined (i.e. 10mV / bit, 5400 = 54.00V)
Discharge Target Amp	40	Uint16	0 to 650.00 A	User-defined (i.e. 10mA / bit, 12000 = 120.0A)
Discharge Target VA	42	Uint16	0 to 65,000	User-defined (i.e. 1VA / bit, 5000 = 5.00kVA)
Discharge Actual Volt	44	Uint16	0 to 650.00 V	User-defined (i.e. 10mV / bit, 5400 = 54.00V)
Discharge Actual Amp	46	Uint16	0 to 650.00 A	User-defined (i.e. 10mA / bit, 12000 = 120.0A)
Discharge Actual VA	48	Uint16	0 to 65,000	User-defined (i.e. 1VA / bit, 5000 = 5.00kVA)
Discharge Actual Flags 1	50	Uint32		User-defined
Discharge Actual Flags 2	54	Uint32		User-defined
Discharge Actual Rx Time	58	Uint32	Unix Epoch	seconds since 1-1-1970

Telemetry - Status Comms Info – payload formatting

Identifier: 0X6131
Frequency: 1.55 seconds
Data Length: 33 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Device Time	8	Uint32	Unix Epoch	seconds since 1-1-1970

System Op status	12	Uint8	Timeout = 0,
			Idle = 1, // LED = green slow pulse
			Charging = 2, // LED = blue slow pulse
			Discharging = 3, // LED = green solid
			Full = 4, // LED = blue double blink
			Empty = 5, // LED = green double blink
			Simulator = 6 , // LED = rainbow pulse
			Critical Pending = 7, // LED = red fast pulse
			Critical Offline = 8, // LED = red slow pulse
			Mqtt Offline = 9, // LED = white blink
			Auth Setup = 10, // LED = white solid	

System Auth Mode	13	Uint8	0 = Default 1 = Technician 2 = Factory	
Auth Token	14	Uint16		
Auth Rejection Attempts	16	Uint8	0 to 254	
Wifi State	17	Uint8	Broadcast Start = 0, Broadcast Prep = 1, Broadcast TxSetup = 2, Broadcast Running = 3, UsbCmd Start = 4, UsbCmd Running = 5, UsbCmd PassThru = 6, UsbProg Start = 7, UsbProg Running = 8, UsbProg PassThru = 9, Offline Start = 10, Offline Running = 11, Offline Stop = 12, Limited Start = 13, Limited Prep = 14, Limited Running = 15, JoinAp Start = 16, JoinAp Running = 17,	
Wifi Tx Cmd Ticks	18	Uint8	0 to 250	
Wifi Rx Cmd Ticks	19	Uint8	0 to 250	
Wifi Rx Unknown Ticks	20	Uint8	0 to 250	

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Canbus Status	21	Uint8		Reserved
Canbus Rx Cmd Ticks	22	Uint8	0 to 250	
Canbus Rx Unknown Ticks	23	Uint8	0 to 250	
Canbus Tx Cmd Ticks	24	Uint8	0 to 250	
Shunt Poller Mode	25	Uint8	0 = Start sync, 1 = Sync running, 2 = Normal, 3 = Idle,	
Shunt Status	26	Uint8	Timeout = 0, Discharging = 1, Idle = 2, Charging = 4	
Shunt Tx Ticks	27	Uint8	0 to 250	
Shunt Rx Ticks	28	Uint8	0 to 250	
CMU Poller Mode	29		0 = Idle, 1 = Normal, 2 = Start collection, 3= Collection running, 4 = Start synchronisation, 5 = Sync Running, 6 = Start NetworkTest, 9 = NetworkTest running, 7 = Start BypassTest, 8 = BypassTest running, 10 = Start Reboot All, 11 = Reboot All devices, 12 = Start Simulator, 13 = Simulator running,	
Cellmon CMU Status	30			Reserved
Cellmon CMU Tx USN	31	Uint8	0 to 250	Will be switched to ticks
Cellmon CMU Rx USN	32	Uint8	0 to 250	Will be switched to ticks

Hardware - System Setup configuration info – payload formatting

Identifier: 0X4A35
Frequency: 22 seconds
Data Length: 76 bytes
Version: 5

Field	Offset	Data Type	Format / Range	Resolution / Notes
Setup Version	8	Uint8	0 to 255	Incremental version number when saved to track when updates made
System Code	10	Text 8		
System Name	18	Text 20		
Asset Code	38	Text 20		
Allow Tech Authority	58	Bool	0 or 1	
Allow QuickSession	59	Bool	0 or 1	
Quick Session Intervall	60	Uint32	milliSeconds	30s,60s,2min or 5min
Preset ID	64	Uint16		#1
Firmware Version	66	Uint16		#1
Hardware Version	68	Uint16		#1
Serial Number	70	Uint32		#1
Show Scheduler	74	Bool	0 or 1	
Show StripCycle	75	Bool	0 or 1	

