Daten-Verteiler HH-01

Encoder 1   RS 422   Encoder 2

ANTENNENRICHTUNG

H=191.2α
V= 28.8α

HH-03G
by DF1SR

STATIONDISPLAY

C2
GND
OUT   IN

Encoder-2
8
7
6
5
4
3
2
1
J1

5V

J4
1
2
3
4
5
6
7
8

12V   C3
IN   OUT
GND
IC1   5V   C2

LCD-2x16

14   1

Encoder-1
8
7
6
5
4
3
2
1
J2

CS-1

CS-2

8
7
6
5
4
3
2
1
J3

8   7   13   12   11   6   5   4   3

+5V

R7
H
23

ATMEGA48

24   R8
V

SN75179

3   7

2   5

8

6

R9

SN75179

6   2

5

8

7   3

R10

16   17   18   19   25   26   27   28

+   +   +   +

H   V

1-+5V   4-GND

1-+5V   4-GND

HH-01

HH-03

Operating instructions for digital rotor indicator

Introduction:
The equipment was developed for displaying exact directions of antennas.
In the usual rotors potentiometers or variable resistors are used, which
have a linearity error. Therefore often the beam direction is inaccurate.
When using antennas with high gain and small opening angle, it is a problem get
the correct direction. Digital encoders are used in this system, with smal
linearity error of under 0,5 degrees. It is a childern's game now, to get the
right antenna direction accurate to a degree.
The hobbyist can replace the original potentiometer in the antenna rotator with
the digital encoder. Note please that it only works when 360 degree
potentiometers has been used. The adjustment of the display happens later
simply by software on the display unit.

Start-up:
Connect one or both encoders at display unit or remote box. If necessary attach
cable connections between display unit and remote box. Attach voltage supply.
The display is lighted now. The datas are changing when the encoders are
rotating.

Adjusting of the zero point:
Beam your antenna to a beacon. Check the right direction with a QTH-Locator
program or a map. (This method has the advantage that a eventually squint of
the antenna can be compensated). Adjust the direction on the display with the
buttons at backround of your display or in the battery case.
(horizontal: H + or -, vertical: V or -).
Other method: beam your antenna to north. Set the display to zero.
After 30 seconds without changing the direction the display unit stores
automatically the new zero point. If the encoders or the connection to the
remote unit has been removed, the adjusted zero point is indicated.
The valus remain also after removing voltage supply.
Hint: Note the values. You can change the zero point without connected encoders.

Changing the direction of rotation:
If the encoders are driven over gear wheels, the direction of rotation could
run the wrong way around. No problem. Remove zero ohm resistors an circuit
board.
Resistance H stands for horizontal or resistor V for vertical.

Technical information:
Lighted display for up to 2 antenna rotators (e.g. horizontal and vertical).
Digital encoders with 360 degrees display range and no limit. Easy zero point
compensation of the antenna system freely adjustable on display unit.
Indicator direction (hand or counter-clockwise direction) free selectable on
circuit board. (Adjusted on delivery to clockwise direction).
Cable length between display unit and encoders some meters, with optional
remote box expandable on several 100 m. Cable between display unit and
remote box: Network cable crossed. Ready-made cables from the computer shop
can be used (STP - Patch - cable).

HH-01:   Remote box for longer cables
HH-02:   Display unit for portable use, 12V/80 mA, direct connection of encoders
HH-03:   Display unit , 12V/250 mA, with connection over remote box
HH-03G: Large display unit, 12V/350 mA, with connection over remote box
HH-05:   Digital encoders with 360 degrees display range and no limit

Applications:
Portable use with mast or tripod
Home use in antenna rotators
Wind direction for weather reporting
Bearing of a direction

# Antennenrichtungsanzeige für Azimut und Elevation

Ausführung für stationären Betrieb

Die Antennenrichtungsanzeige HH-03 ist geeignet für die Anzeige der Winkel für Azimut und Elevation mittels 10 bit-Encoder HH-05 für Antennenanlagen im VHF-, UHF- sowie SHF-Bbereich. Konzipiert wurde sie für weite Entfernungen zwischen Anzeige und Antennenstandort. Dazu kommt der Daten-Verteiler HH-01 (Schnittstelle RS422) zum Einsatz. (1 Stück 8-poliges Datenkabel RJ 45). Die Winkelauflösung beträgt 0,35 Grad. Die Kalibrierung der Winkel ist seitlich im Gehäuse des HH-03 durch „+" und „–" Tasten möglich.
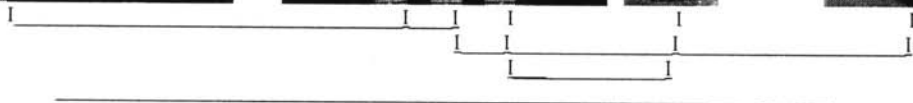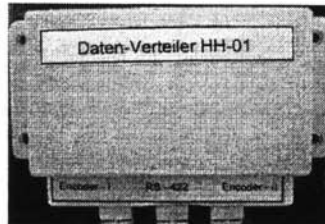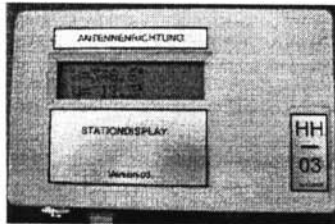
Ausführung 1

