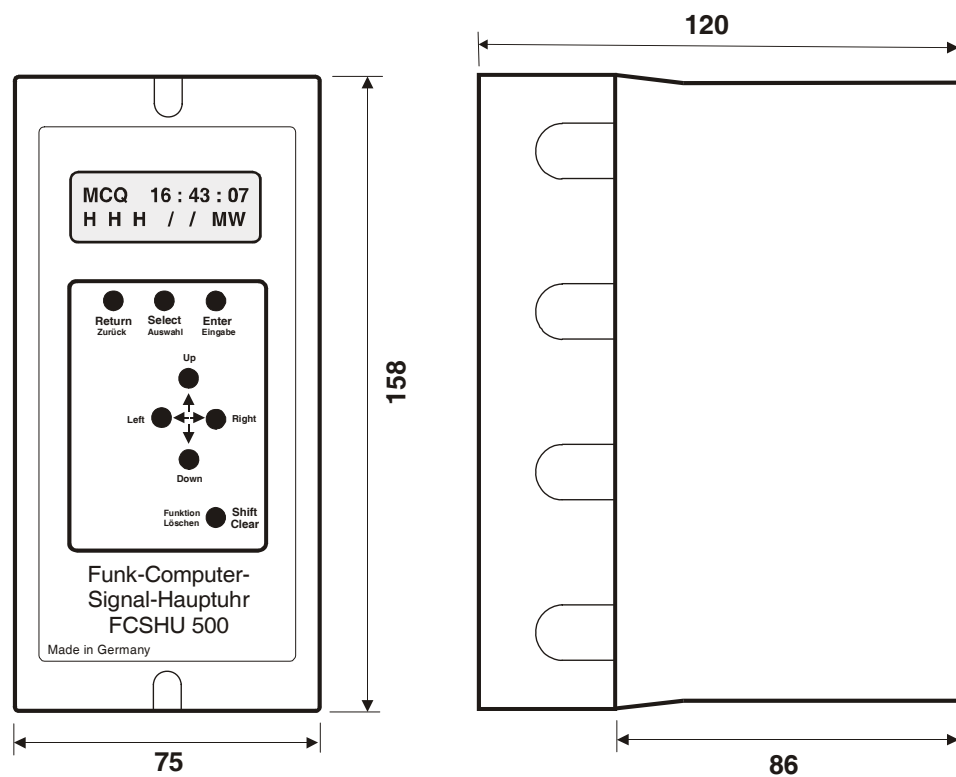


CSHU-500

Master Clock - Program Unit

Quick Start Guide



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NIS K-CSHU500 TELNU Master Clock

Time, Date & Daylight Saving Setting

A. INITIAL SCREEN:

After connection to mains the master initializes. Then following display appears:

First line: 'MCQ 12 : 47 : 36' Master Clock Quartz - time of day

Second line: 'H H H / / D'

The first three letters indicate the status of the 3x slave outputs:

H = Stop (Halt)

A = Automatic - line is operating

- = Inactive line (line not in use)

The forward slashes indicate the status of the two relay outputs:

/ = Relay contacts 'off'

| = Relay contacts 'on'

The last group indicates the configuration of the slave clock output:

D = DCF Time Code output

MW = Minute impulse output with daylight saving changes

mW = Half Minute impulse with daylight saving changes

SW = Second impulse output with daylight saving changes

B. TIME & DATE SETTING

(Time and date setting is not possible, if the master clock is synchronised to a primary time source, e.g. GPS receiver or another master controller. In sub-master mode time and date are automatically set.)

All three output lines must be turned 'off' = 'H', before time and date setting can be entered.

(If the keyboard is locked, enter the unlock key '9071' to unlock the keyboard.)

