

ARF20 Analog User Guide



PRESENTATION	3
PRODUCT POWER SUPPLY	3
ASSOCIATING A TRANSMITTER TO A RECEIVER	4
<i>0-20 mA input</i>	5
<i>0-5 V input</i>	6
<i>0-10 V input</i>	6
ANTENNA WIRING	7
<i>0-5 V output</i>	8
<i>Serial link output</i>	9
SYNCHRONISE MODE	11
TECHNICAL DATA	12
<i>Transmitter</i>	12
<i>Receiver:</i>	12
<i>Communication channels</i>	12
<i>Conversion</i>	12
<i>Dimensions</i>	12
<i>References</i>	12

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN45014



Manufacturer's name: **ADEUNIS R.F.**
Manufacturer's address: Parc technologique PRE ROUX IV
283 rue Paul Louis NEEL
38920 CROLLES - FRANCE

declares that the product

Product Name: ARF20
Product Number(s): ARF6493B / ARF6494B
Product options:

conforms to the RTTE Directive 99/5/EC :

EMC: conformity is proven by compliance to the standard EN 301489 according to the requirements of EMC Directive 89/336/EEC.

Safety: conformity to the standard EN 60950 according to the requirements of Low Voltage Directive 73/23/EEC.

Radio: conformity is proven by compliance to harmonised standard EN 300220 covering essential radio requirements of the RTTE directive.

Notes: - Conformity has been evaluated according to the procedure described in Annex III of the RTTE directive.
- The use of the spectrum is harmonised by the fact that the product never falls in one of the restrictions listed in appendix 3 (Annex 1, band E) of the CEPT recommendation 70-03.
- Receiver class (if applicable): 2.

Crolles, April 4th, 2001

VINCENT Hervé / Quality manager

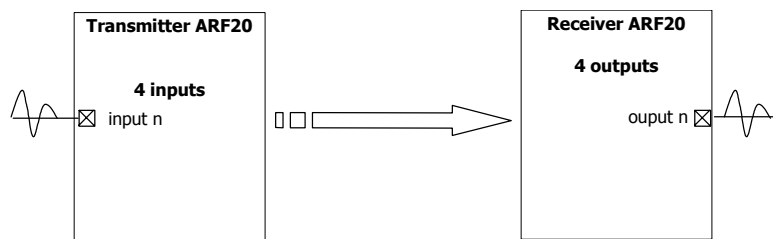
PRESENTATION

The ARF20 system enables four analogic values to be transmitted from one point to another. It is a unidirectional system - the transmitter converts and transmits the values by radio channel, and the receiver decodes the message received and restores the values. The values can be either voltages between 0 and 5V (10V) or a current comprised between 0 and 20 mA.

The transmitter scans its inputs continuously and triggers a radio transmission every 100 ms.

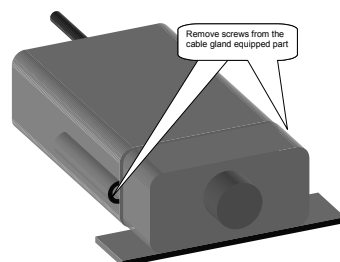
The link between a transmitter and one or more receivers is only effective after a learning phase.

The products are available either in card version to be integrated in an assembly or in an IP65 enclosure.

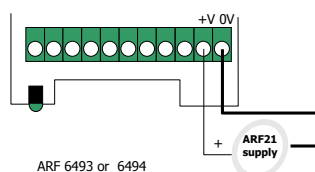


PRODUCT POWER SUPPLY

To perform wiring of these products, the bottom part of the housing (part with stuffing box) has to be opened by unscrewing the two black screws on each side.

