



National Centre for Radio Astrophysics

Technical Report
On
Miltec Machine Remote ON/OFF facility

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Index

1) <i>Abstract</i>	4
2) <i>Introduction</i>	4
3) <i>Hardware Connection details</i>	5
4) <i>Software details</i>	6
5) <i>Miltec Remote Switch On/Off Procedure</i>	7
6) <i>Conclusion</i>	10
7) <i>Future Work</i>	10

Abbreviations:

TGC	<i>Tango based GMRT Control and Monitoring system</i>
TANGO	<i>Taco based Next Generation Objects</i>
LMC	<i>Local Monitoring and Control</i>
MCM	<i>Monitoring and Control Module</i>
GMRT	<i>Giant Metrewave Radio Telescope</i>

Figures:

Fig 2.1	<i>TGC hardware's</i>
Fig 3.1	<i>Hardware Connection Block diagram</i>
Fig 3.2	<i>Detailed Hardware Connection (Miltec - rabbit)</i>
Fig 4.1	<i>Web page for Remote Firmware update</i>
Fig 5.1	<i>Monitoring Web page of C10 antenna</i>
Fig 5.2	<i>Control Web page of C10 antenna</i>
Fig 5.3	<i>Ping command response</i>
Fig 5.4	<i>LMC machine status of all 30 antennae</i>

1) Abstract

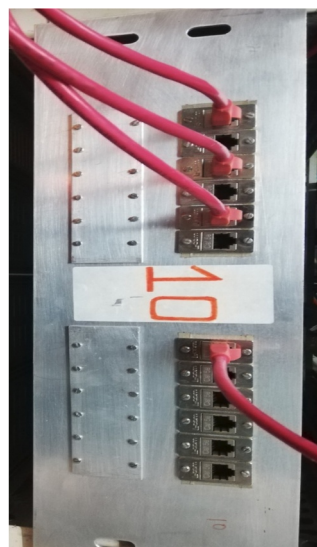
A new Tango based GMRT Control and monitor system (TGC) used improved hardware and software components, which is responsible for controlling the antennas and the electronics associated with it in addition to monitoring the parameters and the system performance. This Miltec based LMC machine installed at all 30 antennae. During Electric power failure, Miltec PC got shutdown and will not start at some antennae even after power restored. To power On Miltec machines need to visit antenna base and manually power On the machines. It was wastage of fuel, time and manpower. So we required one web base tool to power ON Miltec based LMC machine remotely to reduce downtime.

2) Introduction

TGC based Control & Monitor system used new powerful hardware such as Miltec based LMC machine, L2 / L3 Ethernet network switches and Rabbit (RCM 4300) based high speed microprocessor.



(a)



(b)



(c)

Fig 2.1) TGC hardware's

(a) Rabbit MCM card (b) Network Switch (c) Miltec Machine

To power ON Miltec machine remotely telemetry team suggested web based solutions. For that we have used existing antenna base *OFCST* Rabbit MCM card to give On/Off command to Miltec machine. *Mr. Charudutta Kanade* added one On/Off function in existing *OFCST* Rabbit dynamic C code. For that he has modified main.c, define.c and zhtml files. We have tested this new code at lab test setup and initially added this facility at C03 antenna base. We observed C03 antenna for a week and tested remote On/Off facility frequently by giving command through web page to check code robustness. But we noticed that after power glitch/failure web page will not load on browser (Rabbit Hang problem). We identified problem and as per the suggestion given by *Mr. Charudatta Kanade and Mr. Raju Upgrade*, we added patch code of this On/Off function in newly *OFCST* rabbit dynamic C code. Then we have initially uploaded bin file of new patch code at 10 antennae and observed it's functionality. This new patch code was working fine at all this 10 antennae without any problem even after power glitch or failure. So, we uploaded bin file of this new *OFCST* patch code at all 30 antennae using remote firmware update web page as explained in **section 4**.

3) Hardware Connection details

At antenna base *OFCST* Rabbit MCM card is used to control and monitor OFC and Sentinel system parameters. We used this rabbit control port two pins (*D06 and D07*) to give On/Off command to LMC machine. This control port pin is connected to On/Off switch circuitry of LMC machine through USB cables as shown in below **Fig 3.1**