1. Push the '**select**' key and then the '**down**' arrow key 5x times until '**Set clock**' is visible.
2. Press the '**Enter**' key. The **time** and **date** appears in the display.
3. Ring the Telstra talking clock and obtain the correct local time.
4. Press the '**Enter**' key again to enter time setting. The cursor underlines the hours. With the '**up**' and '**down**' keys you can now change the value in 24h format.
5. Press the '**right**' arrow key to move to the minutes. Select a value one minute ahead of the current time. The seconds are set automatically to '00'. Then press the '**right**' hand key again to move to the date. Set the day, month and year (the weekday is set automatically)
6. Ring the Telstra talking clock (Ph: 1194) on your office or mobile phone.
7. Wait for the Telstra time to catch up with your programmed time and press the "**Enter**" button with the third beep.

C. START or STOP OUTPUTS 1, 2 or 3

1. With the right or left hand arrow keys select one of the three outputs on the bottom left hand side of the display. A cursor underlines the selected output.
2. Now push and hold the '**shift**' key and push the '**up**' arrow key to turn the output on and the '**down**' arrow key to turn the output off. Shift + Up = Output on Shift + Down = Output off

MCQ 12:47:36 <u>A</u> H H / / D	Initial Screen
---	----------------

Please note:

The output lines must be turned off before time setting, daylight saving dates and system parameter programming.

D. CHECK OUTPUT CONDITION

1. With the right and left hand arrow keys line up the cursor with the output line you like to check.
2. Press '**Enter**'. The display will show the master clock and output time:

MC 12:47:36 L2 12:47:36	Master Clock time	Line 2 time
--------------------------------------	--------------------------	--------------------

A (-) after L2 (or L1, L3) would indicate the line is behind local time and would therefore be in catch-up mode. The line time would also be on a different time from the master clock time.

A (+) after L2 (or L1, L3) would indicate the line is ahead of local time and would therefore wait until the local time catches up with the line.

3. Press the '**up**' arrow key to see the output date:

MC 11.10.03 L2 11.10.03	Master Clock date	Line 2 date
--------------------------------------	--------------------------	--------------------

D. CHECK OUTPUT CONDITION, continued

- Press the 'up' arrow key to see the line time and date. This menu allows for manual output line corrections by pushing or holding the 'Select' key.

STP	18:00:00	STP Line 2 time	Line 2 date
L2	11.10.03		

- Press the 'up' arrow key to see the output current draw in %:

C	V00%	D00%	C	Current parameters in %	Line 2 Mode - Status - Actual Current
L2	MW	H	C02%		

V = Pre-set current in %, **D** = current tolerance in %

It is not essential to program the current parameters. If parameters are required to be programmed for line monitoring purpose, set 'D' = 10% and 'V' = L1 100%, L2 + L3 inactive or L1 + L2 + L3 each 30% or L1 + L2 each 50%, Line 3 inactive.

Maximum output current handling:

Internal power supply: 400mA in total for all three output lines together

External power supply: 500mA per output line, total 1500mA

- Press 'Return' to return to the initial screen.

E. SET OUTPUT PARAMETERS

(Output lines must first be turned off.)

All three output lines must be turned 'off' = 'H' (halt), before the lines can be re-configured.

(If the keyboard is locked, enter the unlock key '9071' to unlock the keyboard.)

- Push the 'select' key and then the 'down' arrow key 4x times until 'Config. Line' is displayed.
- Press the 'Enter' key. The 'L1' configuration appears in the display. Press the 'up' arrow key to select L2 or L3.
- Press the 'Enter' key and the cursor jumps to the line mode.
- With the 'up' and 'down' arrow keys select the required line output mode. Then press 'Enter' to confirm.
- Press the 'Return' key twice to return to the initial screen.