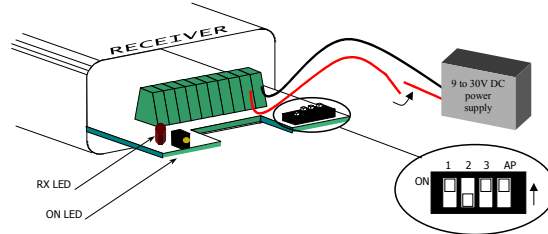


The ARF20 range products are supplied with a **DC voltage** supply. This supply should not exceed $30 V_{DC}$

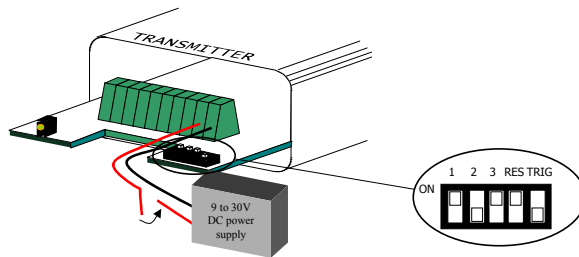


ASSOCIATING A TRANSMITTER TO A RECEIVER

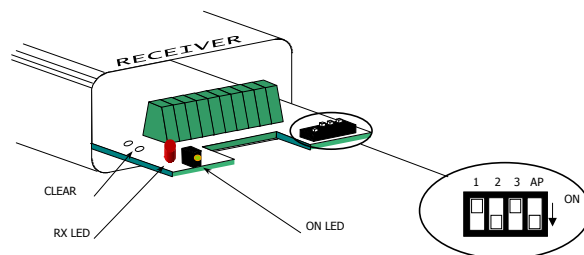
The red RX and green ON leds do not light: there is no transmitter associated to the receiver.
Set the AP switch to ON to switch to learning mode. The green led flashes.



The address switches (ADD 1, 2 and 3) must be in the same position on the transmitter and receiver. These two pieces of equipment must be at least 3m apart. Power on the transmitter to be associated to the receiver in learning mode.



After a few seconds, set the learning switch AP on the receiver to OFF. The red RX and green ON leds should light up continuously. If the red RX led lights intermittently, this indicates transmission losses. When transmission is interrupted the red led remains shut.



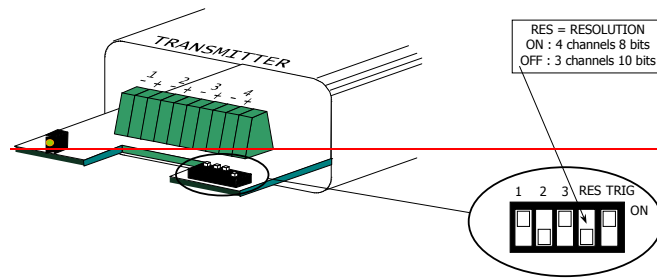
- **Memory clear**

To clear all the recorded serial numbers from the receiver memory, short-circuit the two pads marked "EFFACE" for more than 5 seconds. End of clearing is indicated by the green ON led flashing quicker.

When the operation has been successfully performed, the ON and RX leds remain shut. To make the product operate again, go back to the beginning of paragraph 4.

INPUT WIRING

The inputs are wired on the transmitter.

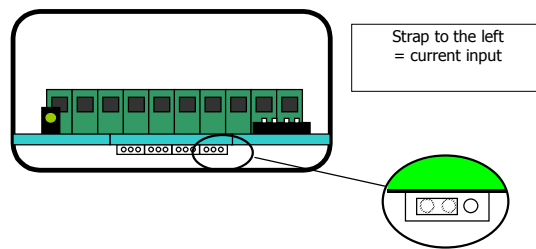


The channels are independent: they can be either a voltage or a current read. Full scale is respectively 0-5V or 0-20mA.

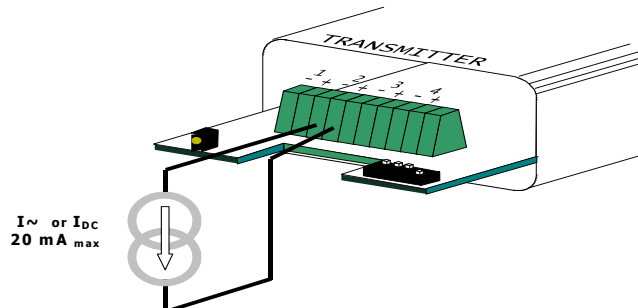
The choice of the value to convert is made by moving the strap under the input terminal block.