Ausführung 2
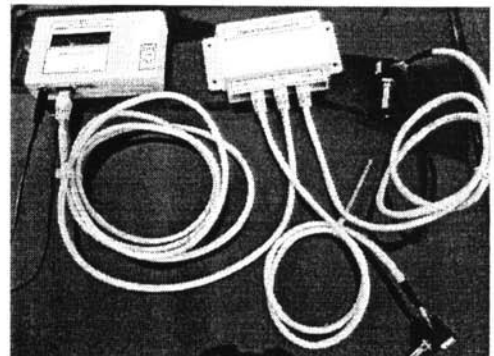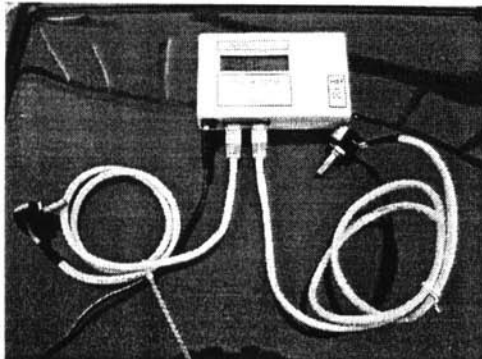
10 Bit 360° ABSOLUTE ROTARY ENCODER

Features:

Low cost
Miniature size
360° contactless rotational absolute position encoding
10 bit - 0.35° absolute resolution
Synchronous serial interface
Operating temperature range : -40°C to +125°C

Operating Conditions:

Supply voltage VDD = $4,5 < VDD < 5,5$ V
Supply current   < 20 mA

DC Characteristic for Digital Inputs and Outputs:

CMOS Schmidt-Trigger Inputs CLK,CS:
High level input voltage Min = $0,7 * VDD$
Low level input voltage Max = $0,3 * VDD$
Schmitt –Trigger hysteresis Min = 1V

Tri State Output DATA:
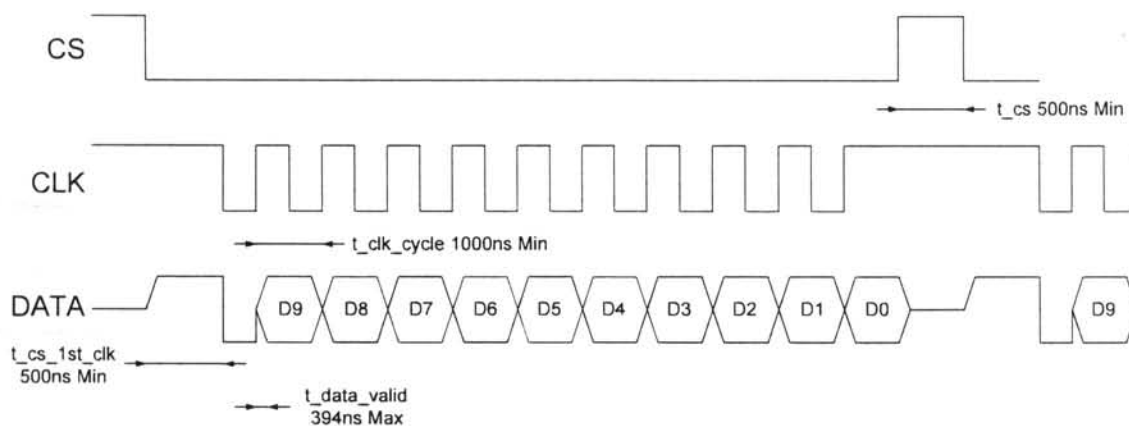High level output voltage Min = VDD – 0,5 V
Low level output voltage Max = 0,4 V
Output current IO Max = 4mA

Mechanical Drawings:
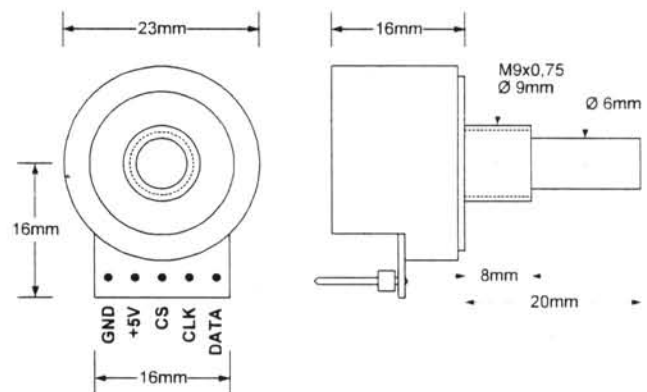
Synchronous serial interface (SSI), Timing Diagramm:

t_cs_1st _clk : Time between falling edge of CSn and first falling edge of CLK = 500ns Min
t_data_valid : Time beetwen rising edge of CLK and DATA valid = 394ns Max
t_cs : Pulse width of CS to initiate read-out of next angular position = 500ns Min
t_clk_cycle : Cycle Time of CLK to read out serial DATA = 1000ns Min (0 > fCLK < 1MHz)

Georg Hylinski
Karlstr. 6 · D-71034 Böblingen
E-Mail: DF1SR@arcor.de
Tel.: 07031/659749 · Fax: 07031/655149

DF1SR

ex. DD0SB

Confirming QSO with	Date (Z)	UTC	Freq / 2Meter	Pse Rept	Report

TX. Tmx QSL Pse