Pulse Type	Pulse Length	Daylight saving change-over	Menu Code	Correction
Seconds Clock N	0.5 - 1 sec	No	SN	hours/min/sec
Half Minute N	0.5 - 7.5 sec	No	mN	hours/half-min
Minute N	0.5 - 7.5 sec	No	MN	hours/min
Seconds Clock W	0.5 - 1 sec	With	SW	hours/min/sec
Half Minute W	0.5 - 7.5 sec	With	mW	hours/half-min
Minute W	0.5 - 7.5 sec	With	MW	hours/min
DCF	100/200ms	With	D	hours/min/sec
Seconds Line	0.5 - 1 sec	No	s	seconds only
Inactive	-	-	I	-

F. SET/SYNCHRONISE SLAVE CLOCKS

(First turn off the output line with the 'Shift' and 'Down' keys.)

- Press the 'Select' key once. Then 3x the 'Down' key until 'Set line' appears in the display.
- Press the 'Enter' key. The Line 1 window appears.

L1	12:47:36	Line 1 setting window
MW	11.10.03	

- Press 'Enter' again to activate setting mode. The cursor lines up with the hours. Set the hours, minutes, day, month and year with the 'Left' or 'Right' and 'Up' or 'Down' push buttons. Set the time and date to the same time as indicated on the slave clocks. (Ensure that the slave clocks are all set to the same time and date.)
- Press 'Enter' to confirm and 2x 'Return'.
- Push and hold the 'Shift' key and then the 'Up' key to start the output line.

'DCF' output lines don't require setting.

'Seconds only' output lines require setting of the seconds only.

G. MAXIMUM TIME DIFFERENCE FOR AUTOMATIC CORRECTION

1. The automatic correction of the slave clocks is only possible within a maximum time difference between the line and the master clock time. The maximum permissible time difference depends on the line configuration as follows:

Impulse Type	max. permissible time difference
Seconds Clock N + Seconds Clock W	3 hours
Half Minute N + Half Minute W	3.5 days
Minute N + Minute W	7 days
DCF	-
Seconds Line	-

If the time difference is greater than the permissible range the correction has to be executed in several steps, e.g. a line time is entered within the specified range and after correction a new line time is entered until the line is within the required range.

H. DAYLIGHT SAVING SETTING

(The master clock is factory set to +1h on the last Sunday in October and -1h on the last Sunday in March.)

1. From the initial screen press the 'Select' key. Down arrow 6x times until 'Config. Clock' appears.
2. Press the "Enter" key and down arrow once. '-1h' and the date 01.01 appears. Press the 'down' arrow key and '+1h' and the date 01.01 appears.
3. Press the 'down' arrow key and 'ST/WT okt' appears. (The clock is set to automatically change to +1h on the last Sunday in October and to -1h on the last Sunday in March.)
To change the setting for other daylight saving options: Press 'Enter' and select the required option with the 'up' or 'down' arrow keys and confirm the change with 'Enter'.
4. Daylight saving options:
 - A. ST/WT okt = Australian daylight saving change-over time
 - B. ST/WT mar = European daylight saving change-over time
 - C. ST/WT radio = controlled by GPS receiver
 - D. ST/WT date = Date option for other countries. -1h and +1h to be set to the correct dates once every year
 - E. ST/WT date = No daylight saving. Set the dates for -1h and +1h in both cases to 01.01

CLEAR

1. Whenever a wrong entry has been made, or when an instruction/information screen is displayed, simply press the 'Shift/Clear' button briefly.

I. PROGRAMMING OF RELAYS K1 + K2

The program section of the master clock caters for two independent relay programs. Relays can be operated manually or automatically. The relays can be programmed for 'on' or 'off' events, like lighting, or 'impulse' events with a maximum relay closure of 99sec., like bells, hooters, etc. In automatic mode the program is divided into following sequences:

- A. Yearly
- B. Holiday
- C. Weekly
- D. Block

The master clock also provides for program back-up requiring the optional memory card.

J. SWITCHING OPTIONS

The initial screen provides visual indication of the relay contacts status as follows:

- / = Relay contact open
- I = Relay contact closed

Both relays provide a normally open contact and have been coded as follows:

- K1 = Contact pair 1
- K2 = Contact pair 2

Both output contacts can be programmed for 'on' or 'off' events and for on or off impulse events with an impulse duration of max. 99 seconds.