Wiring can be performed with a 10-conductor 24 AWG multicore cable. For long connections, twisted multipair wires are recommended. The external diameter of the wire must be 6.5 mm maximum.

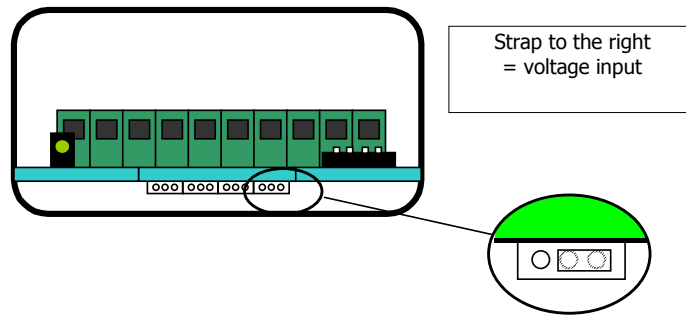
- 0-20 mA input



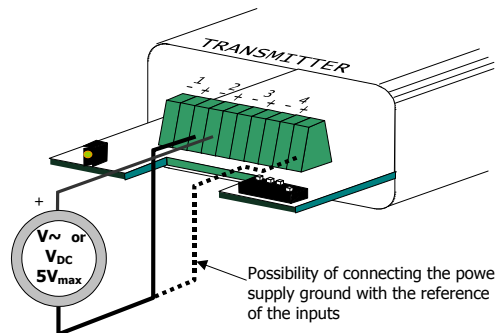
The current loop, output from the sensor, must be wired so that the current is input via the + terminal and output via the - terminal:



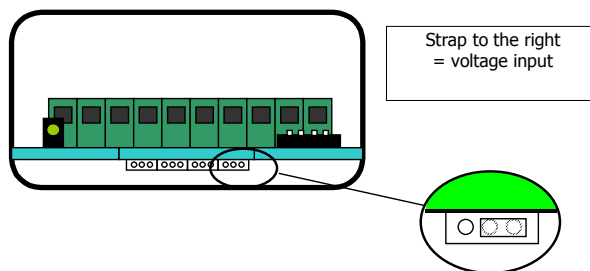
- 0-5 V input



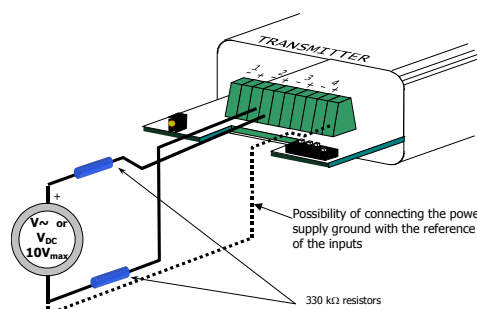
The voltage reference must be connected to the – terminal of the input concerned, and the voltage to be converted to the + terminal of this same input:



- 0-10 V input



The voltage reference must be connected to the – terminal of the input concerned via a 330 k Ω series resistor. The voltage to be converted to the + terminal via a 330 k Ω series resistor of this same input:



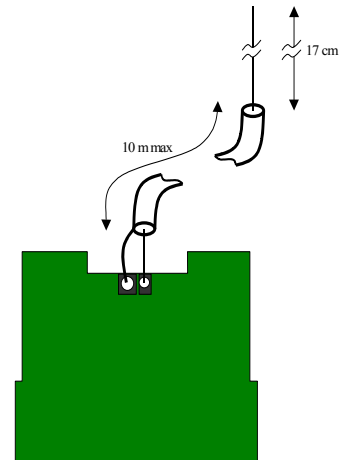
CAUTION: in this case the outputs remain between 0 and 5 V, there is a division by two.

