Fax. +421 2 4594 5100
e-mail : support@microham.com
url : www.microham.com

Content

1. Warranty

microHAM offer for this product life time warranty.
The product must not be modified in any way, otherwise the warranty voids.
microHAM assumes no responsibility for damages on other devices or injuries on persons, as a consequence of using this products.

2. Packing

The product includes micro DOUBLE SIX SWITCH 1 piece, 2 x 5 m (16.4ft) of 6 x 0,14mm2 (AWG26) shielded control cables terminated by DB25M connectors for direct connection to micro Band Decoder™, printed manual and a fixture.

Please check the content of the shipment against this list. If the shipment is incomplete, please contact us at the following address:

support@microham.com or

fax : +421 2 4594 5100, or

by regular mail to :

microHAM
Matuskovo 709
92501
Slovakia

3. Important warnings

!!! Never operate the antenna switch with open top lid !!!

!!! When installing at elevated site, keep the necessary safety precautions !!!

!!! Protect the inside of switch from humidity !!!

!!! Always use shielded cable, if the provided cable is not suitable !!!

4. Quick start

- Place the antenna switch to a convenient place in your hamshack. If situated inside hamshack, the switch can be oriented any way.
- Fix the antenna switch to the chosen position using the L-fixture or using 4 screws 6x30 mm.
- Connect the DB25M connectors, terminating the cables, to connectors on micro Band Decoder marked BAND DATA OUTPUTS.

Immediately after micro Band Decoders are switched on, the antenna switch switches to the appropriate ports corresponding to the band identified by the decoders. The switch is preset according to the following table :

Band	***Port***
160	1
80	2
40	3
20	4
15	5
10	6

Table 1

5. Parameters

Frequency range : 0 - 30 MHz
Characteristic impedance : 50 ohm
Number of antenna ports : 6
Number of inputs : 2
Supply voltage : 9 - 16V on the required port against ground
Consumption : max. 180mA
Isolation voltage of relays : 10KV
Connectors : PTFE SO239 or N, depending on version

SWR :	2 MHz	< 1.03 *
	30 MHz	< 1.06 *
Insertion loss :	2 MHz	< 0.01 dB *
	30 MHz	< 0.05 dB *
Isolation :	2 MHz	80 - 115 dB **
	30 MHz	60 - 90 dB **

* values are typical
** depending on antenna port

Guaranteed power rating :

SWR < 1.3	30 MHz	< 5KW
SWR < 2	30 MHz	< 3KW
SWR < 3	30 MHz	< 2KW

Operating temperature range : -35 .. +70 C (-31.. 158 F)

Dimensions : W 220mm (8,66") x H 103 mm (4") x D 120 mm (4.72")

Weight : 2,4 kg (5.29 lbs) + 1,1 kg (2.42 lbs) fixture

6. Description

micro DOUBLE SIX SWITCH ("antenna switch") is a remotely controlled antenna switch. It can switch six antennas to a two outputs. It can be installed either in the shack, or on the towee. The switch is designed for switching 6 antennas to two radios, for SO2R operation.

7. Characteristics and functions

- 6 antenna positions enable to use an independent antenna for every band
- excellent separation between both input and antenna ports
- massive cast aluminium enclosure (wall thickness 4mm (158 mils) class IP 66 guarantees a high level of protection against weather and RF interference
- relays have insulation voltage of 10KV, covered, contacts are of high silver content alloy
- microstrip PCB architecture with a compensated stub grants low values of SWR and insertion loss in the range of 1.7 to 30 MHz
- integrated surge protection for control lines
- compatible with every band decoder with 12V source output
- directly connectible to micro Band Decoder™
- lid screws are secured against fallout
- easily installable to wall or to tower using a massive fixture in the shape of double C, enabling to install on tube of various diameters
- all antenna ports are grounded without power
- all unselected antenna ports are grounded
- double protection for using same port from two inputs

8. Installation

The antenna switch is intended to be used both in interior and exterior, with according installation procedure.