- C = on (closed)
- O = off (open)
- P = impulse of up to 99 sec

K. MANUAL RELAY ON/OFF

The relay contacts can manually be switched 'on' or 'off' at any time. With the 'Left' or 'Right' keys line up the cursor with relay 1 or 2. Select the required relay contact.

MCQ	12:47:36
H H H	<u>I</u> / MW

K1 turned on

Press and hold **'Shift'** and push the **'Up'** key to turn relay 1 **'on'**.
Press and hold **'Shift'** and push the **'Down'** key to turn the relay **'off'**.

L. CHECK + CHANGE TIME ENTRIES

Program times can be checked as follows:

Press the **'Select'** button once and with the **'Up'** key select the program to be checked. (Prog. Year, Prog. Holid., Prog. Week, Prog. Block and Date block)

Once the required program is displayed, e.g. **'Prog. Week'**, press **'Enter'**. The screen displays the first switching time. No entries have been made, if "No date" appears in the display. Push the **'Up'** or **'Down'** keys to scroll through all programmed switching times.

<u>W</u>	MDMTF- -
1P	
	08 : 15 : 00
05	

Weekly program set for Mon/Tue/Wed/Thu/Fri - impulse 5sec

Once the time entry, that needs changing, has been found, press **'Enter'** and change the underlined values with the **'Up'** and **'Down'** keys and move to the next group of values with the **'Left'** and **'Right'** keys. After the last value has been changed press the **'Enter'** key to confirm.

M. DELETE TIME ENTRIES

Search for the time entry that needs to be erased using the method described under paragraph **'L'** above.

Deletion of single entries: Push and hold **'Shift'** and press **'Return'**

Deletion of all entries: Push and hold **'Shift'** and press **'Enter'**

N. YEARLY OR HOLIDAY TIME ENTRIES

From the initial screen push the **'Select'** button once. **'Prog. year'** appears.

MCQ	12:47:36
Prog. year	

Select yearly with the **'Enter'** key or move to the holiday program by pushing the **'Up'** key once and then press **'Enter'**.

<u>J</u>	no
date	

'no date' means that no entries have been made, the program is empty.
Press the **'Select'** key to enter programming.

Y	<u>01</u> . JAN	1 P
	00 : 00 : 00	60

The highlighted values can now be changed with the **'Up'** and **'Down'** buttons. Select the next value with the **'Left'** or **'Right'** keys. Enter the required date, select relay 1 or 2, type of signal (open, closed or impulse), then move to the bottom row pressing the **'Right'** button and set the required time. If 'Impulse' mode was selected the value 60 for 60 second duration appears on the bottom right. The contact closure duration can be set from 1 to 99 seconds.

After all parameters have been programmed press the **'Enter'** key to confirm and terminate programming or press **'Select'** to continue with further program entries.

With the **'Clear + Enter'** keys the whole entry can be deleted.

O. WEEKLY TIME ENTRIES

From the initial screen push the **'Select'** button once. **'Prog. year'** appears. Now press the **'Up'** key 2x. **'Prog. Week'** appears.

O. WEEKLY TIME ENTRIES, continued

```
MCQ      12:47:36
Prog. week
```

Select 'prog. week' with the **'Enter'** key.

```
W   no
date
```

'no date' means that no entries have been made, the program is empty. Press the **'Select'** key to enter programming.

```
W M----- 1 P
   00 : 00 : 00  60
```

The highlighted values can now be changed with the 'Up' and 'Down' buttons. Select the next value with the 'Left' or 'Right' keys. All week days can be selected with the **'Shift + Up'** keys. Enter the required weekday (M=Monday, T=Tuesday, etc.), select relay 1 or 2, type of signal (open, closed or impulse), then move to the bottom row pressing the **'Right'** button and set the required time.

