



Mounting and instruction manual DCC – DCF Clock Controller DCC/30V DCC/48V

Please study these instructions carefully before installing the device.



Certification of the Producer

STANDARDS

The DCF Clock Controller (DCC) was developed and produced in accordance with the EU Guidelines:

2014 / 30 / EU EMC 2014 / 35 / EU LVD 2008 / 57 / EU Railway

CE

References to the Instruction Manual

- 1. The information in this Instruction Manual can be changed at any time without notice. The current version is available for download on www.mobatime.com.
- 2. This Instruction Manual has been composed with the utmost care, in order to explain all details in respect of the operation of the product. Should you, nevertheless, have questions or discover errors in this Manual, please contact us.
- 3. We do not answer for direct or indirect damages resulting from improper use of this manual.
- 4. Please read the instructions carefully and only start setting-up the product, after you have correctly understood all the information for the installation and operation.
- It is prohibited to reproduce, to store in a computer system or to transfer this publication in a way or another, even part of it. The copyright remains with all the rights with BÜRK MOBA-TIME GmbH, D-78026 VS-Schwenningen and MOSER-BAER AG – CH 3454 Sumiswald / SWITZERLAND.

Table of contents

1	S	Safety	4
	1.1	Symbols and Signal Words used in this Instruction Manual	4
	1.2	Intended Use	4
	1.3	Mounting instructions	4
	1.4	Electric connections	5
2	G	General information – introduction	6
	2.1	Scope of Delivery	6
	2.2	Function description	6
3	N	Mounting and commissioning	6
4	C	Configuration	7
5	C	Connections and displays	8
	5.1	DCC	8
	5.2	DCC/30V	9
	5.3	DCC/48V	10
	5.4	Time signal outputs	11
	5	5.4.1 MOBALine	11
	5	5.4.2 DCF active bipolar	11
6	C	Operating behavior	11
	6.1	Power supply	11
	6.2	Factory settings	11
7	N	Maintenance	12
	7.1	Troubleshooting: Repairs	12
	7.2	Cleaning	12
	7.3	Disposing	12
8	D	Dimensions	13
9	Т	Technical data	14

1 Safety

Read this chapter and the entire instruction manual carefully and follow all instructions listed. This is your assurance for dependable operations and a long life of the device.

Keep this instruction manual in a safe place to have it handy every time you need it.

1.1 Symbols and Signal Words used in this Instruction Manual



Please observe this safety message to avoid electrical shock!

There is danger to life!



Please observe this safety message to avoid bodily harm and injuries!



Please observe this safety message to avoid damages to property and devices!



Additional information for the use of the device.

1.2 Intended Use

The **DCF Clock Controller** is a device used to control and illuminate clocks.

In the following chapters, the designation **DCC** is used for better readability.

The **DCC** is to be installed on the inside of the clock housing. The on-site assembly, wiring and commissioning must be carried out by **qualified personnel** only. For this, the following information on mounting (chap. 1.3), wiring (chap. 1.4) and commissioning (chap. 3) must be considered.

1.3 Mounting instructions



- The **DCC** must be mounted on an even mounting plate inside the clock housing. For measurements, see chap. 8.
- The 2 mounting holes with copper lamination for the functional earth $\not\rightarrow$ must be electrically connected to the mounting plate (clock housing) using metal bolts. See chap. 5.
- The DCC must be mounted in a way to be protected against damage, dirt and water. The clock housing must be built for IP 54 or higher.
- If the **DCC** cannot be placed inside the clock housing, in exceptional cases it may be mounted in the immediate vicinity of the clock. In this case, the cable length for the movement and illumination must not exceed 1m. Moreover, the DCC must be protected against touch, dirt and water. Because of operational warming, sufficient air circulation must be provided.



Make sure to wait before using the device after any transport until the device has reached the ambient air temperature. Great fluctuations in temperature or humidity may lead to moisture within the device caused by condensation, which can cause a short.