#1 has been included for information only

Hardware - Cell Group Setup configuration info – payload formatting

Identifier: 0X4B35
Frequency: 22 seconds
Data Length: 53 bytes
Version: 5

Field	Offset	Data Type	Format / Range	Resolution / Notes
Setup Version	8	Uint8	0 to 255	Incremental version number when saved to track when updates made
Battery Type ID	9	Uint8	0 = Custom, 1 = Li-FePO4 Typical 4 = Li-FePO4 Long Life, 2 = Li-Ion Performance 3 = Li-Ion Long Life	
First Node ID	10	Uint8		Node Identifier
Last Node ID	11	Uint8		Node Identifier
Nominal Cell Voltage	12	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Low Cell Voltage	14	Uint16	0 to 6,500 mV	1mV / bit and nil offset
High Cell Voltage	16	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Bypass Voltage Level	18	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Bypass Amp Limit	20	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Bypass Temp Limit	22	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Low Cell Temp	23	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
High Cell Temp	24	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Diff Nom Cells in Series	25	Bool	0 or 1	
Nom Cells in Series	26	Uint8		
Allow Entire Range	27	Bool	0 or 1	
First Node ID of Entire Range	28	Uint8		Node Identifier
Last Node ID of Entire Range	29	Uint8		Node Identifier
Bypass Extra Mode	30	Uint8	0 = None, 1 = Idle Shunt 2 =Same cell volt, 3 = Auto Level	
Bypass Latch Interval	31	Uint16		1mS/bit
CellMon Type ID	33	Uint8	0 = Custom, 1 = GenMon2W, 2 = GenMon8W, 3 = LongMon, 4 = BlockMonM8, 5 = BlockMonM14 6 = EndMon, 7 = ManyMon,	
Bypass Impedance	34	Float		
Bypass CellVolt low cutout	38	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Bypass Shunt Amp Limit – Charge	40	Uint16	0 to 6,500 mA	1mA / bit and nil offset
Bypass Shunt Amp Limit – Discharge	42	Uint16	0 to 6,500 mA	1mA / bit and nil offset
Bypass Shunt SoC% Min Limit	44	Uint8	-5% to +105%	0.5% / bit and 5% offset
Bypass Cell Volt Banding	45	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Bypass Cell Volt Difference	47	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Bypass Stable Interval	49	Uint16		
Bypass Extra Amp Limit	51	Uint16	0 to 2,500 mA	1mA / bit and nil offset

Hardware - Shunt setup configuration info – payload formatting

Identifier: 0X4C33
Frequency: 22 seconds
Data Length: 60 bytes
Version: 3

Field	Offset	Data Type	Format / Range	Resolution / Notes
Shunt Type ID	8	Uint8	0 = None, 1 = SFP102MOD 100uOhm 375A 150V 2 = SFP101EVB 72uOhm 500A 150V 3 = SFP101EVB 25uOhm 1500A 150V 4 = SFP102MOD (4k) 375A 750V 5 = SFP102MOD (3k) 375A 600V 6 = SFP102MOD 100uOhm 375A 150V Negative 7 = SFP102MOD 50uOhm 750A 150V 16 = ShuntMon2 50uOhm 500A 650V 254 = Simulator 255 = Custom	
Voltage Scale	9	Uint16		
Amp Scale	11	Uint16		
Charge Idle	13	Uint16		
Discharge Idle	15	Uint16		
SoC Count Low	17	uint8	-5% to +105%	0.5% / bit and 5% offset
SoC Count High	18	uint8	-5% to +105%	0.5% / bit and 5% offset
SoC Lo Recalibration	19	uint8	-5% to +105%	0.5% / bit and 5% offset
SoC Hi Recalibration	20	uint8	-5% to +105%	0.5% / bit and 5% offset
Monitor SoC Low Recalibration	21	Bool	0 or 1	
Monitor SoC High Recalibration	22	Bool	0 or 1	
Monitor in Bypass Recalibration	23	Bool	0 or 1	
Nominal Capacity in mAh	24	Float		
Granularity in Volts	28	Float		
Granularity in Amps	32	Float		
Granularity in mAh	36	Float		
Granularity in Celcius	40	Float		
Reverse Flow	44	Bool	0 or 1	
Setup Version	45	Uint8	0 to 255	Incremental version number when saved to track when updates made
Granularity in VA	46	Float		Power
Granularity in VA hour	50	Float		Energy consumed
Max Voltage	54	Uint16		Device limit for uint16
Max Amp Charge	56	Uint16		Device limit for uint16
Max Amp Dischg	58	Uint16		Device limit for uint16