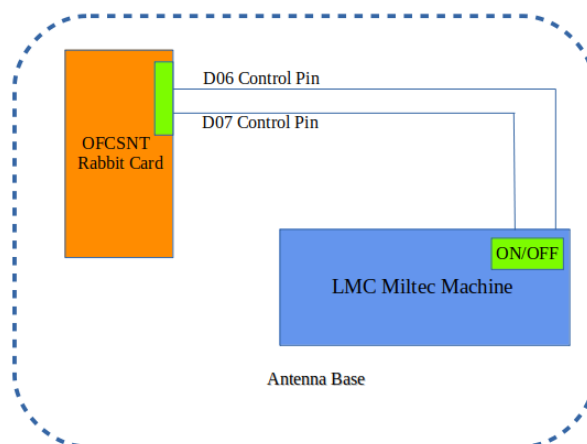


Fig 3.1) Hardware connection Block diagram

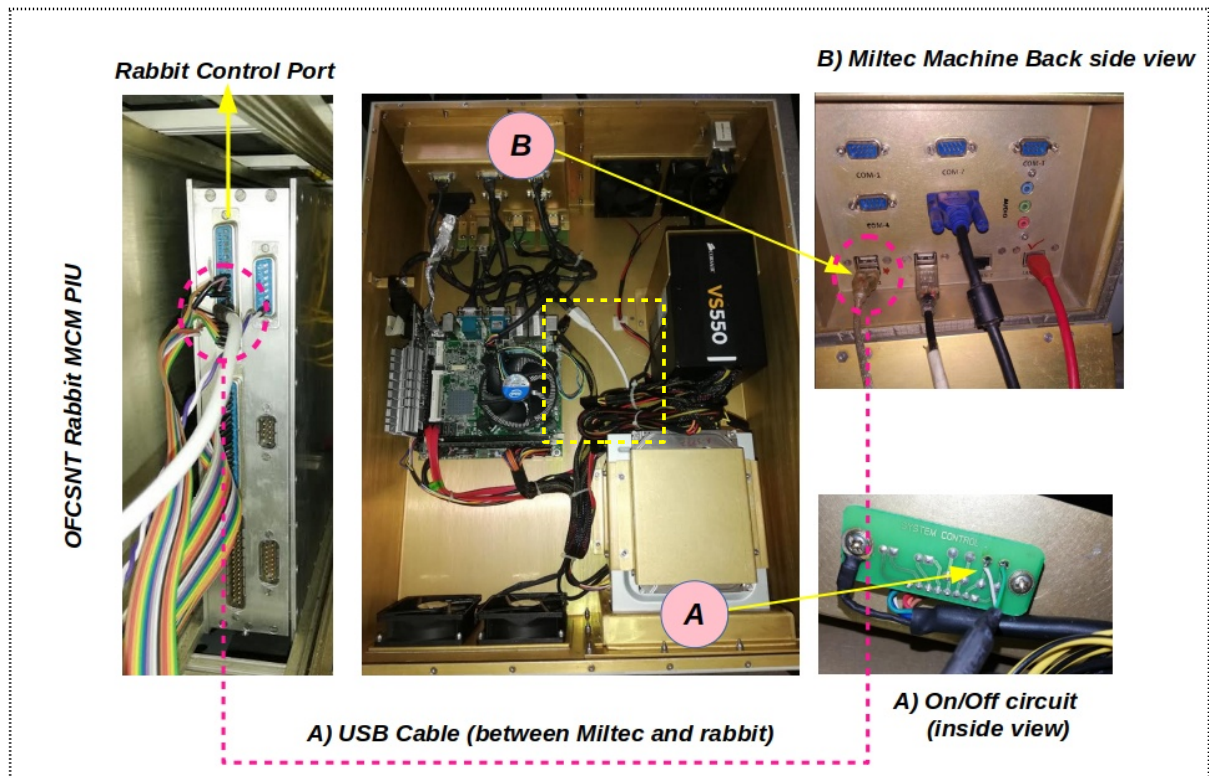


Fig 3.2) Detailed hardware connection (Miltec – Rabbit)

4) Software details

In existing OFCSNT Rabbit dynamic C code Mr. Charudutta Kanade added one Miltec On/Off loop in **main.c** file and also added remote On/Off tab in existing zhtml web page file. To upload this modified code bin file on each antenna (Rabbit MCM card) required to assign IP address, Gateway, Net mask and Server address in **define.c** file.

