



# Interface control document for the MRO 4 – 8 GHz ambient temperature receiver system

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## TABLE OF CONTENTS

1. Introduction .....	3
1.1. Scope.....	3
2. References .....	3
2.1. Applicable documents.....	3
2.2. Reference documents .....	3
3. Overview .....	4
4. Interfaces .....	4
4.1. RF .....	4
4.2. Power .....	5
4.3. Data .....	5
4.4. Mechanical.....	6
4.4.1. Receiver outer dimensions including mounting brackets: 554 x 734 x 265 mm. ....	6
4.4.2. Receiver outer dimensions excluding mounting brackets: 500 x 700 x 250 mm. ....	6
4.4.3. Mounting bracket: Standard Rittal "SZ 2508.100", supplied with the receiver. ....	6

# 1. Introduction

## 1.1. Scope

The document describes the mechanical, electrical, and RF interfaces for the 4-8 GHz receiver system developed by Custom RF Labs for Metsähovi Radio Observatory.

# 2. References

## 2.1. Applicable documents

The following documents are applicable to the extent stated herein. In the event of conflict between the contents of the applicable documents and this document, the applicable documents shall take precedence

- [1] B. Billade, "MRO receiver interface control document", Rev. 1, 2017-10-21.

## 2.2. Reference documents

The following documents are referenced in this document. In the event of conflict between the contents of the referenced documents and this document, this document shall take precedence.

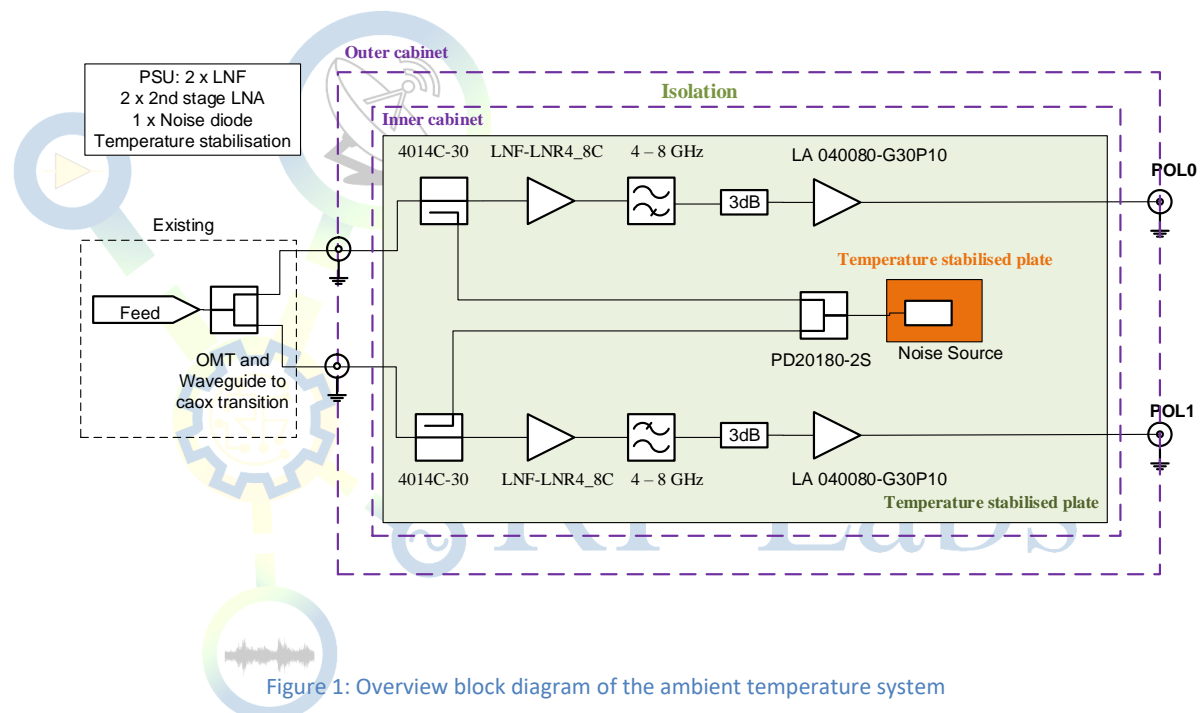
- [2] M. Pantaleev, "Technical description for 4 – 8 GHz ambient temperature receiver system for MRO" CRF-MRO-TD-001, Rev. A, 2017-08-20.