Hardware - Expansion setup configuration info – payload formatting

Identifier: 0X4D33
Frequency: 22 seconds
Data Length: 32 bytes
Version 3

Field	Offset	Data Type	Format / Range	Resolution / Notes
Setup Version	8	Uint8	0 to 255	Incremental version number when saved to track when updates made
Extension Template	9	Uint8	0 = None 1 = 12v Expansion Board R1 2 = 48v Expansion Board R1 3 = Watchmon CMC 2.0 255 = Custom	
Neo Pixel Ext Status Mode	10	Uint8	0 = None = 0, 1 = Repeat = 1, 2 = 8 segment SoC% 3 = 8 Segment Solid Soc%	

Relay 1 function	11	Uint8	0 = None = 0,
			1 = Manual On
			2 = Critical Batt Ok
			3 = Warning Alert On // obsolete
			4 = Charging On
			5 = Discharging On
			6 = Heating Required
			7 = Cooling Required
			8 = Run / Idle input
			9 = Charge / Normal input
			10 = Bypass Complete
			11 = Charging Limited
			12 = Discharge Limited
			13 = Critical Recovery
			14 = Critical Pulse On
			15 = Critical Pulse Off
			16 = Critical Fault
			17 = Precharge timer
			18 = Fluid pump required
			19 = Strip cycle discharge
			20 = Strip cycle isolate
			21 = warning HVA high volt alert charge
			22 = warning LVA low volt alert discharge	

Relay 2 function	12	Uint8		
Relay 3 function	13	Uint8		
Relay 4 function	14	Uint8		
Output 5 function	15	Uint8		
Output 6 function	16	Uint8		
Output 7 function	17	Uint8		
Output 8 function	18	Uint8		
Output 9 function	19	Uint8	Reserved PWM	
Output 10 function	20	Uint8	Reserved PWM	
Input 1 function	21	Uint8	0 = None 1 = Run / Idle discharge/critical mode 2 = Critical contact sensor – On 3 = Critical contact sensor - Fault	
Input 2 function	22	Uint8		
Input 3 function	23	Uint8		
Input 4 function	24	Uint8		
Input 5 function	25	Uint8		
Input AIN 1 function	26	Uint8		
Input AIN 2 function	27	Uint8		
Custom Feature 1	28	Uint16		
Custom Feature 2	30	Uint16		

Hardware - Integration Setup configuration info – payload formatting

Identifier: 0X5334
Frequency: 22 seconds
Data Length: 26 bytes
Version: 4

Field	Offset	Data Type	Format / Range	Resolution / Notes
Setup Version	8	Uint8	0 to 255	Incremental version number when saved to track when updates made
USB TX Broadcast	9	Bool	0 or 1	
Wifi UDP TX Broadcast	10	Bool	0 or 1	
Wifi Broadcast Mode	11	Uint8	0 = None, 1 = Verbose, 2 = Limited, 3 = Disabled 4 = Readonly Verbose	
Canbus TX Broadcast	11	Bool	0 or 1	
Canbus Mode	12	Uint8	0 = None, 1 = Native, 2 = Elcon / TC-charger 3 = En-Power 500k charger 4 = Solax power SK 5 = Sma Sunny Island v3.1 6 = Brusa NLG5 charger 7 = En-Power 250k charger 8 = Solax power SK limited 9 = Brusa NLG6 charger 10 = Project Lychee 11 = Eltek FlatPack2 HE2000/48 14 = Project Thomas 15 = Victron colour control GX 42 = Project42	
Canbus Remote Address	13	Uint32		
Canbus Base Address	13	Uint32		
Canbus Group Address	13	Uint32		