Example for C10 antenna **define.c** file network setting,

```
#define MY_IP_ADDR    "192.168.40.4" // OFC Rabbit MCM IP
#define MY_GATEWAY   "192.168.40.1"
#define MY_NET_MASK  "255.255.255.0"
```

```
#define OFC_SERVER_ADDR "192.168.40.2" // OFC server address
#define OFC_SERVER_PORT "3002"
```

Bin file generated through dynamic c software need to be uploaded on each antenna using remote firmware update web page as shown in below **Fig 4.1**

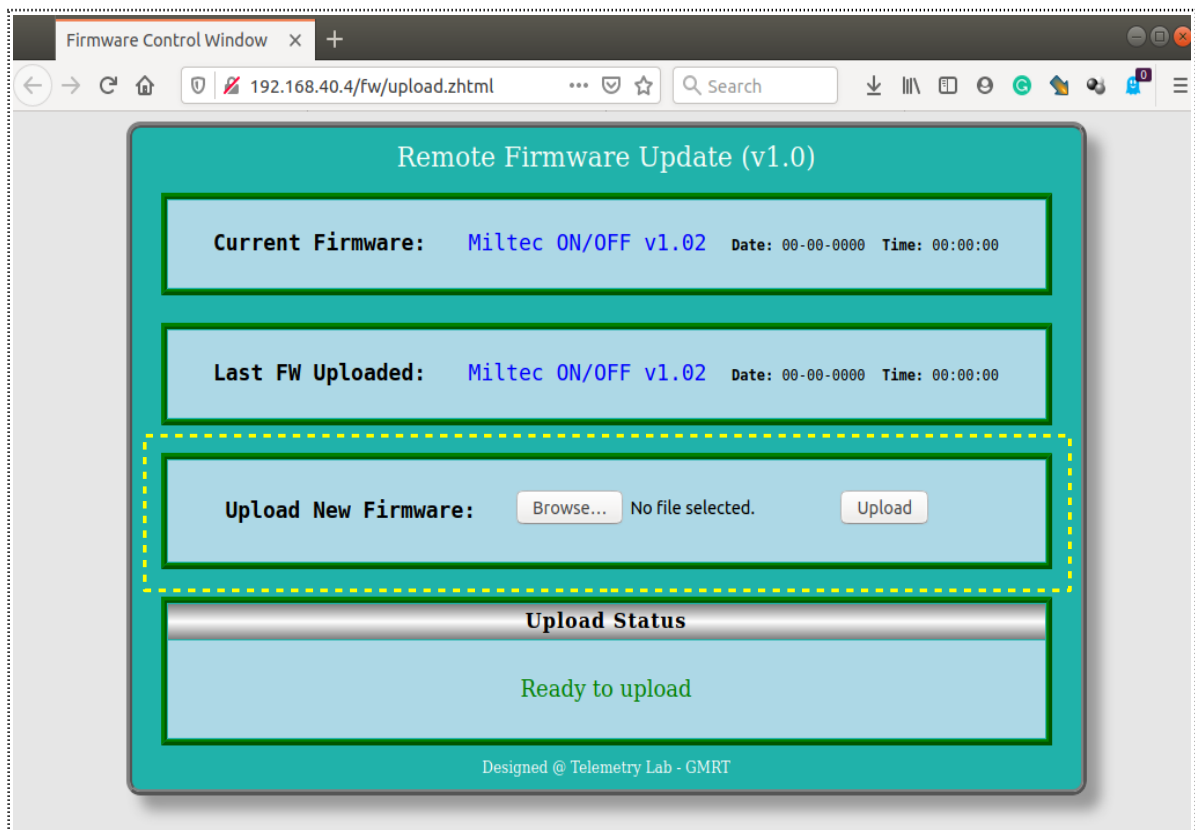


Fig 4.1) Web page for Remote firmware update

To upload new firmware bin file click on Browse button. Go to the directory where bin file of new firmware is placed. Select it and click on Upload button. Then click on Install button to install this firmware.

5) Miltec Remote Switch On/Off Procedure

Steps mentioned in this section requires to switch On/Off Miltec machine through web page.

- a) Open web browser in any PC connected to LAN.
- b) Enter IP address of particular antenna Rabbit OFCSNT card.

For example C10 antenna IP address is : **192.168.40.4**

- Once you open above IP in browser you will see the below web page of particular antenna (see *Fig 5.1*)