If 'Impulse' mode was selected the value 60 for 60 second duration appears on the bottom right. The contact closure duration can be set from 1 to 99 seconds.

After all parameters have been programmed press the **'Enter'** key to confirm and terminate programming or press **'Select'** to continue with further program entries.

With the **'Clear + Enter'** keys the whole entry can be deleted.

P. BLOCK PROGRAM ENTRIES

From the initial screen push the 'Select' button once. **'Prog. year'** appears. Now press the **'Up'** key 3x. **'Prog. Week'** appears. Blocks operate on a weekly cycle.

```
MCQ      12:47:36
Prog. block
```

Select 'prog. block' with the **'Enter'** key.

```
0   no
date
```

The first block '0' appears and 'no date' means that no entries have been made, the program is empty. With the **'Shift + Up'** keys select one of possible eight blocks (0 - 7).

Press the **'Select'** key to enter programming.

```
0 M----- 1 P
   00 : 00 : 00  60
```

The highlighted values can now be changed with the 'Up' and 'Down' buttons. Select the next value with the 'Left' or 'Right' keys. All week days can be selected with the **'Shift + Up'** keys. Enter the required weekday (M=Monday, T=Tuesday, etc.), select relay 1 or 2, type of signal (open, closed or impulse), then move to the bottom row pressing the **'Right'** button and set the required time. If **'P'** for impulse mode was selected the value 60 for 60 second duration appears on the bottom right. The contact closure duration can be set from 1 to 99 seconds.

After all parameters have been programmed press the **'Enter'** key to confirm and terminate programming or press **'Select'** to continue with further program entries.

With the **'Clear + Enter'** keys the whole entry can be deleted.

Q. BLOCK START/END DATES ENTRIES

From the initial screen push the 'Select' button once. 'Prog. year' appears. Now press the 'Up' key 4x. 'Date block' appears.

MCQ	12:47:36
Date block	

Select 'Date block' with the 'Enter' key.

0	block
	locked

The first block '0' appears and 'locked' means that this block is inactive. With the 'Up or Down' keys select one of possible eight blocks (0 - 7). Press the 'Enter' key to enter block start and end dates.

0	01. JAN
	02. JAN

With the 'Up or Down' keys set the start date. With the 'Right or Left' keys move to the end date entry. With the 'Up or Down' keys set the end date. Press 'Enter' to confirm the new entry. Press 'Return' 2x to return to the initial screen.

R. TERMINATION OF ENTRIES

Program entries can be terminated at any time during programming by pressing the 'Return' key.

S. LOAD PROGRAM FROM MEMORY-CARD

The master can be loaded with a program using the optional memory-card. Programs already in the master's memory will be erased during this process.

Slide the memory-card with the chip to the bottom left into the card slot.

MCQ	12:47:36
Prog. year	

From the initial screen push the 'Select' button once. 'Prog. year' appears. Now press the 'Up' key 5x. 'Load prog' appears.

MCQ	12:47:36
Load prog	

Select 'Load prog' with the 'Enter' key.

The master will be loaded with the program stored on the memory-card. All existing programs will be erased. After the program has been loaded the display returns to the 'Load prog' screen. If no card has been inserted the message 'No card' will appear. Clear the message with the 'Clear' button. Push the 'Return' key to return to the initial screen.

T. BACK-UP PROGRAM TO MEMORY-CARD

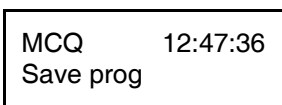
The master's relay program can be backed up using the optional memory-card. Programs already on the memory card will be erased during this process.

Slide the memory-card with the chip to the bottom left into the card slot.

MCQ	12:47:36
Prog. year	

T. BACK-UP PROGRAM TO MEMORY-CARD, continued

From the initial screen push the 'Select' button once. 'Prog. year' appears. Now press the 'Up' key 6x. 'Load prog' appears.



Select 'Save prog' with the 'Enter' key.