Control Logic - Critical Setup configuration info – payload formatting

Identifier: 0X4F33
Frequency: 22 seconds
Data Length: 75 bytes
Version: 3

Field	Offset	Data Type	Format / Range	Resolution / Notes
Control Mode	8	Uint8	0 = Auto 1 = Manual ON 2 = Manual OFF	
Auto Recovery	9	Bool	0 or 1	
Ignore Overdue Cells	10	Bool	0 or 1	
Monitor Low Cell Voltage	11	Bool	0 or 1	
Monitor High Cell Voltage	12	Bool	0 or 1	
Low Cell Voltage	13	Uint16	0 to 6,500 mV	1mV / bit and nil offset
High Cell Voltage	15	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Monitor Low Cell Temp	17	Bool	0 or 1	
Monitor High Cell Temp	18	Bool	0 or 1	
Low Cell Temp	19	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
High Cell Temp	20	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Low Supply Voltage	21	Bool	0 or 1	
Monitor High Supply Voltage	22	Bool	0 or 1	
Low Supply Voltage	23	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
High Supply Voltage	25	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor Low Ambient Temp	27	Bool	0 or 1	
Monitor High Ambient Temp	28	Bool	0 or 1	
Low Ambient Temp	29	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
High Ambient Temp	30	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Low Shunt Voltage	31	Bool	0 or 1	
Monitor High Shunt Voltage	32	Bool	0 or 1	
Monitor Low Idle Shunt Voltage	33	Bool	0 or 1	
Low Shunt Voltage	34	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
High Shunt Voltage	36	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Low Idle Shunt Voltage	38	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor Shunt Voltage Peak Charge	40	Bool	0 or 1	
Shunt Peak Charge	41	Uint16		
Shunt C-rate Charge	43	Uint16		
Monitor Shunt Peak Discharge	45	Bool	0 or 1	
Shunt Peak Discharge	46	Uint16		
Shunt C-rate Discharge	48	Uint16		
Stop Timer Interval	50	Uint32		1mS / bit and nil offset
Start Timer Interval	54	Uint32		1mS / bit and nil offset
Time Out Manual Override	58	Uint32		1mS / bit and nil offset
Setup Version	62	Uint8	0 to 255	Incremental version number when saved to track when updates made

Control Logic – Charging setup configuration info – payload formatting

Identifier: 0X5033
Frequency: 22 seconds
Data Length: 60 bytes
Version: 3

Field	Offset	Data Type	Format / Range	Resolution / Notes
Control Mode	8	Uint8	0 = Auto 1 = Manual ON 2 = Manual OFF 3 = Manual Limited Power	
Allow Limited Power Stage	9	Bool	0 or 1	
Allow Limited Power Bypass	10	Bool	0 or 1	
Allow Limited Power Complete	11	Bool	0 or 1	
Initial Bypass Current	12	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Final Bypass Current	14	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Monitor Cell Low Temp	16	Bool	0 or 1	
Monitor Cell High Temp	17	Bool	0 or 1	
Cell Low Temp	18	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Cell High Temp	19	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Ambient Low Temp	20	Bool	0 or 1	
Monitor Ambient High Temp	21	Bool	0 or 1	
Ambient Low Temp	22	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Ambient High Temp	23	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Supply High	24	Bool	0 or 1	
Supply Voltage High	25	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Supply Voltage Resume	27	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor High Cell Voltage	29	Bool	0 or 1	
Cell Voltage High	30	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Cell Voltage Resume	32	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Cell Voltage Limited Power	34	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Monitor Shunt Voltage High	36	Bool	0 or 1	
Shunt Voltage High	37	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Shunt Voltage Resume	39	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Shunt Voltage Limited Power	41	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor Shunt SoC High	43	Bool	0 or 1	
Shunt SoC High	44	Uint16	-5% to +105%	0.5% / bit and 5% offset
Shunt SoC Resume	45	Uint16	-5% to +105%	0.5% / bit and 5% offset
Stop Timer Interval	46	Uint32		1mS / bit and nil offset
Start Timer Interval	50	Uint32		1mS / bit and nil offset
Setup Version	54	Uint8	0 to 255	Incremental version number when saved to track when updates made
Bypass Session Low	55	float		mAh
Allow Bypass Session	59	Bool	0 or 1	