ANTENNA WIRING

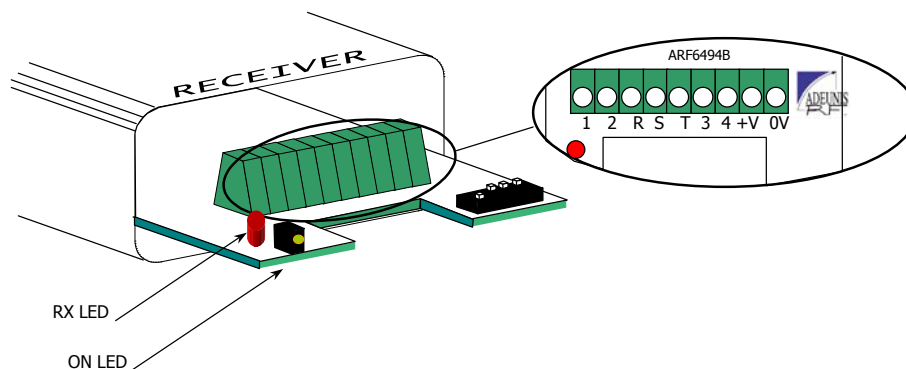
In daughter card version, an antenna has to be added to obtain correct communication between the products.

This antenna should be a wire with a length of $\frac{1}{4}$ wave i.e. about 17 cm. This length is that which has to extend outside the housing if the latter is metallic.

This antenna can be located remotely by using a coaxial cable with its braid stripped over the last 17 centimetres.



OUTPUT WIRING



The outputs are wired on the receiver.

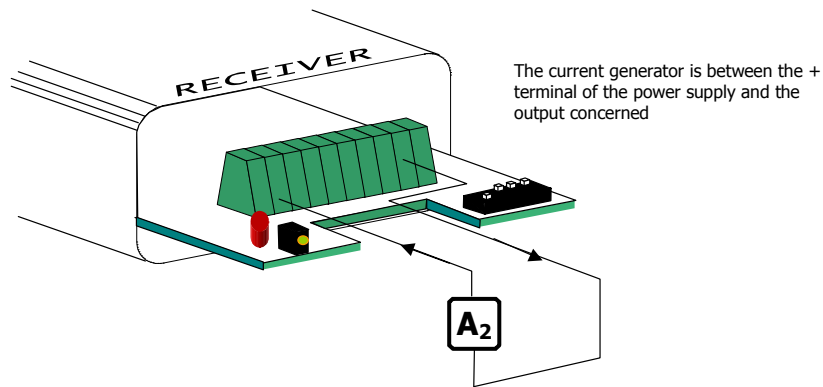
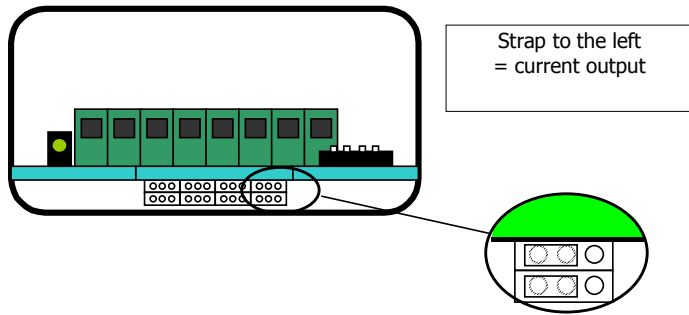
The outputs are independent from one another and from the nature (voltage or current) of the inputs. The type of output is changed by moving the two corresponding straps horizontally

Output 1 copies the level on input 1, output 2 that of input 2, etc.