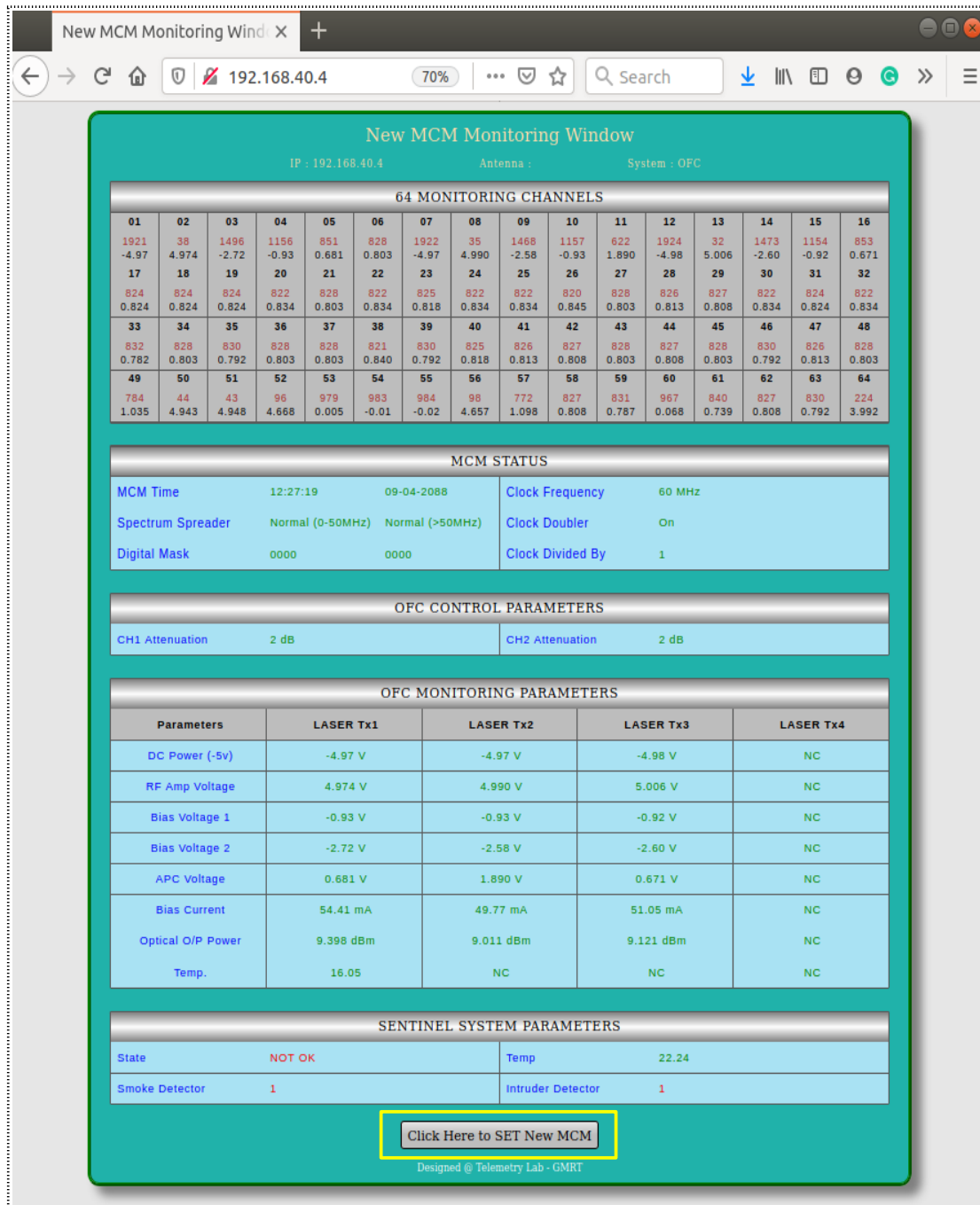


Fig 5.1) Monitoring web page of C10 antenna

- c) Then click on set new new MCM button, it will show you below control web page window (see *Fig 5.2*).

