

Note on Communication protocol

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In Online_v2 development we are using generic structure based communication protocol to communicate command & response between Online_v2 program and MCM rabbit card. Origin of this communication protocol is from 15 Meter NCRA CMS system. Where it's working without any problem for last one year. For our online_v2 development, we have trimmed and modified the structure to suit our GMRT sub-system requirement.

Connection is made using TCP/IP networking socket programming between Online_v2 and MCM program. Connection remains persistent means connections are not broken after exchanging information. Connections are broken only if MCM device is power off. State machine logic will be implemented afterwards which will handle the device timeout, link break thing.

Command Structure :

```
typedef struct
{
    int seq;                                // Unique Sequence
    char timestamp[64];                     // Timestamp of command
    char system_name[16];                   // System Name for which command is
    char op_name[16];                       // Operation to perform ( Init/Set/Mon/Reset )
    short int number_param;                 // Number of parameter
    char parameter_name[32][16];            // Parameter Name
    char Argument_Ch1[32][16];              // Channel One argument
    char Argument_Ch2[32][16];              // Channel Two argument
} cmd;
```

Response structure :

```
typedef struct
{
    int response_type;                      // Response type
    int seq;                                // Sequence number
    char timestamp[64];                     // Time stamp
    char system_name[16];                   // System name
```

```
char Mon_raw[64][8];           // 64 channel raw data
char Mon_sum[32][64];          // Monitoring summary prepared from 64 channel raw data
short int num_resp_msg;        // Number of Response Message
char response_message[32][64]; // Response message from MCM
} resp;
```

Size of command structure is 1638 bytes and size of response structure is 4698 bytes.

We have been using this generic communication protocol structure in C03 antenna testing & in two antenna 4 sub-system each Lab test set-up. We have not found any major problem related to communication. This generic structure based communication protocol is working very well for our Online_v2 need.

In term of reducing time interval, we are continuously working on it. With the help of powerful machines & optimization we will be able to reduce the time interval as well.

Comparison between Present Online, Teleset-Abccom & Online_v2 protocol :

Present Online do all the hex code generation and decoding in Online machine and pass it on to communication handler through PC router on a serial link @9.6 kbps. All the intelligence is in Online code.

Teleset-Abccom protocol differ in a sense that most of the intelligence has been shifted to Abccom software. Teleset only gives higher level ASCII command like English text for ex: if setnew set1.dat . Abccom will decode what it means by if setnew set1.dat, generate the corresponding hex code for that and send that to MCM 10 on serial link & get the response and form the response packet from the raw data sent by MCM 10 which can be sent to Teleset.

In Online_v2, all the bit pattern generation and decoding of response from raw data is done by MCM card so we just have to send higher level command from Online_v2 by an agreed upon communication protocol. We are following a structure based communication protocol where we are sending a command structure to a particular MCM card and we are getting a response structure. In Online_v2 most of the intelligence is shifted in the MCM card itself.