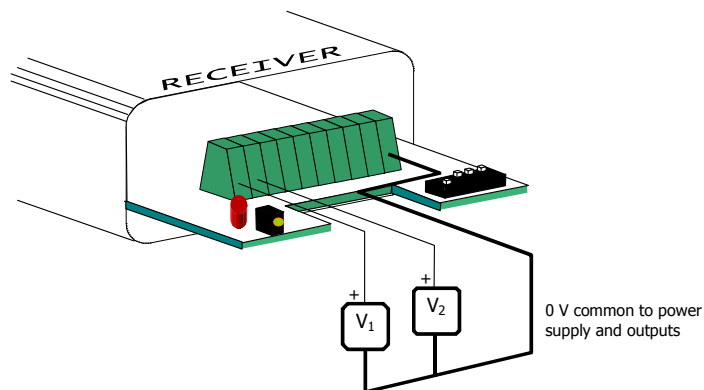
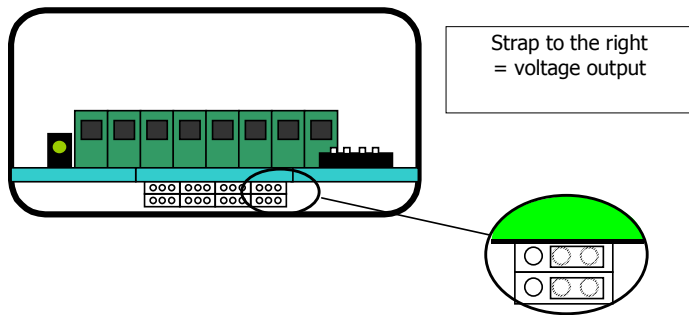
However, the use of the ARF20 system for conversion purposes introduces an error of 10% compared with the expected result. e.g.: a voltage of 2.5V on input which on output should supply a current of 10 mA will deliver 11 mA. Inversely, a current loop generating 4 mA which would correspond to a voltage of 1V will generate a voltage of 0.9V.

The receiver also has a TTL level series data output (S) and a data validity output (R).

- 0-20 mA output

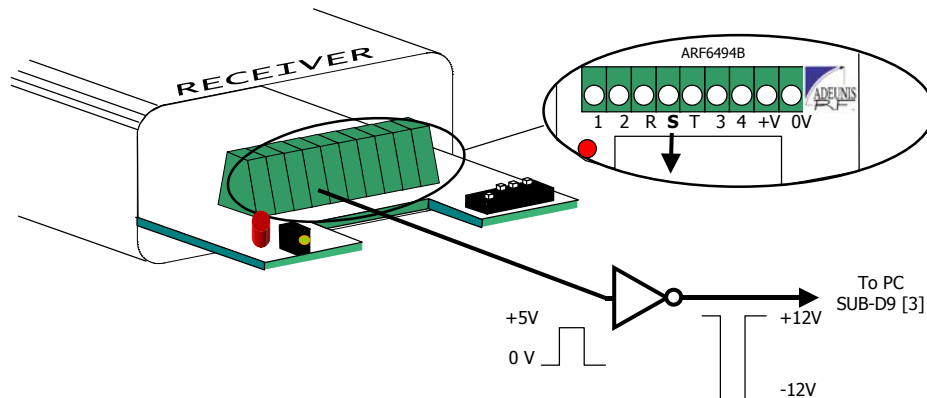


- 0-5 V output



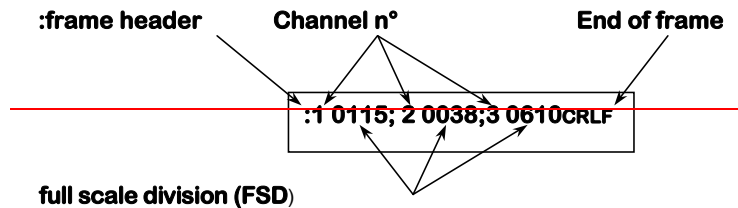
The voltages generated are available between the 0V of the power supply and the outputs.

