

Application Protocols

0x10 - GENERAL TELEMETRY

This is a binary name/value pair protocol for the transfer of sensor data. Any number of data items may be sent in a single packet, up to the limit of packet size. The packet would typically be sent as a broadcast. Other nodes may listen for and act (passively) upon General Telemetry packets without the involvement of the coordinator, facilitating peer to peer operation for many applications.

Byte	Function
0	Profile ID - Identifies profile and available data items
1	Group ID - System assigned group number for peer to peer data sharing
2	Item ID
3-n	Item data (1 to 4 bytes)
...	
N	Item ID
N-N+n	Item data (1 to 4 bytes)

Item IDs are defined per-profile. IDs are grouped by the top two bits depending on the length of the data item as shown below. The first 8 items in each group are reserved for data types common to all profiles.

Bits 7:6	Length of data item (bytes)
00	1
01	2
10	4
11	8

General Data

Item ID	Type	Description	Units
0x00	u8	General purpose input	Bitmask
0x40	u16	General purpose input	Bitmask
0x41	u16	Battery voltage	mV
0x80	u32	General purpose input	Bitmask
0x81	u32	Total run time	seconds

Profile ID is provided to enable other nodes to determine packet relevance, and is also used to define the set of data items which may be represented. This allows for extensibility. The following Profile IDs are defined:

Profile 0x00 - Environmental

For nodes returning general environmental data.

Item ID	Type	Description	Units
0x08	u8	Relative humidity	%
0x18	s16	Temperature	°C /100
		pH	
		Fluid level	
		Light level (visible)	
		Light level (UV)	
		Wind speed (average)	
		Wind speed (gust)	
		Wind direction	
		Rainfall	
		Atmospheric pressure	
		SPL mean	
		SPL peak	
		Gasses (move to its own app?)	
		CO	
		CO ₂	
		NO ₂	
		O ₃	
		O ₂	
		N ₂	

Profile 0x01 - HVAC

For Heating, Ventilation and Air Conditioning. Units may also accept room/external temperature data from devices broadcasting Environmental profile for the same group.

Item ID	Type	Description	Units
0x48	u16	Room temperature (TRV/thermostat)	°C /100
0x49	u16	Target temperature (TRV/thermostat)	°C /100
0x08	u8	Heating demand (TRV/thermostat)	/255
	u8	Cooling demand (TRV/thermostat)	/255
	u8	Ventilation fan speed	/255
	s16	Boiler water temperature	°C /100
		Boiler water pressure	
	u8	Boiler burner output	/255
	u8	AC cooling output	/255

Profile 0x02 - Energy Monitoring

Item ID	Type	Description	Units
		General (global for all apps?)	
0x00	u16	Battery voltage	mV
0x01		Run time	
0x02		GP input (bitmask)	
0x10		Current (brown)	
0x11		Voltage (brown)	
0x12		Power (brown)	
0x13		Power factor (brown)	
0x14		Current (grey)	
0x15		Voltage (grey)	
0x16		Power (grey)	
0x17		Power factor (grey)	
0x18		Current (black)	

0x19		Voltage (black)	
0x1A		Power (black)	
0x1B		Power factor (black)	
0x20		Meter pulse count (electricity)	
0x21		Meter pulse period (electricity)	
0x28		Meter pulse count (gas)	
0x29		Meter pulse period (gas)	
		Meter pulse count (water)	
		Meter pulse period (water)	

0xFF - OTA DEBUG/LOG SUBMISSION

This protocol is for use during development to enable a remote node to submit a log message to a central server.

Byte	Function
0	Log level
1...N	Message

The message may contain any text, but it is not intended for ANSI control codes to be used to apply formatting to differentiate message severity. Instead, the log level field shall be used and formatting may optionally be applied at the log server.