Installing inside the shack

If the switch is operated inside the shack, it can be installed in any position. It can be installed onto the wall using 4 screws (see Fig.1)

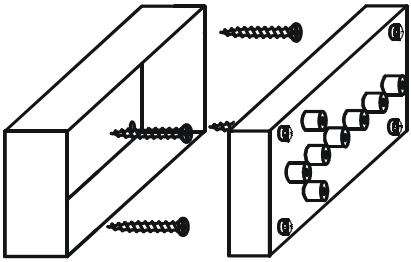


Fig. 1

or using the L-fixture, connectors up, or down (see Fig.2).

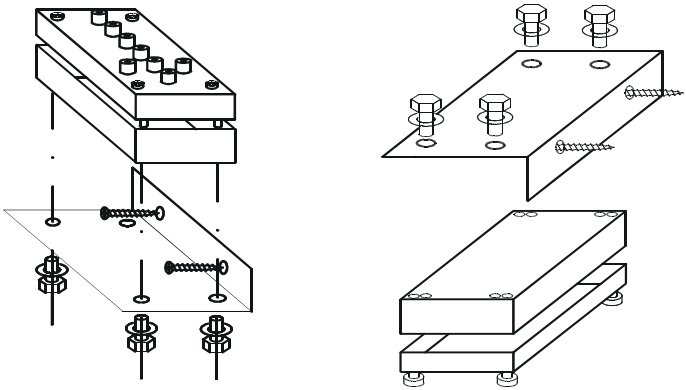


Fig. 2

If the preset configuration is suitable (i.e. separate port for each band), simply connect the antenna switch to micro Band Decoders : connect both the DB25M connector terminating the cable to connector on micro Band Decoder marked BAND DATA OUTPUTS, or to any other band decoders providing 12V source output for the decoded band.
If the preset configuration is not appropriate, the antenna switch can be reconfigured as needed - see chapter Configuration.
If necessary, the cable can be replaced by a shorter or longer as needed. Use a shielded cable. After cable replacement, check, if voltage on the chosen port is at least 9V. If the voltage is lower, the relay may operate unreliably.
In case of longer cable we recommend to use a relay box or micro Antenna Selector, but this is not necessary.

Installing outside the shack :

When installed outside the shack on a tower, the orientation of switch is of great importance. Placing the switch in other way than connectors down may result in humidity leaking inside the enclosure, this consequently may adversely influence function, expected lifetime and even may result in a failure of the switch. Always install the switch in position with **connectors down !** Use the L-fixture and the double-C-fixture. First install the fixture to the tower: position the part **(1)** next to part **(2)**. Push screws **(3)** through these parts. Fix the screws inside part **(2)** using washers and nuts. Place these parts on the tower, from back side push part **(2)** onto the screws with teeth to the mast, and fix using washers and nuts. Then using 4 screws **(4)** install the box of the antenna switch. Finally attach the antenna switch lid using 4 screws from the bottom side. The installation procedure is illustrated on Fig. 3.