- Serial link output

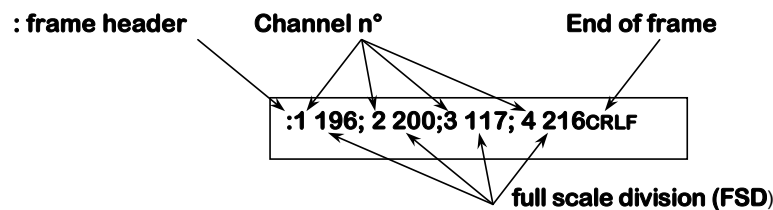


This output is on the terminal marked S. It supplies at 9600 bauds, 8 bits with no parity 1 stop, 8N1, the ASCII string described hereafter.

Electrically it delivers TTL levels that have to be converted into RS232 for example to connect to a PC.



4 CHANNELS ON 8 BITS



In the example above

- ❑ channel 1 equals: $196/256 = 0.766.FSD$
- ❑ channel 2: $200/256 = 0.781.FSD$
- ❑ channel 3: $117/256 = 0.457.FSD$
- ❑ channel 4: $216/256 = 0.844.FSD$

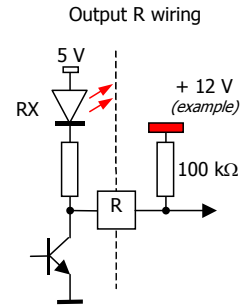
N.B. Depending on the cases FSD = 5V or 20 mA.

- **Validity output**

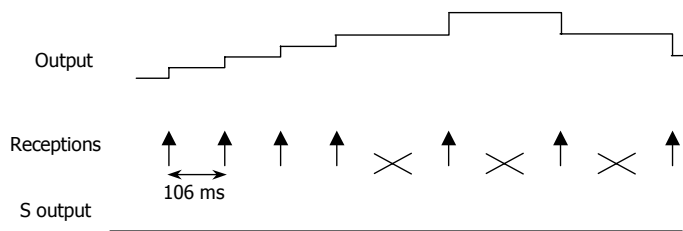
This is an **Open Collector** output: it is marked R on the terminal block.

It is at 0V when the receiver is receiving correctly and at high level when receipt is bad. The red led RX indicates the state of this output: On - receipt is correct, Off - no receipt.

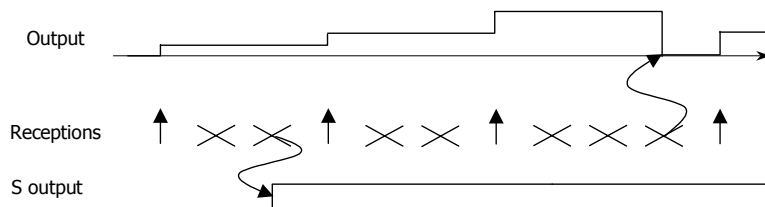
It is not a linear output. This enables a zero output level due to absence of receipt to be differentiated from that due to a zero level on input.



① All the receipts are correct, or one is missing, the outputs are updated regularly.

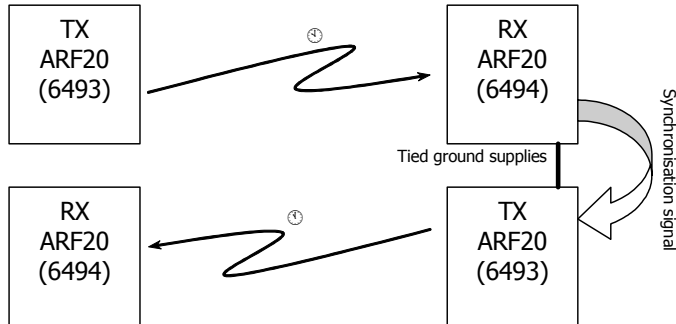


② Two receptions are missing, the "S" output is turn on. At the third missing reception in a row outputs go back to GND level or 0 mA.