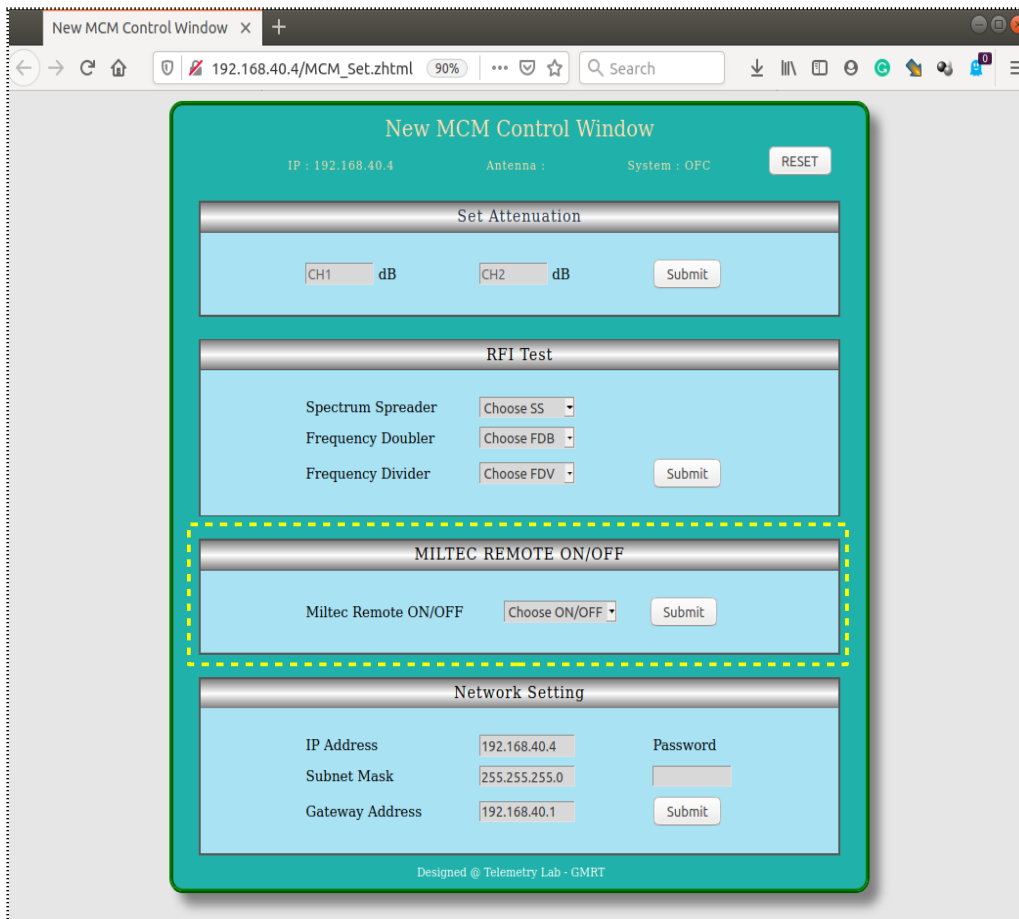


Fig 5.2) Control web page of C10 antenna

- d) Select command from Miltec Remote On/Off tab to switch On Miltec machines. Then click on submit button.
- e) Now you can check the status of LMC machine using **ping** command or **ping_LMC.py** script in terminal window.

Example (C10 LMC machine IP): **ping 192.168.40.2**

```
kunbibhavesb@tgc-6:~$ ping 192.168.40.2
PING 192.168.40.2 (192.168.40.2) 56(84) bytes of data.
64 bytes from 192.168.40.2: icmp_seq=1 ttl=62 time=0.258 ms
64 bytes from 192.168.40.2: icmp_seq=2 ttl=62 time=0.267 ms
64 bytes from 192.168.40.2: icmp_seq=3 ttl=62 time=0.298 ms
64 bytes from 192.168.40.2: icmp_seq=4 ttl=62 time=0.292 ms
64 bytes from 192.168.40.2: icmp_seq=5 ttl=62 time=0.331 ms
64 bytes from 192.168.40.2: icmp_seq=6 ttl=62 time=0.278 ms
64 bytes from 192.168.40.2: icmp_seq=7 ttl=62 time=0.367 ms
64 bytes from 192.168.40.2: icmp_seq=8 ttl=62 time=0.332 ms
```

Fig 5.3) Ping command response

```
kunbibhavesb@tgc-6:~/Python/Ping_Python$ python ping_LMC.py
C00 192.168.31.2 active
C01 192.168.32.2 active
C02 192.168.33.2 active
C03 192.168.34.2 inactive
C04 192.168.35.2 active
C05 192.168.36.2 active
C06 192.168.37.2 active
C08 192.168.38.2 active
C09 192.168.39.2 active
C10 192.168.40.2 active
C11 192.168.41.2 active
C12 192.168.42.2 active
C13 192.168.43.2 active
C14 192.168.44.2 active
E02 192.168.45.2 active
E03 192.168.46.2 active
E04 192.168.47.2 active
E05 192.168.48.2 active
E06 192.168.49.2 active
S01 192.168.50.2 active
S02 192.168.51.2 active
S03 192.168.52.2 active
S04 192.168.53.2 active
S06 192.168.54.2 active
W01 192.168.55.2 active
W02 192.168.56.2 active
W03 192.168.57.2 active
W04 192.168.58.2 active
```

active: LMC machine is ON
inactive: LMC machine is OFF

Fig 5.4) LMC machine status of all 30 antennae

Note: Once ON command submitted through web page to LMC machine, it will take approximately ~ 30 sec to boot up.

6) Conclusion

- Telemetry team has developed, tested, and installed the Remote On feature of Miltec machine using OFCSNT Rabbit card on all 30 antennae.
- This work reduce downtime.
- It saves manpower, fuel and time because, it avoid manual labour visit to particular antenna to power ON the Miltec machines.

7) Future Work

- In future scope, we will develop a master web page through which we can give ON command to selected antenna at one time.