The memory card will be loaded with the master clock's program s. All existing programs on the memory card will be erased. After the program has been saved the display returns to the 'Save prog' screen.

If no card has been inserted the message 'No card' will appear. Clear the message with the 'Clear' button.

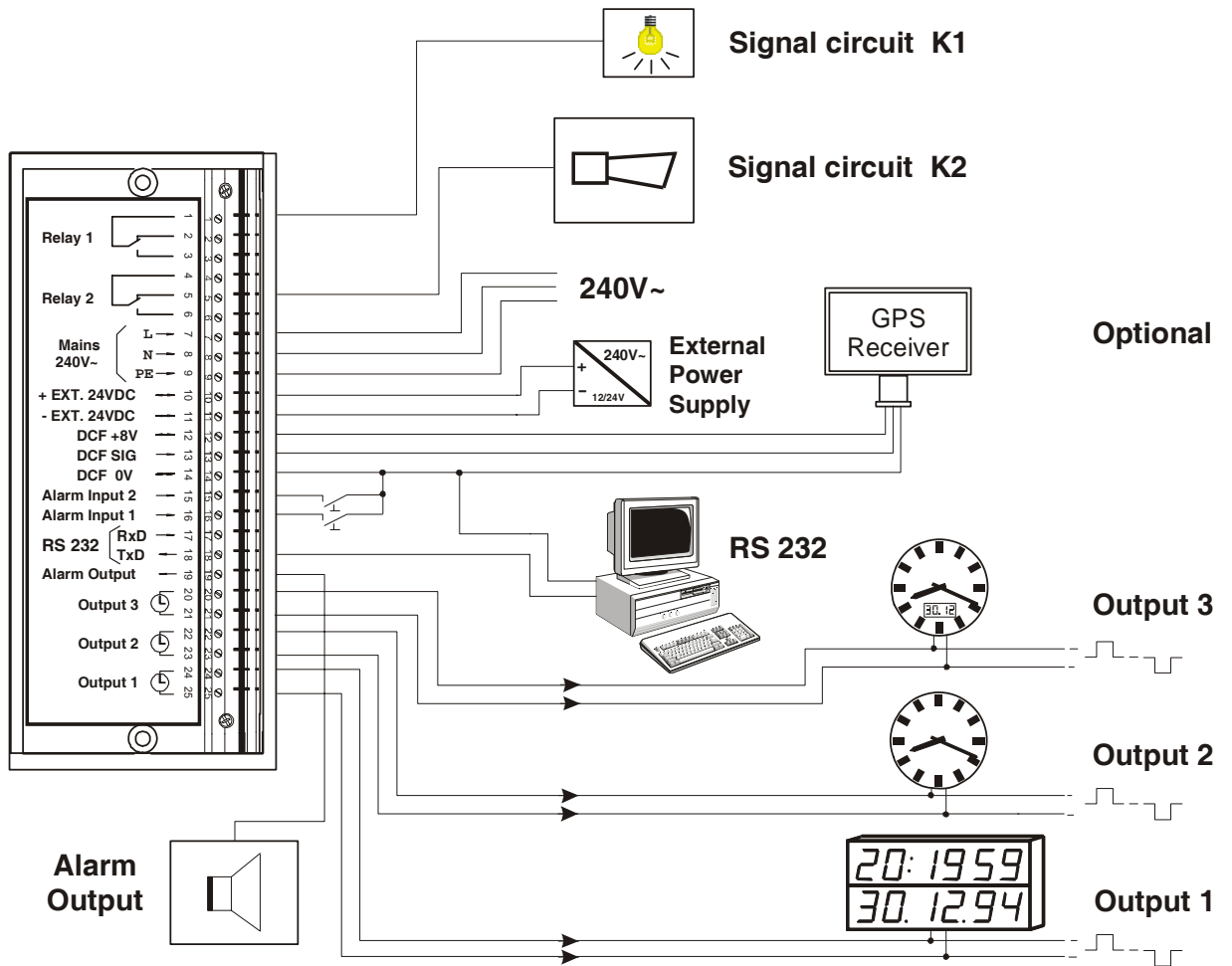
Push the 'Return' key to return to the initial screen.