SYNCHRONISE MODE

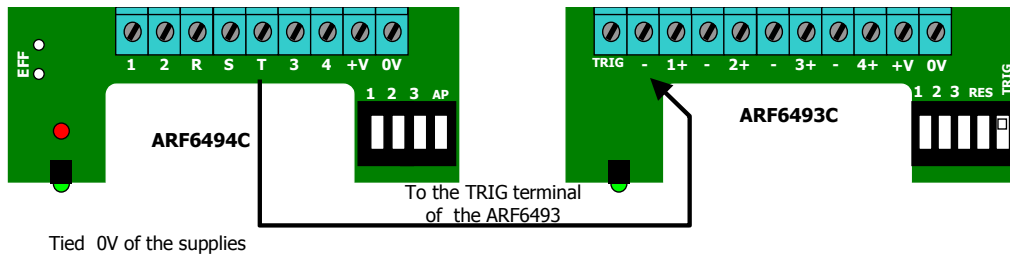
This mode allows bi-directional communication with 2 pairs of ARF20. With this functioning the return link is controlled by the first link.



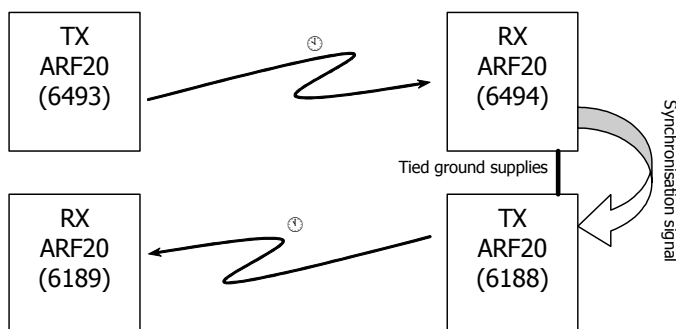
Number (2) transmission is being processed only when the link (1) is performed.

Putting an emitter in synchronise mode is done by positioning switch n°5 marked TRIG on ON.

Then tied the synchronisation output of the receiver of the link (1) (terminal marked "T" / ARF6493) with the terminal tagged TRIG of the emitter of the link (2).



NB: It is potential to synchronise an ARF20 system and vice versa.



TECHNICAL DATA

Transmitter

- Power: 10 mW / 50 Ω.
- Four 8-bit inputs
- Consumption: 30 mA.
- Operating temperature -20°C / + 70°C

Receiver

- Sensitivity: better than 1,2 μV.
- Four 8-bit outputs
(depending on associated transmitter).
- Serial data output.
- Receipt quality output.
- Consumption: 53 mA except output.
- Operating temperature -20°C / + 70°C

Communication channels

ADDRESS	SW3	SW2	SW1	Low channel	Middle channel	High channel
1	ON	ON	OFF	1 (433,125)	22 (433,650)	45 (434,225)
2	ON	OFF	ON	4 (433,200)	25 (433,725)	48 (434,300)
3	ON	OFF	OFF	7 (433,275)	28 (433,800)	51 (434,375)
4	OFF	ON	ON	10 (433,350)	31 (433,875)	54 (434,450)
5	OFF	ON	OFF	13 (433,425)	34 (433,950)	57 (434,525)
6	OFF	OFF	ON	16 (433,500)	39 (434,075)	60 (434,600)
7	OFF	OFF	OFF	19 (433,575)	42 (434,150)	63 (434,675)
0	ON	ON	ON			

Conversion

- 0-5 V or 0-20 mA inputs by moving a strap.
- 0-5 V or 0-20 mA outputs by moving 2 straps.
- Sampling period: 106 ms.
- Precision 1%, temperature variation ± 1 LSB.

Dimensions

- IP65 chip: 104 x 300 x 35 mm
- Distance between fixing points: 4 holes diam. 4 to 92 x 61 mm

References

- ARF6493A: ARF20 transmitter card version
- ARF6493B: ARF20 transmitter IP65 full chip
- ARF6494A: ARF20 receiver card version
- ARF6494B: ARF20 receiver IP65 full chip
- ARF03: Antenna kit for card version ARF649xA