Control Logic - Discharge Setup configuration info – payload formatting

Identifier: 0X5158
Frequency: 22 seconds
Data Length: 49 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Control Mode	8	Uint8	0 = Auto 1 = Manual ON 2 = Manual OFF 3 = Manual Limited Power	
Allow Limited Power Stage	9	Bool	0 or 1	
Monitor Cell Temp Low	10	Bool	0 or 1	
Monitor Cell Temp High	11	Bool	0 or 1	
Cell Temp Low	12	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Cell Temp High	13	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Ambient Low	14	Bool	0 or 1	
Monitor Ambient High	15	Bool	0 or 1	
Ambient Temp Low	16	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Ambient Temp High	17	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Monitor Supply Low	18	Bool	0 or 1	
Supply Voltage Low	19	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Supply Voltage Resume	21	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor Cell Voltage Lo	23	Bool	0 or 1	
Cell Voltage Low	24	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Cell Voltage Resume	26	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Cell Voltage Limited Power	28	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Monitor Shunt Voltage Low	30	Bool	0 or 1	
Shunt Voltage Low	31	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Shunt Voltage Resume	33	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Shunt Voltage Limited Power	35	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Monitor Shunt SoC Low	37	Bool	0 or 1	
Shunt SoC Low	38	Uint8	-5% to +105%	0.5% / bit and 5% offset
Shunt SoC Resume	39	Uint8	-5% to +105%	0.5% / bit and 5% offset
Stop Timer Interval	40	Uint32		1mS / bit and nil offset
Start Timer Interval	44	Uint32		1mS / bit and nil offset
Setup Version	48	Uint8	0 to 255	Incremental version number when saved to track when updates made

Control Logic - Thermal Setup configuration info – payload formatting

Identifier: 0X5258
Frequency: 22 seconds
Data Length: 36 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Control Mode Heat	8	Uint8	0 = Auto 1 = Manual ON 2 = Manual OFF	
Monitor Low Cell Temp	9	Bool	0 or 1	
Monitor Low Ambient Temp	10	Bool	0 or 1	
Low Cell Temp	11	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Low Ambient Temp	12	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Stop Timer Interval Heat	13	Uint32		1mS / bit and nil offset
Start Timer Interval Heat	17	Uint32		1mS / bit and nil offset
Control Mode Cool	21	Uint8	0 = Auto 1 = Manual ON 2 = Manual OFF	
Monitor High Cell Temp	22	Bool	0 or 1	
Monitor High Ambient Temp	23	Bool	0 or 1	
Monitor In Cell Bypass	24	Bool	0 or 1	
High Cell Temp	25	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
High Ambient Temp	26	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Stop Timer Interval Cool	27	Uint32		1mS / bit and nil offset
Start Timer Interval Cool	31	Uint32		1mS / bit and nil offset
Setup Version	35	Uint8	0 to 255	Incremental version number when saved to track when updates made

Control Logic - Remote Setup configuration info – payload formatting

Identifier: 0X4E58
Frequency: 22 seconds
Data Length: 45 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Charge Normal Volt	8	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Charge Normal Amp	10	Uint16	0 to 650.00 A	Default multiple 100, defined with configuration (i.e. 0.01A / bit, 12000 = 120.0A)
Charge Normal VA	12	Uint16		
Charge Limited Power Voltage	14	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Charge Limited Power Amp	16	Uint16	0 to 650.00 A	Default multiple 100, defined with configuration (i.e. 0.01A / bit, 12000 = 120.0A)
Charge Limited Power VA	18	Uint16		
Charge Scale16 Voltage	20	Uint16		Default multiple 100
Charge Scale16 Amp	22	Uint16		Default multiple 100
Charge Scale16 VA	24	Uint16		Default multiple 1
Discharge Normal Volt	26	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Discharge Normal Amp	28	Uint16	0 to 650.00 A	Default multiple 100, defined with configuration (i.e. 0.01A / bit, 12000 = 120.0A)
Discharge Normal VA	30	Uint16		
Discharge Limited Power Voltage	32	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Discharge Limited Power Amp	34	Uint16	0 to 650.00 A	Default multiple 100, defined with configuration (i.e. 0.01A / bit, 12000 = 120.0A)
Discharge Limited Power VA	36	Uint16		
Discharge Scale16 Voltage	38	Uint16		Default multiple 100
Discharge Scale16 Amp	40	Uint16		Default multiple 100
Discharge Scale16 VA	42	Uint16		Default multiple 1
Setup Version	44	Uint8	0 to 255	Incremental version number when saved to track when updates made