U. TECHNICAL DATA

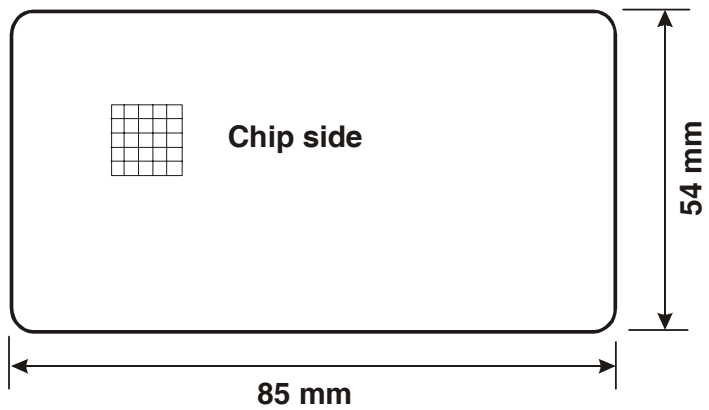
Impulse Current	Internal power supply: max. 400mA total for all three outputs (approx. 65x slave clocks) External power supply: max 500mA per output (total 1.5A approx. 250x slave clocks)
Impulse Type	each output is programmable for: minute, half minute, second impulse or Telnu DCF-77 time code
Impulse Duration	programmable 0.5 to 7.5 seconds
Connection of slave clocks	screw terminals in master clock base
Power Supply Power Consumption Current Consumption	240VAC +/-10%, 12VDC or 24VDC max. 15VA 12VDC = 600mA 24VDC = 600mA
Battery Back-up	approx. 10 years
Accuracy without GPS receiver	+/-5 x 10 ⁻⁶ at +17°C to +23°C = approx. 0.4 sec/day
Data Output	RS232: time, date, weekday Baud rate 4800
Remote Control for relay outputs	suitable for alarm, fire emergency or panic circuits
Alarm Output	open collector 30V 0.5A
Relay Contacts Rating K1 + K2	Turn-on current: 4A, continuous current handling: 3A, turn-off current: 2A. Relay contacts handling capacity: max. 60W (125VA). Switching voltage range: 0.1V - 250V
Program Options	On/Off or Impulse - Weekly, yearly, holiday and block programming
Program Resolution	1 second
Memory Capacity	325 switching times
Program Memory back-up	Back-up or transfer with optional memory card
External Synchronisation Options:	GPS Receiver (World wide) DCF Receiver (Europe only) Master Clock with DCF output
Operating Temperatures	0°C to +40°C at with internal power supply 0°C to +50°C at max. capacity with external power supply
Enclosure	Top: Impact resistant Polystyrol, light grey Base: Impact resistant Polystyrol, dark grey Mounting: surface or DIN-rail mounting Protection Rating: IP40
Dimensions	(W x H x D) 75 x 158 x 120mm (including base)
Weight	approx. 980 g
Order Numbers	CSHU-500-AU (stand alone operation with internal 240VAC 50Hz power supply) FCSHU-500-AU (GPS/DCF synchronised with internal 240VAC 50Hz power supply)

Note for technicians: Please provide spark suppression for relay contacts using provided components.

