



## **Vertical Pointing Complete**

### **Micro-Rain-RADAR**

### **(MRR-2, FM-CW Mode)**

### **Information Pack**

**(IPMMRRUK0506.00)**





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## 1 Vertical Pointing Complete Micro-Rain-RADAR MRR-2, FM-CW Mode

### 1.1 RADAR Front End

Frequency:	24.1 GHz (24.1GHz - 24.15GHz)
Modulation:	saw tooth type, modulation depends on adjusted height resolution: for example 1.5 MHz for 100 m height steps for example 3 MHz for 50 m height steps
Radiated Power:	50 mW
Power Consumption:	25 W

### 1.2 Outdoor Components

- Offset parabolic dish antenna, Ø 60 cm, Beam width 2 °, 6 dB
- Radar front end (e-m feed), Ø 8 cm x 25 cm
- Transmitter control electronic, 26 cm x 16 cm x 10 cm, IP54
- Receiver unit and digital signal processor unit for FFT-analysis for derivation
- Doppler spectra (10 s sampling time)
- Data transmission with RS232 interface for system control,
- 25 m Junction cable for data transfer and power supply of outdoor components

### 1.3 Indoor Components

Power supply 220 VAC / 24 VDC / 25 W User can use either mains or 24 VDC as both are available.

## 2 Software

### 2.1 Control Software

Profiles of droplet spectra (i.e. drop size distribution), radar reflectivity, liquid water content and rain rate having regards to Mie-scattering, signal attenuation and density dependant fall velocity

System Parameter:

- Sampling time: 10 s \*
- Average time: adjustable,  $10s \leq t \leq 1800s$
- Number of height steps: adjustable, max.30
- Height steps: adjustable,  $10m \leq h \leq 200 m$
- Lowest measuring height: 2 height steps
- Automatic restart after power breakdown, no loss of settings
- Output of measured data (Spectra, reflectivity, rain rate, liquid water content) both as instantaneous and averaged data (with selected average interval)

Please note:

For the data transmission of the Doppler spectra from the outdoor receiver and FFT-electronic to the indoor data acquisition PC (see pos. 2) a transfer time of 2-3 s is required. Therefore, for a 10 s sampling time only 7-8 s are used for effective measurements.

### 2.2 Graphic-Software

- Software module for system access and control, data transfer and data storage
- Software module for on-line evaluation of Doppler spectra (measured data see above)
- Software module for graphic presentation of results and data:
  - profiles, time series, droplet spectra, statistics or 4- or 9- plot display in one graphic
  - selectable time and height ranges
  - smooth functions
  - printer output
  - export function to \*.tif, \*.eps, \*.wmf, bmp, txt, etc..

The MRR unit requires a PC computer unit for the data acquisition and the derivation of the precipitation parameters.

Biral will provide a quotation for a desktop / notebook, software installation, system calibration and configuration as well as test of components at Biral for complete functionality. If MRR unit is supplied without a PC you are responsible for this.

### Recommend minimum specifications for the computer unit:

For desktop models:

WINDOWS 2000 or XP;

600 MHz, Pentium III, 64 MB, 17" VGA Monitor, 20.0 GB HD, CD-Writer, 1.44 Floppy, 1 serial, 1 parallel port;

For notebook models:

WINDOWS 2000 or XP;

600 MHz, Pentium III, 64 MB, 14,1 TFT VGA Monitor, 8,0 GB HD, ext. CD-Writer, 1.44 Floppy, 1 serial, 1 parallel port; 2 PC-Card slots, Li-Ion Accu

### **3 Heating of the parabolic antenna dish (option. 2)**

Provides strong heating of antenna dish to ensure error free operation during snow and icing conditions. AC / DC converter 230 VAC / 110 VDC / 500 Watt, 25 m cable, heating elements on reverse side of antenna;

### **4 Device server RS232/RS422 to 10/100Mbps (option. 3)**

The basic MRR unit provides its data with the RS232 serial data standard. With the device server it is possible to connect the MRR data output with the network port of the data acquisition system. This opens the possibility to connect the data stream also to existing local networks for the data transfer on site.

Please kindly note that RS232 to USB adapter often cannot provide sufficient performance for the data conversion. Thus we recommend the conversion to Ethernet standard.

Connector:	DSUB 9 female, RJ45
Protocols:	TCP/IP, UDP, Telnet, DHCP, ICMP, HTTP, SNMP, DNS
Power:	9 to 30 VDC, 200mA @ 12V
Dimensions:	73 x 121 x 27 mm
Operating Temperature:	0°C to 60°C
Weight:	0,2 kg

### **5 Training**

Various training packages are available to suit your requirements. Please contact Biral for further details.

### **6 Installation**

The MRR will be delivered with an adjustable mounting adapter, which is suitable for a cylindrical mast with a maximum outer diameter of 48 mm. This diameter is common to scaffolding tubing. The mast has to be installed absolutely vertical with a maximum of one degree of tolerance. The mast is not included in the delivery.

## **7 Support and Spare Parts**

The MRR is of a high quality and built to have an extremely long life.

Biral and Metek have a policy to maintain a stock of replaceable items for 5 years from the date that manufacture ceases and there are no plans to cease manufacture in the foreseeable future. However if we do cease manufacture we could inform you at that time to discuss your requirements for replaceable parts / spares thus ensuring continuity of service.

Biral always offers free support by telephone, email or fax for the lifetime of our sensors regardless of the owner.

## **8 Warranty**

The Vertical Pointing Complete Micro-Rain-RADAR MRR-2, FM-CW Mode comes with 1 year parts and labour warranty as standard. For extended warranty please contact Biral for a quotation.

## **9 Notes**

The customer / end user is liable for the acquisition of the frequency permission and the operation of the MRR system.