

TED5000 802.15.4 Radio Packet Structure

Overview

The TED5000 radio makes use of the IEEE 802.15.4 standard for sending out data to the display units. There are 3 different packet types that the gateway uses when sending information to the display unit. If you plan on integrating with the TED5000 via wireless, it is suggest you upgrade the Daughterboard Firmware to R93 or higher as it is optimized for 3rd party integration. To obtain the latest daughterboard firmware release, please create a support ticket via the TED website (<http://www.theenergydetective.com/support>)

The packet types are:

- “Second Packet” – sent once a second
- “Minute Packet” – sent once a minute
- “Setup Packet” – sent once a minute

The start location of the data below indicates the start position in the 802.15.4 payload section. Its physical start location may be different depending on the radio hardware being used.

SECOND DATA PACKET

All data sent little endian (ie B1 = low byte B2 = high byte)

Data typically sent as integer (1.23 is sent as 123)

DESCRIPTION	UNITS	Notes	Starting slot	Size	Data Type
Packet Id	0-255		0	1	byte
Display ID		hex serial	1	3	byte
Second	0-59		4	1	byte
Minute	0-59		5	1	byte
Hour	0-23		6	1	byte
Month	1-12		7	1	byte
Day	1-31		8	1	byte
Year	00-99		9	1	byte
MTU 1 Voltage	V	divide by 10	10	4	unsigned int
MTU 2 Voltage	V	divide by 10	14	4	unsigned int
MTU 1 Power (now)	kW	divide by 1000	18	4	signed int
MTU 2 Power (now)		divide by 1000	18	4	signed int
MTU 1 Cost Per Hour (now)	\$/Hr	divide by 100	22	4	signed int
MTU 12 Cost Per Hour (now)	\$/Hr	divide by 100	22	4	signed int
Net Voltage	V	divide by 10	26	4	unsigned int
Net Power (Now)	kW	divide by 1000	30	4	signed int
Net Cost (Now)	\$/Hr	divide by 100	34	4	signed int
plcPacketCount			38	4	unsigned int
skippedPlcPackets			42	4	unsigned int
lastPlcPacketId			46	1	unsigned int
MTU 3 Power (now)	kW	divide by 1000	47	4	signed int
MTU 4 Power (now)		divide by 1000	47	4	signed int
MTU 3 Cost Per Hour (now)	\$/Hr	divide by 100	51	4	signed int
MTU 3 Cost Per Hour (now)		divide by 100	51	4	signed int
MTU 3 Voltage (now)	V	divide by 10	55	4	unsigned int
MTU 4 Voltage (now)		divide by 10	55	4	unsigned int
NUM MTU	0-3		59	1	byte
LQI			60	1	byte
RSSI			61	1	byte
			TOTAL	82	

MINUTE DATA PACKET

All data sent little endian (ie B1 = low byte B2 = high byte)

Data typically sent as integer (1.23 is sent as 123)

DESCRIPTION	UNITS	Notes	Starting slot	Size	Data Type
Packet Id	0-255		0	1	unsigned int
Display ID		hex serial id	1	3	byte
Today Cost	\$		4	4	signed int
NET MTD Power	kWh	divide by 1000	8	4	signed int
NET MTD Cost	\$	divide by 100	12	4	signed int
NET Projected Power	kWh	divide by 1000	16	4	signed int
NET Projected COST	\$	divide by 100	20	4	signed int
Peak Voltage Tdy	V	divide by 10	24	4	unsigned int
Peak Voltage Tdy Min	0-59		28	1	byte
Peak Voltage Tdy Hour	0-23		29	1	byte
Min Voltage Tdy	V	divide by 10	30	4	unsigned int
Min Voltage Tdy Min	0-59		34	1	byte
Min Voltage Tdy Hour	0-23		35	1	byte
Peak Pwr Tdy	kWh	divide by 1000	36	4	signed int
Peak Pwr Tdy Min	0-59		40	1	byte
Peak Pwr Tdy Hour	0-23		41	1	byte
Min Pwr Tdy	kWh	divide by 1000	42	4	signed int
Min Pwr Tdy Min	0-59		46	1	byte
Min PwrTdy Hour	0-23		47	1	byte
Peak Cost Tdy	\$	divide by 100	48	4	signed int
Peak Cost Tdy Min	0-59		52	1	byte
Peak Cost Tdy Hour	0-23		53	1	byte
Min Cost Tdy	\$	divide by 100	54	4	signed int
Min Cost Tdy Min	0-59		58	1	byte
Min Cost Tdy Hour	0-23		59	1	byte
CO2 Rate	lbs	divide by 100	60	4	signed int
Current Rate	\$	divide by 10000	64	4	unsigned int
Days Left In Billing Cycle	0-31		68	1	
STEP	0-5		69	1	
TOU	0-5		70	1	
SEASON	0-3		71	1	
			TOTAL	72	

SETUP DATA PACKET

All data sent little endian (ie B1 = low byte B2 = high byte)

Data typically sent as integer (1.23 is sent as 123)

DESCRIPTION	UNITS	Notes	Starting slot	Size	Data Type
Packet Id	0-255		0	1	unsigned int
Destination Display ID		hex serial id	1	3	byte
Num Display	0-4		4	1	byte
Configured Display ID's		hex serial id	5	12	unsigned char
BL Power (Normal)	percent		17	1	unsigned char
BL Power (Enhanced)	percent		18	1	
BL Battery (Normal)	percent		19	1	unsigned char
BL Battery (Enhanced)	percent		20	1	
BL Timer (Normal)	seconds		21	2	unsigned int
BL Timer (Enhanced)	seconds		23	2	
Scroll Timer (Normal)	seconds		25	2	unsigned int
NOT USED			27	2	
Sleep Timer	seconds		29	2	unsigned int
NOT USED			31	2	
Enhanced Mode Timer			33	1	unsigned char
RealTimeUseScreen	T/F		34	1	unsigned char
MonthToDateScreen	T/F		35	1	byte
MonthlyProjectionScreen	T/F		36	1	byte
VoltageScreen	T/F		37	1	byte
KWDetailScreen	T/F		38	1	byte
SpendingDetailTdyScreen	T/F		39	1	byte
CO2TodayScreen	T/F		40	1	byte
MultiPanel1Screen	T/F		41	1	byte
RecentUsageScreen	T/F		42	1	byte
NOT USED			43	1	NOT USED
Contrast	0-255		44	1	byte
TOTAL				45	

Setup data is used to transmit Display operation settings from the Gateway to the display unit. This data includes duration of timers (backlight, batter mode), visible screens, etc.