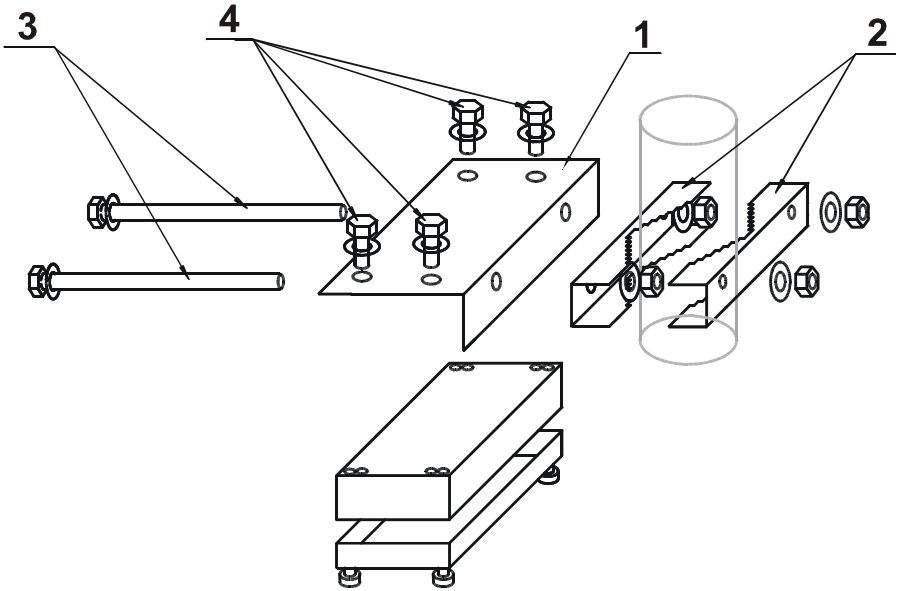


Fig.3

Before fixing the switch lid, carefully dry the whole box and the lid, optionally insert humidity absorber into the box.
After installation and functional testing fix and tighten all connectors and insulate them using a suitable tape. Insulate also all unused ports or use protection caps.
When operating the antenna switch outside the shack, it is necessary to use a relay box (RELAY BOARD) or Antenna Selector; otherways the Band Decoder may become damaged.

9. Configuration

The antenna switch enables to switch 6 antenna ports. The basic preset configuration is such that every band from 160m to 10m has assigned one antenna port, port 1 assigned to 160m, port 2 to 80m etc.
For details see the following table :

Band	*Color in the supplied cable*	*DB25M connector pin*	*Antenna port*
160	yellow	20	1
80	pink	21	2
40	brown	22	3
20	white	23	4
15	green	24	5
10	grey	25	6
GND		18 , 19	

Table 2

If there are more antennas on one band, you should switch them using an micro Band Decoder (2 ANTs) or use Antenna Selector (any ANTs). For micro Band Decoder OUTPUTS configuration, please look into micro Band Decoder manual.
If using the antenna switch outside the shack on the tower, you have to insert a relay board or Antenna Selector between the Antenna Switch and Band Decoder (BD RELAY BOARD option), to protect your decoder from adverse effects, such as RFI, surges etc. Remember, that the best protection is a galvanic isolation with a high isolation voltage.

Example of configuration with external switch :

List of antennas :
160m – dipole
80m – delta loop
80m – inv Vee
40m – HB9CV
20, 15, 10m – threebander
30, 17, 12m – threebander WARC

Assign ports to the antennas :

Band	***Antenna***	***Port***
160	dipole	1
80	Delta loop	2
80	Inv Vee	3
40	HB9CV	4
20, 15, 10	threebander	5
30, 17, 12	threebander WARC	6

Table. 3

Use manual switches for each half (each radio separately – see Fig.4), or use two micro Band Decoders for switching, both configured identically, to automatically switch antennas to match the transceiver frequency, excluding any error.

