RD-018

Description: IR transmission data compression method

Importance: Normal

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SmartNode by VDT

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1.0 Introduction:

IR is very widely used method to operate low distance devices and can work over 100s of feet line of site distances if properly implemented. For efficient use of hardware resources and limited RAM scenarios we used this proprietary compression method of data to achieve small size packets and low memory usage.

1.1 Uncompressing of data

Following is the sample of single button IR data derived from raw data.

{"cmd":"IRT","slave":"2022040518495301","token":"02281401edd9c6b29f93","protocol":"RAW","frequency":38167,"channel":"1","code":[115,1,35,35,50,35,50,51,34,51,34,34,51,35,51,51,51,51,50,35,51,34,51,35,51,51,51,51,51,51,51,35,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,35,51,50,34,64],"unique_cycle":[3020,3097,3019,4468,557,1659,557,559,557,0]}

First consider “unique_cycle” data, separating it in 5 different cycles below

Cycle ID	On time in microseconds	Off time in micro seconds
Cycle 0	3020	3097
Cycle 1	3019	4468
Cycle 2	557	1659
Cycle 3	557	559
Cycle 4	557	0

Table 1.0 Individual unique cycles present in raw data

Now let’s see “code” here. The first data in code is total number of cycle present in raw format. Here in example, it is 115 cycles. Those different cycles we already received in “unique_cycle” parameter, if we re-arrange those cycle 115 times then, we can replicate original raw data again.

Please remember that first data in “code” is total number of cycles, rest of “code” data are sequence of cycles from “unique_cycle”.

Now let’s decode above frame. Total cycle in raw data is 115.

2nd parameter in “code” is 1 if we write it in HEX, it will be 0x01 here the higher nibble is 0 and lower nibble is 1, so the first two cycle to send will be cycle 0 and cycle 1 (from table 1.0). 3rd parameter in “code” is 35 if we write it in HEX, it will be 0x23 here the higher nibble is 2 and lower nibble is 3, so the third and fourth cycle to send will be cycle 2 and cycle 3 (from table 1.0). If we continue re arrange the cycles from table 1.0 according to “code” data we will receive following RAW data

3020,3097,3019,4468,557,1659,557,559,557,1659,557,559,557,559,557,1659,557,1659,557,559,557,559,557,1659,557,559,557,559,557,1659,557,1659,557,559,557,559,557,1659,557,1659,557,1659,557,1659,557,559,557,559,557,1659,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,1659,557,1659,557,559,557,559,557,559,557,1659,557,1659,557,559,557,559,557,1659,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559, 557,559,557,559, 557,559,557,559,557,1659,557,559, 557,559,557,559, 557,559,557,559, 557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557, 559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559, 557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557,559,557, 559,557,559,557,559,557,559,557,559,557,559,557,1659,557,559,557,559,557,559,557,559,557,1659,557,1659,557,1659,557,0

Response of that Jason command will be as follows

{"cmd":"IRT","slave":"2022040518495301","status":"success","channel":1,"protocol":"RAW","frequency":38167,"code":[115,1,35,35,50,35,50,51,34,51,34,34,51,35,51,51,51,51,50,35,51,34,51,35,51,51,51,51,51,51,35,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,51,35,51,50,34,64],"unique_cycle":[3020,3097,3019,4468,557,1659,557,559,557,0],"serial":55}

2.0 Compression

To compress the raw data in our proprietary format the process is same as uncompressed but in reverse order. Please note that cycle variation of +-50 microseconds can be ignored. Example: 500,1000 (500 on time, 1000 off time) if on time is between 450 to 550 and off time 950 to 1050 can be replaced with this 500,1000 cycle.

3.0 Limitation

Please note that total unique cycle must not exceed 16 cycles. Current generation of Smart Node IR blaster do not support more than 16 unique cycles in “IRT” command.