Telemetry – Daily session info – payload formatting

Identifier: 0X5432
Frequency: 22 seconds
Data Length: 69 bytes
Version: 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Min Cell Voltage	8	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	10	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Min Supply Voltage	12	Uint16	0 to 65.00 V	10mV / bit and nil offset
Max Supply Voltage	14	Uint16	0 to 65.00 V	10mV / bit and nil offset
Min Reported Temperature	16	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset #1
Max Reported Temperature	17	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset #1
Min Shunt Volt	18	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Max Shunt Volt	20	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Min Shunt SoC	22	uint8	-5% to +105%	0.5% / bit and 5% offset
Max Shunt SoC	23	uint8	-5% to +105%	0.5% / bit and 5% offset
Temperature Band A > 60ºC	24	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band B > 55ºC	25	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band C > 41ºC	26	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band D > 33ºC	27	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band E > 25ºC	28	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band F > 15ºC	29	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band G > 0ºC	30	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band H >-40ºC	31	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band A > 87.5%	32	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band B > 75.0%	33	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band C > 62.5%	34	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band D > 50.0%	35	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band E > 37.5%	36	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band F > 25.0%	37	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band G > 12.5%	38	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band H > 0.0%	39	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Shunt Peak Charge	40	Uint16	0.01A / bit	Default multiple 100, defined with configuration
Shunt Peak Discharge	42	Uint16	0.01A / bit	Default multiple 100, defined with configuration
Critical Events	44	Uint8	0 to 255	Number of events within session
Start Time	45	Uint32	Unix Epoch	seconds since 1-1-1970
Finish Time	49	Uint32	Unix Epoch	seconds since 1-1-1970
Cumulative Shunt Amp Hour Charge	53	Float	Reported in mAh	Total counted in 1 min intervals
Cumulative Shunt Amp Hour Discharge	57	Float	Reported in mAh	Total counted in 1 min intervals
Cumulative Shunt Watt Hour Charge	61	Float	Reported in VA hr	
Cumulative Shunt Watt Hour Discharge	65	Float	Reported in VA hr	

Telemetry – Daily session History reply – payload formatting

Identifier: 0X5831
Frequency: adhoc
Data Length: 60 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Record Index	8	Uint16		
Record Time	10	Uint32	Unix Epoch	seconds since 1-1-1970
Critical Events	14	Uint8	0 to 255	Number of events within session
	15			Reserved
Min Reported Temperature	16	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset #1
Max Reported Temperature	17	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset #1
Min Shunt SoC	18	uint8	-5% to +105%	0.5% / bit and 5% offset
Max Shunt SoC	19	uint8	-5% to +105%	0.5% / bit and 5% offset
Min Cell Voltage	20	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	22	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Min Supply Voltage	24	Uint16	0 to 65.00 V	10mV / bit and nil offset
Max Supply Voltage	26	Uint16	0 to 65.00 V	10mV / bit and nil offset
Min Shunt Volt	28	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Max Shunt Volt	30	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Temperature Band A > 60ºC	32	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band B > 55ºC	33	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band C > 41ºC	34	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band D > 33ºC	35	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band E > 25ºC	36	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band F > 15ºC	37	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band G > 0ºC	38	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Temperature Band H >-40ºC	39	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band A > 87.5%	40	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band B > 75.0%	41	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band C > 62.5%	42	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band D > 50.0%	43	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band E > 37.5%	44	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band F > 25.0%	45	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band G > 12.5%	46	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
SOC% Band H > 0.0%	47	Uint8	0 to 240	6min/bit elapsed (240 = 24.0h)
Shunt Peak Charge	48	Uint16	0.01A / bit	Default multiple 100, defined with configuration
Shunt Peak Discharge	50	Uint16	0.01A / bit	Default multiple 100, defined with configuration
Cumulative Shunt Amp Hour Charge	52	Float	Reported in mAh	Total counted in 1 min intervals
Cumulative Shunt Amp Hour Discharge	56	Float	Reported in mAh	Total counted in 1 min intervals

Telemetry – Quick session History reply – payload formatting

Identifier: 0X6831
Frequency: adhoc
Data Length: 32 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Record Index	8	Uint16		
Record Time	10	Uint32	Unix Epoch	seconds since 1-1-1970

System Op status	14	Uint8	Timeout = 0,
			Idle = 1, // LED = green slow pulse
			Charging = 2, // LED = blue slow pulse
			Discharging = 3, // LED = green solid
			Full = 4, // LED = blue double blink
			Empty = 5, // LED = green double blink
			Simulator = 6 , // LED = rainbow pulse
			Critical Pending = 7, // LED = red fast pulse
			Critical Offline = 8, // LED = red slow pulse
			Mqtt Offline = 9, // LED = white blink
			Auth Setup = 10, // LED = white solid	

