R4-DCF
DCF antenna for master clocks of series HU

+ The R4-DCF radio time synchronisation receiver enables the time synchronisation of series 400 clocks & calendar clocks, series 47x time zone clocks and series HUx4850/4860 master clocks to accurate DCF radio time code signals.
+ DCF transmits on 77.5 kHz from Mainflingen, near Frankfurt/Main in Germany with signals derived from the Physikalisch-Technische Bundesanstalt, Lab. Zeiteinheit.
+ In theory the signals are receivable at a range in excess of 1000 km from the transmitter, subject to the effect of a wide range of variables such as time of day, atmospheric conditions and the degree of screening between the transmitter and receiver. In practice increasing levels of noise pollution, particularly from mobile radio systems, result in a reduction of reception reliability and we now recommend GPS time synchronisation for time and reliability critical applications.
+ The R4-DCF receiver is a high performance unit with dual crystal filters and dual ferrite antennas to provide omni-directional capability.

Technical specifications:

Connection cable:	The R4-DCF radio receiver is supplied with a 5 m long unscreened cable as standard. The cable length may be extended to 10 m using unscreened cable, RS 367-943 - 22 AWG or equivalent. In areas of high electrical noise a screened twisted pair should be used. The cable screen should be grounded at the HUx4860 end only.
Maximum cable length:	Cable length may be extended to 200 m using a screened twisted pair cable, RS 368-340 - 22 AWG or equivalent. (UL style 2092, Alpha 2401)
Dimensions (WxHxD):	160 x 80 x 55 mm
Housing:	The unit is housed in robust plastic case suitable for protected external mounting.
Protection class:	IP65
Ambient temperature:	-20 °C bis +50 °C

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How radio time synchronisation works

The DCF carrier is interrupted every second to encode time and date information with a full time, date and status message being transmitted every minute. The length of the individual carrier breaks determine the value of the coded information and the time of transmission within each minute determines the identity of each bit.
In addition to basic time and date information a 'second level' data set is transmitted during the last few seconds of each minute to provide warning of impending seasonal time changes, summer/winter time status together with parity bits which are used as part of the validation process for each message. At the start of each minute a unique bit pattern is transmitted called the 'minute identifier'.
Due to the possibility of transient interference or reception conditions causing corruption of the transmitted code signal or a total signal loss, the clock or master clocks use the DCF transmission as an update reference comparison rather than a continuous source of time information.

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