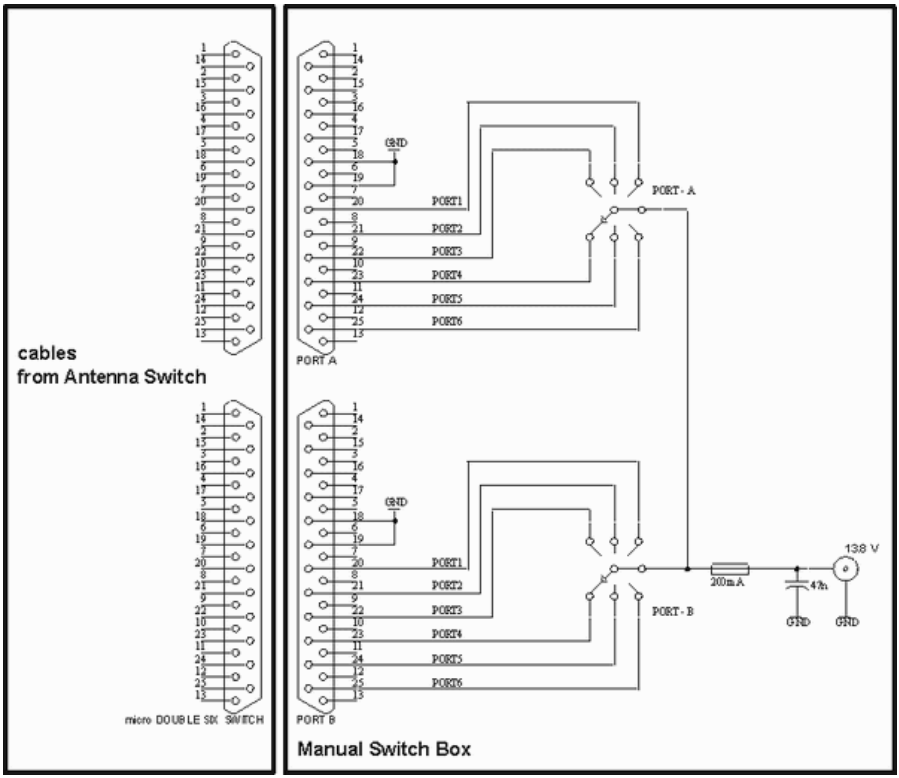
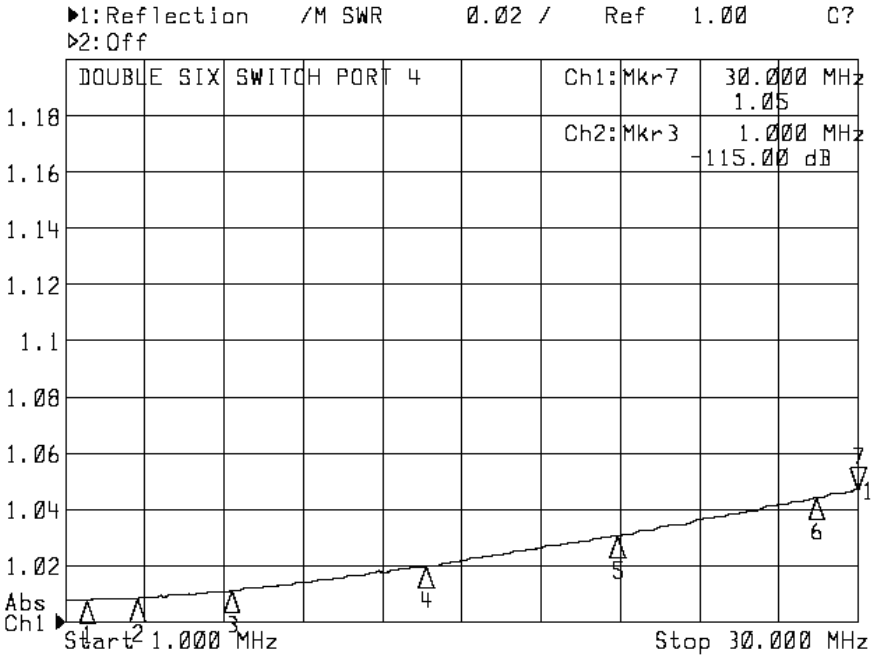

cables
from Antenna Switch
micro DOUBLE SIX SWITCH
PORT A
PORT B
GND
PORT1
PORT2
PORT3
PORT4
PORT5
PORT6
PORT - A
PORT - B
200mA
47n
138 V
GND
GND
Manual Switch Box

Fig.4

10. Results of measurements

On the following figures, results of measurements on several ports are displayed. More detailed results for all ports are available on our web site www.microham.com

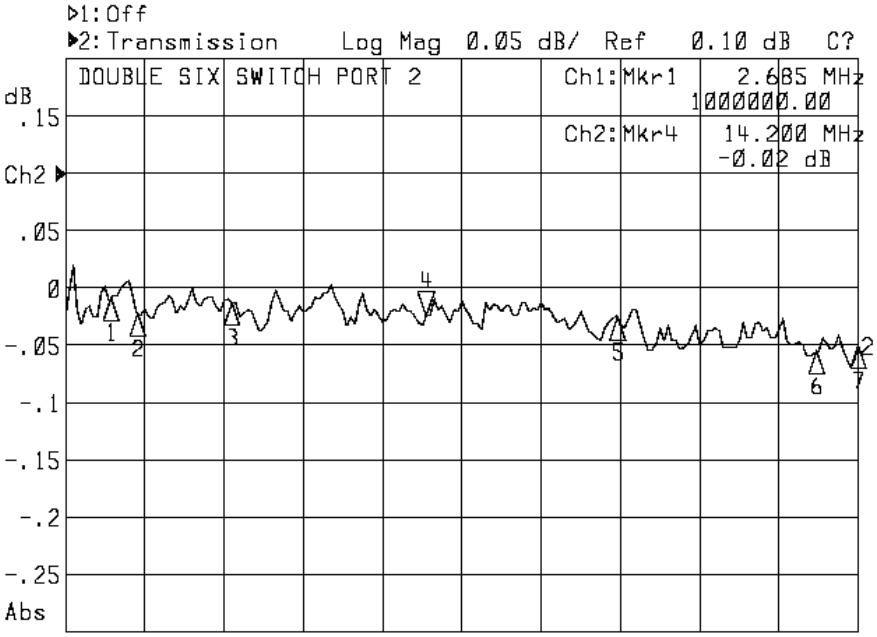
SWR : (A to PORT 4)