Control Flags	15	Byte	Bit 0 = Critical Relay Bit 1 = Charging High Power Bit 2 = Charging Limited Power Bit 3 = Discharge High Power Bit 4 = Discharge Limited Power Bit 5 = Cooling required Bit 6 = Heating required	
Min Cell Voltage	16	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	18	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Avg Cell Voltage	20	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Avg Temperature	22	uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset #1
Shunt SoC% HiRes	23	Int16	-5.00% to +105.00%	0.01% / bit
Shunt Volt	25	Uint16	0 to 65.00 V	Default multiple 100, defined with configuration
Shunt Current (A)	27	float	1mA / bit	
Number of cells in Bypass	31	Uint8	0 to 255	

Telemetry – Session metrics info – payload formatting

Identifier: 0X5431
Frequency: adh0c
Data Length: 25 bytes
Version: 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
Recent Time Quick Session	8	Uint32	Unix Epoch	seconds since 1-1-1970
Quick session number of records	12	Uint16		
Quick session record capacity	14	Uint16		
Quick Session Interval	16	Uint32		1bit/mS
Allow Quick Session	20	Bool	0 or 1	
Daily session number of records	21	Uint16		
Daily session record capacity	23	Uint16		

Telemetry – Shunt metrics info – payload formatting

Identifier: 0X7857
Frequency: 22 seconds
Data Length: 76 bytes

Field	Offset	Data Type	Format / Range	Resolution / Notes
Shunt SoC Cycles	8	Uint16		
Last Time Accumulation Saved	10	Uint32	Unix Epoch	seconds since 1-1-1970
Last Time SoC Lo Recal	14	Uint32	Unix Epoch	seconds since 1-1-1970
Last Time SoC Hi Recal	18	Uint32	Unix Epoch	seconds since 1-1-1970
Last Time SoC Lo Count	22	Uint32	Unix Epoch	seconds since 1-1-1970
Last Time SoC Hi Count	26	Uint32	Unix Epoch	seconds since 1-1-1970
Has Shunt SoC Lo Count	30	Bool	0 or 1	
Has Shunt SoC Hi Count	31	Bool	0 or 1	
Estimated Duration to Full in minutes	32	Uint16		
Estimated Duration to Empty in minutes	34	Uint16		
Recent Charge in Avg mAh	36	Float		
Recent Discharge in Avg mAh	40	Float		
Recent Nett mAh	44	Float		
Serial Number	48	Uint32		
Manu Code	52	Uint32		
Part Number	56	Uint16		
Version Code	58	Uint16		
PNS1	60	Text 8		
PNS2	68	Text 8		

Telemetry – Lifetime metrics info – payload formatting

Identifier: 0X5632
Frequency: 22 seconds
Data Length: 115 bytes
Version 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
First Sync Time	8	Uint32	Unix Epoch	seconds since 1-1-1970
Count Startup	12	Uint32		1 event ON / bit
Count Critical Battery OK	16	Uint32		1 event ON / bit
Count Charge On	20	Uint32		1 event ON / bit
Count Charge Limited Power	24	Uint32		1 event ON / bit
Count Discharge On	28	Uint32		1 event ON / bit
Count Discharge Limited Power	32	Uint32		1 event ON / bit
Count Heat On	36	Uint32		1 event ON / bit
Count Cool On	40	Uint32		1 event ON / bit
Count Daily Session	44	Uint16		1 event ON / bit
Most Recent Time Critical On	46	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Critical Off	50	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Charge On	54	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Charge Off	58	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Charge Limited Power	62	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Discharge On	66	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Discharge Off	70	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Discharge Limited Power	74	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Heat On	78	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Heat Off	82	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Cool On	86	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Cool Off	90	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Bypass Initialised	94	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Bypass Completed	98	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Bypass Tested	102	Uint32	Unix Epoch	seconds since 1-1-1970
Recent Bypass Outcomes	106	Uint8	0 = Not Tested, 1 = Preparing, 2 = Testing, 3 = Passed Ok, 4 = Failed,	
Most Recent Time wizard setup	107	Uint32	Unix Epoch	seconds since 1-1-1970
Most Recent Time Rebalancing Extra	111	Uint32	Unix Epoch	seconds since 1-1-1970