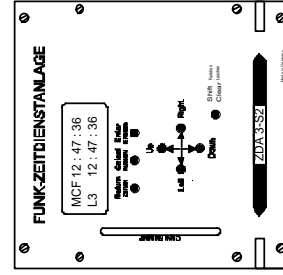
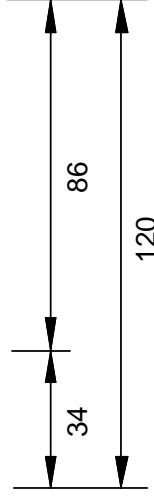
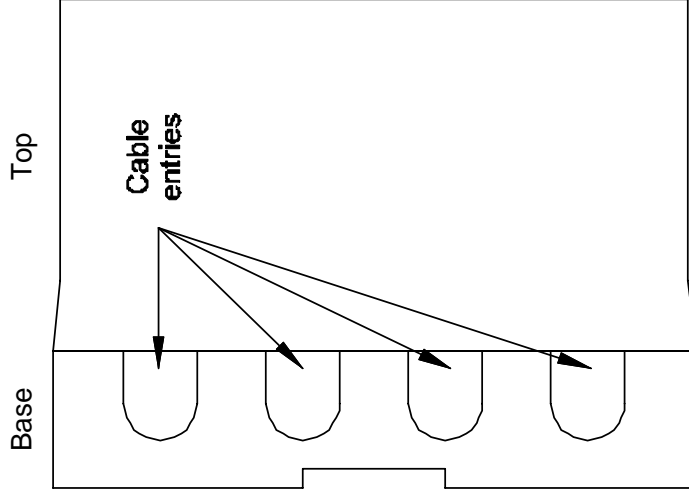
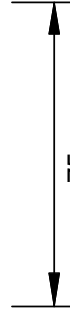
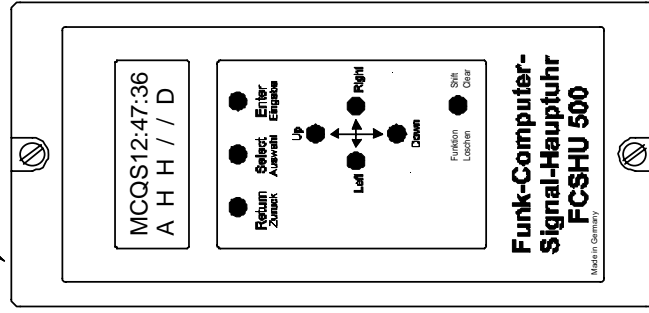
V. CONNECTION DIAGRAM



W. MEMORY CARD



Slot for Memory Card



Optional
Subrack
enclosure
ZDA 3-S2

K-CSHU-500

Computer Master Clock
with 2x programmable relays

Made in Germany

K-CSHU-500 Specifications

- Ten years battery back-up
- Automatic daylight saving
- 24VDC 400mA polereversing impulse output for up to 65x slave clocks or 13x Telnu clocks
- With external power supply up to 24V 1.5A capacity
- Slave clock output programmable for minute, half minute, second impulses and Telnu DCF-77
- Impulse length: 0.5 - 7.5 seconds duration
- Automatic setting/re-setting
- Automatic daylight saving change-over
- Line current monitoring
- Master or satellite operation
- Power Supply: 230/240VAC 50/60Hz 15VA Fuse: 200mA
- Dimensions: K-CSHU-500 HxWxD 158x75x120mm
- Weight: approx. 980 g

Relay Output Specifications

- 2x circuits, contact rating: 0.1V-250V 125VA (0.5A)
- 325x program settings
- Seconds resolution
- Impulse (e.g.: bells) and on/off switching (e.g.: lighting)
- Variable impulse length (1-99 sec)
- Weekly, yearly, holiday and block program
- Memory card for relay program back-up or transfer

Order Codes

- = K-CSHU-500 Computer-Signal-Master Clock
- = K-GRA24/0.5A Battery back-up in separate case
- = K-SK500 Memory Card
- = K-DISK-FCSHU Software (MS-DOS) for RS232
- = K-N240/DC24 External Power Supply 240VAC / 24VDC 1.5A
- = K-TELNU-BOOST-W Telnu Booster with 2x outputs 2.5A for up to 80x Telnu Clocks

Telnu... The fully hands-free self-correcting clock system!