

SRT RFoF Specification sheet.

The Sardinia Radio Telescope is the newest radio telescope built in Italy. Thanks to its dimensions (64m in diameter) and surface accuracy is a world class instrument for high frequency (more than 100GHz) observations. In particular, two wide band multi-feed (double polarization) receivers are under development in the Q- (33-50GHz) and W-band (77-116GHz), equipped with 19 and 9 horns respectively. Once completed, they will join a refurbished version of the 14 horns K-band (18-26.5GHz) receiver already installed on the antenna. All three multi-feed receivers have in common the same output of the first RF conversion which will be carried out on the antenna in the 1-18GHz frequency band. In order to share the same back end, which will be installed inside the main building 600m far from the antenna, an antenna remoting system based on RFoF technology able to transport all the 38 outputs (19 horns/2 polarizations) in the 1-18GHz band is needed.

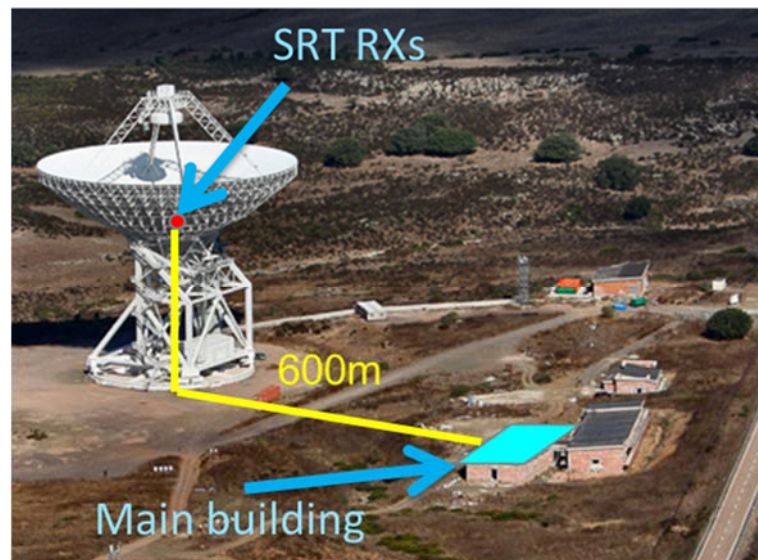


Figure 1. SRT antenna remoting system.

All specifications provided in Table 1 are to be intended as RFin to RFout of the RFoF link.

The specifications are also given considering the optical connections between OTX and ORX as sketched in Figure 2, in order to emulate the final installation at the antenna site.

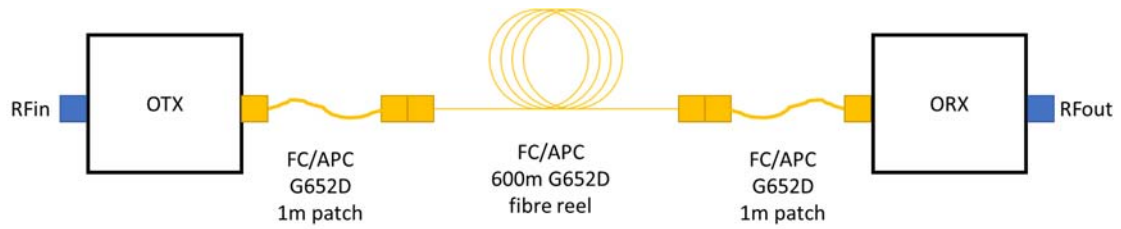


Figure 2. OTX-ORX optical connections.

Table 1. SRT RF specifications.

Parameter	Value	Unit	Notes
Frequency band	1-18	GHz	
Gain (mean value in band)	13-15	dB	Maximum spread among all modules less than 2dB
Gain flatness	+/-2	dB	Gmax-Gmin on overall 2-18GHz band less than 4dB
Gain Smoothness	+/-1	dB	Gmax-Gmin on 2GHz bandwidth less than 2dB
Input Return Loss	>12	dB	Minimum acceptable is 10dB
Output Return Loss	>12	dB	Minimum acceptable is 10dB
Max RF Input Power	-16	dBm	
Input P1dB	>-6	dBm	To have at least 10dB of margin from compression point
Input IP3	>+4	dBm	
Input IP2	>+14	dBm	
NF	<6	dB	On overall bandwidth

Table 2. Environmental, mechanical and interfaces specifications.

Optical Connectors	FC/APC
RF Connectors	SMA or equivalent/compatible
Power Supply	230VAC/50Hz (linear type preferred)
Nominal Operating Temperature (OTC and ORX)	15 to 30°C
Maximum Ambient Temperature Variation	+/-2°C
TX LED Indicator on front panel	GREEN=Optical Power Present, RED=No Optical Power
RX LED Indicator on front panel	GREEN=Optical Power Detected. RED=No Optical Power Detected
Mechanical Dimensions	At least 10 OTX (ORX) modules with the power supply should be taken place in a standard 19"/3U rack (depth TBD)

Note on the environmental specifications: both OTX and ORX will be installed in protected environment with controlled temperature. No high vibrations are expected for both OTX/antenna side and ORX/main building. During the observations the antenna is moving very slowly.