Telemetry - Cellmon node status info – payload formatting

Identifier: 0X415A
Frequency: 22 seconds
Data Length: variable
Version 1

Field	Offset	Data Type	Format / Range	Resolution / Notes
CMU Port – RX Node ID	8	Uint8		
Records	9	Uint8		
First Node ID	10	Uint8		Node Identifier
Last Node ID	11	Uint8		Node Identifier
Node ID	idx+0			
USN	Idx+1			
Min Cell Voltage	Idx+2	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	Idx+4	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Temp	Idx+6	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Bypass Temp	Idx+7	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Bypass Amp	Idx+8	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Node Status	Idx+10	Uint8	None = 0, HighVolt = 1, HighTemp = 2, Ok = 3, Timeout = 4, LowVolt = 5, Disabled = 6, InBypass = 7, InitialBypass = 8, FinalBypass = 9, MissingSetup = 10, NoConfig = 11, CellOutLimits = 12, Undefined = 255,	

This contains and array of up to 16 cell modules

Telemetry - Cellmon node full info – payload formatting

Identifier: 0X4232
Data Length: 52 bytes
Version 2

Field	Offset	Data Type	Format / Range	Resolution / Notes
Node ID	8	Uint8		Node Identifier
USN	9	Uint8		
Min Cell Voltage	10	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Voltage	12	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Max Cell Temp	14	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Bypass Temp	15	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Bypass Amp	16	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Error Data Counter	18	Uint8		
Reset Counter	19	Uint8		
Operating Status	20	Uint8	None = 0, HighVolt = 1, HighTemp = 2, Ok = 3, Timeout = 4, LowVolt = 5, Disabled = 6, InBypass = 7, InitialBypass = 8, FinalBypass = 9, MissingSetup = 10, NoConfig = 11, CellOutLimits = 12, Undefined = 255,	
Is Overdue	21	Bool	0 or 1	
Param - Low Cell Voltage	22	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Param - High Cell Voltage	24	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Param - Bypass Voltage Level	26	Uint16	0 to 6,500 mV	1mV / bit and nil offset
Param - Bypass Amp	28	Uint16	0 to 2,500 mA	1mA / bit and nil offset
Param - Bypass Temp Limit	30	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Param – High Cell Temp	31	Uint8	-40ºC to 125ºC	1ºC/bit and 40ºC offset
Param – Raw Volt Cal Offset	32	Uint8		
Device – FW version	33	Uint16		
Device – HW version	35	Uint16		
Device – Boot version	37	Uint16		
Device – Serial Num	39	Uint32		
Bypass Initial Date	43	Uint32	Unix Epoch	seconds since 1-1-1970
Bypass Session mAh	47	Float		Session milli Amp Hour
Repeat CellV	51	Uint8	0 to 250	Counter when same

Legacy Outbound message type register

List of legacy message types available in the previous software versions

Msg Type	Description	SW Vers Introduced	SW Vers Depreciated
0x4A59	Hardware – System setup v1		
0x4A58	Hardware – System setup v2		1.0.21
0x4A33	Hardware – System setup v3		1.0.28
0x4A34	Hardware – System setup v4		1.0.29
0x4B59	Hardware – Cellmon setup v1		
0x4B58	Hardware – Cellmon setup v2		1.0.23
0x4B33	Hardware – Cellmon setup v3		1.0.24
0x4B34	Hardware – Cellmon setup v4		1.0.29
0x4C59	Hardware – Shunt setup v1		
0x4C58	Hardware – Shunt setup v2		1.0.29
0x4D59	Hardware – Expansion setup v1		
0x4D58	Hardware – Expansion setup v2		1.0.26
0x5359	Hardware - Integration setup v1		
0x5358	Hardware - Integration setup v2		1.0.21
0x5333	Hardware - Integration setup v3		1.0.26
0x4F59	Control – Critical setup v1		
0x4F58	Control – Critical setup v2		
0x4F33	Control – Critical setup v3		1.0.27
0x5059	Control – Charging setup v1		
0x5058	Control – Charging setup v2		1.0.21
0x5159	Control – Discharging setup v1		
0x5259	Control – Thermal setup v1		
0x4E59	Control – Remote setup v1		
0x495A	Control – Remote status v1		1.0.21
0x5775	Telemetry – System Discovery v1		1.0.21
0x435A	Telemetry – Combined Rapid statistics v1		
0x3E5A	Telemetry – Combined Rapid status v1		1.0.29
0x3F5A	Telemetry – Combined Fast status v1		1.0.21
0x3F32	Telemetry – Combined Fast status v2		1.0.23
0x405A	Telemetry – Combined Slow v1		1.0.28
0x475A	Telemetry – Control Logic status v1		
0x485A	Telemetry – System Extension status v1		
0x5657	Telemetry – Lifetime metrics v1		1.0.23
0x425A	Telemetry – Cellmon node full details v1		1.0.23