### 3. Overview

Figure 1 shows the block diagram of the MRO receiver. In order to achieve thermal isolation, we have adopted design with two cabinets. Both cabinets are metallic, with isolation material between the two cabinets.

Two independent PID loops are implemented, one to temperature control the base plate of the inner cabinet to temperature around 25° C, and another loop to regulate the temperature of the noise diode to around 40° C.

Both temperature loops use heaters only, and no cooling is implemented in the system. In case the ambient temperature exceeds the PID control temperature, the heater current could reduce to zero.



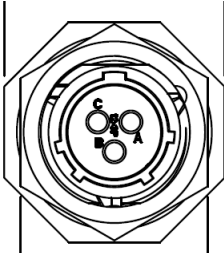
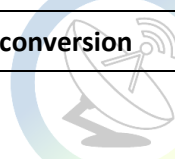
### 4. Interfaces

The interfaces are as per [1]

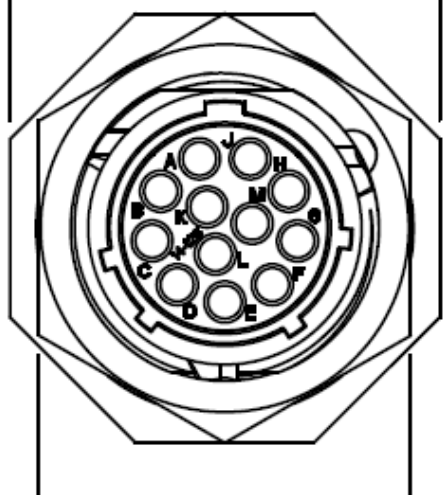
#### 4.1. RF

Position	Connector Type	Orientation	Part Number
RF input (2X)	N-Type	Female	H&S: 34_N-50-0-1/133_NE
RF input (2X)	N-Type	Female	H&S: 34_N-50-0-1/133_NE

## 4.2. Power

Connector Type	Orientation	Part Number/Pinout
3- pole Circular Panel mount	Male	Amphenol: RT0712-3PNH
	Pin A	Ground
	Pin B	Line
	Pin C	Neutral
Mains Power Interface	230 VAC @50 Hz	
Internal AC/DC conversion	Voltage	Type
	+ - 15 VDC	Using switched mode power supply
	+ 15 VDC	Using switched mode power supply
	+15/24 VDC	Using switched mode power supply
Connector details: <a href="http://www.amphenol-sine.com/pdf/datasheet/RT07123PNH-K.pdf">http://www.amphenol-sine.com/pdf/datasheet/RT07123PNH-K.pdf</a>		

## 4.3. Data

Connector Type	Orientation	Part Number/Pinout
12- pole Circular Panel mount	Female	Amphenol: RT0714-12SNH
	Pin A	Noise diode Temp Sensor (-)
	Pin B	Noise diode Temp Sensor (+)
	Pin C	Base plate Temp Sensor (-)
	Pin D	Base plate Temp Sensor (+)
	Pin E	POL 0 LNA: ID_Mon
	Pin F	POL 0 LNA: VD_Mon
	Pin G	POL 1 LNA: ID_Mon
	Pin H	POL 1 LNA: VD_Mon
	Pin L	Noise Diode TTL Control (+)
	Pin M	Noise Diode TTL TTL Control (-)
Connector details: <a href="http://www.amphenol-sine.com/pdf/datasheet/RT071412SNH-K.pdf">http://www.amphenol-sine.com/pdf/datasheet/RT071412SNH-K.pdf</a>		

## 4.4. Mechanical

4.4.1. Receiver outer dimensions including mounting brackets: 554 x 734 x 265 mm.

4.4.2. Receiver outer dimensions excluding mounting brackets: 500 x 700 x 250 mm.

4.4.3. Mounting bracket: Standard Rittal "SZ 2508.100", supplied with the receiver.

