Packet field definitions are listed below.

- **SOP** (1 byte) – Start Of Packet, delineates the beginning of a packet, equal to: **0x02**
- **CMD** (1 byte) – Command
- **Length** (1 byte) – Length of the payload data in bytes
- **Payload** (1 to 50 bytes) – Data associated with the current command
- **EOP** (1 byte) – End Of Packet, delineates the end of a packet, equal to: **0x0A**

SOP	CMD	Length	Payload	EOP
1 byte	1 byte	1 byte	1 to 50 bytes	1 byte

Figure 2 - IOLab Packet Format With Data Payload

SOP	CMD	Length	EOP
1 byte	1 byte	1 byte	1 byte

Figure 3 - IOLab Packet Format Without Payload

5.3.2 DATA_FROM_REMOTE (0x41)

The data from remote packet is sent as data is received by the dongle from its paired remotes. This is expected to occur at 10 msec intervals from each remote.

CMD: 0x41

Response Payload Length: 5 to 104 bytes

Response Payload:

Remote Number	Frame Number	RF Statistics	Remote Data	RSSI
1 byte	1 byte	1 byte	1 to 100 bytes	1 byte

- Remote Number = remote that sent data. 1=Remote1, 2=Remote2
- Frame Number = current frame counter, incremented every 10 msec. If an RF message is not received in any given 10 msec frame, then no data packet with that frame number will be sent to the PC. This can be used to monitor "lost" RF packets
- RF Statistics = RF packet statistics. This byte indicates which of the four active frequencies was used in the reception of this packet. 0=Frequency 1, 1=Frequency 2, 2=Frequency 3, 3=Frequency 4
- Remote Data = data as received from remote
- RSSI = receive signal strength value of this received packet (from remote)

IOLab Sensor Data Structure Summary

2.1 DATA PACKET SENSOR PAYLOAD

The data packet sensor payload is used when sending sensor data samples. The payload of sensor data will always a fixed size, but not all of it is valid- there could be padded bytes at the end to make the payload length equal to the necessary number of bytes.

The sensor data payload is structured as shown here:

# of sensors	sensor id A	length A	data A_0	data A_1	…	data A_n	sensor id B	length B	data B_0	data B_1	…	data B_n	…

Figure 1: Sensor Data Payload Structure

- # of sensors – this byte indicates the number of sensors that are included in this payload.

- Sensor ID A –this byte is the ID number assigned to the sensor to which the data belongs. See Section 2.1.1 Sensor ID Format and Section 3.0 Sensor IDs & Key-Value Pairs for more information about this value.

- Length A – this byte contains the number of bytes of meaningful data that belong to the previous sensor ID.

- Data A_n – these bytes are the actual sensor data in the order which they were recorded. See section 4.0 Sensor Data Format for information about how the data for a specific sensor are formatted.

- Sensor ID B – this byte is the ID number assigned to the sensor to which the data belongs. See Section 2.1.1 Sensor ID Format and Section 3.0 Sensor IDs & Key-Value Pairs for more information about this value.

- Length B – this byte contains the number of bytes of meaningful data that belong to the previous sensor ID.

- Data B_n – these bytes are the actual sensor data in the order which they were recorded. See section 4.0 Sensor Data Format for information about how the data for a specific sensor are formatted.

5.2.9 GET_PACKET_CONFIG (0x28)

The get packet configuration command is used to retrieve the format of data packets received from the selected remote. The response payload contains a variable length packet depending on how many sensors have previously been configured. The Sensor ID and the Data Length are treated as a pair of data items, where 24 is the maximum allowed.

CMD: 0x28

Payload Length: 1 byte

Remote Number	Number of Sensor Data Length Values	Sensor ID 1	Data Length 1	Sensor ID 2	Data Length 2	….	Sensor ID 24	Data Length 24
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	….	1 byte	1 byte

- Remote Number = selected remote. 1=Remote1, 2=Remote2

- Number of Sensor Data Length Values = number of Sensor ID/Data Length pairs in this packet. Range: 1-24. Only active sensors in the remote are included in this list

- Sensor ID X = sensor selection

- Data Length X = data length field allocated for this sensor in incoming packets