1:Mkr (MHz)		2:Mkr (MHz) dB
1:	1.80	1.01
2:	3.65	1.01
3:	7.10	1.01
4:	14.20	1.02
5:	21.20	1.03
6:	28.50	1.04
7›	30.00	1.05

Fig. 5

Insertion loss : (A to PORT 2)



Start 1.000 MHz Stop 30.000 MHz

1: Mkr (MHz)	2: Mkr (MHz)	dB
	1: 2.68	-0.01
	2: 3.65	-0.02
	3: 7.10	-0.01
	4› 14.20	-0.02
	5: 21.20	-0.03
	6: 28.50	-0.05
	7: 30.00	-0.05

Fig. 6

Isolation : (A to PORT 3, B to PORT 5)

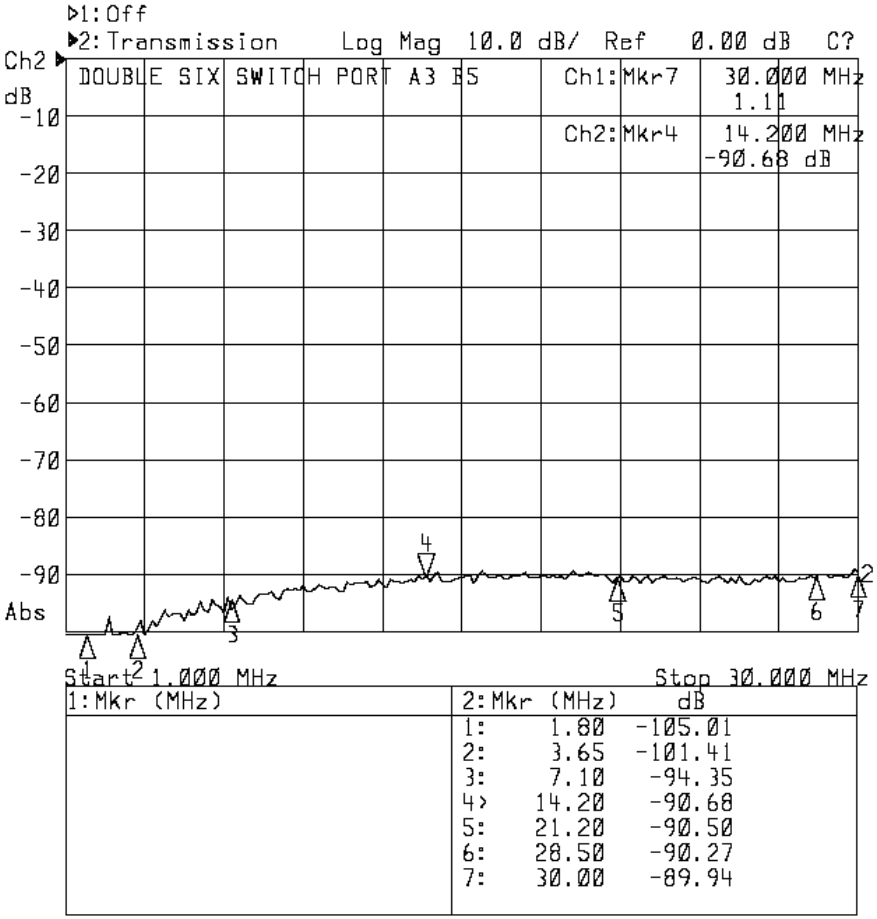


Fig. 7

SWR is measured from input to any antenna port.
Isolation is measured between A against B port selected to any antenna ports terminated by 50 ohms.

11. Notes

Final Inspection : S/N # .....

PORT	*1*	*2*	*3*	*4*	*5*	*6*
30 MHz SWR A						
30 MHz SWR B						

AEA® CIA-HF check-out

Under power check-out .....

Date .....