1.4 Electric connections



The power supply connection to the clock must be installed by a state-licensed electrician. The national installation regulations must be followed.

A bright grey push terminal serving as cut-off point is used for mains connection. In the supply line provided by the customer, a fuse must be provided for both the movement and the illumination according to the power data. The power data is right next to the terminal.

The same phase (nom. 230 VAC) is to be used for the movement and the illumination power supply. A supply wire with a cross section of max. 2.5mm² is to be used. The phase and neutral conductor for the illumination and movement are to be affixed near the plug terminal using a cable strap for each. The connecting wires must be stripped by 9-10mm.

Mains power supply connection:



Supply 100 - 240 VAC ; 2 mA Illumination (gate input without load) Recommended fuse 315mA / fast-acting

Supply 100 - 240 VAC ; 0.55 A Movement and illumination Recommended fuse 3.15A / delay-action



The clock housing and the mounting plate for the DCC must be connected to the protective earth of the mains supply (PE).

Movement power supply 30VDC: when using a DCC/30V with OCD 4500



Power supply 30 VDC ; 0.1 A polarity independent

For the 30VDC movement power supply, a grey spring terminal (18, 19) is present. The connection wires must be stripped by 5 – 6mm. The 30VDC power supply from OCD 4500 is current-limited and short-circuit proof. The OCD 4500 contains a separator.

Movement power supply 48VAC: when using a DCC/48V



Power supply 48 VAC ; 50/60Hz ; 0.1 A polarity independent

For the 48VAC movement power supply, a grey spring terminal (18, 19) is present. The connection wires must be stripped by 5 - 6mm. In the supply line provided by the customer, a two-wire separator must be provided.

The 48VAC power supply must be fused according to power data. The power data is right next to the terminal.

2.1 Scope of Delivery

Please check your delivery for completeness and notify your supplier within 14 days upon receipt of the shipment, if it is incomplete.

The package you received contains:

- 1 pc. DCC DCF Clock Controller
- 1 pc. spring terminal 4-pole (for mains power supply)

2.2 Function description

The **DCC** is an interface between DCF/GPS receivers or MOBALine or DCF active master clocks and the SEM100t/SAM100t movements (DCF active / MOBALine movements). Furthermore, the **DCC** can control the clock illumination.

The **DCC** features configuration switches. Using these, the illumination level and control type can be set.

It is powered by 230VAC.

3 Mounting and commissioning

To mount the DCC and put it into service, the following steps can be taken:

- 1. Mount the **DCC** at the destination.
- 2. Configure it using the DIP switches
- 3. Connect MOBALine or DCF active movements to the line outputs
- 4. Connect the LED illumination to the illumination output
- 5. Connect the time signal to the corresponding input
- 6. Connect the power supply:
- DCC: 230VAC, connect permanent and illumination mains at the corresponding symbols (7-10)
- DCC/30V: Connect 30VDC to grey clamp (18, 19) and illumination mains to "clock symbol" clamp (9, 10)
- DCC/48V: Connect 48VAC to grey clamp (18, 19) and illumination mains to "clock symbol" clamp (9, 10)

4 Configuration

Configuration takes place over a quadruple DIP switch. With the first three switches, the illumination level can be adjusted.

current [mA]	1	2	3
240	OFF	OFF	OFF
350	OFF	OFF	ON
390	OFF	ON	OFF
440	ON	OFF	OFF
500	OFF	ON	ON
550	ON	OFF	ON
590	ON	ON	OFF
700	ON	ON	ON

With the fourth switch, the illumination control type can be selected.

Illumination control	4
230VAC switched	ON
Light always on	OFF

5.1 DCC



functional earth

No.	Group	Meaning and function		
1	Timo cignal input	Connection a	MORAL inc. or DCE active bipelar	
2	rime signal input	Connection b	NOBALINE OF DOF ACTIVE DIPOLA	
3	DCF input	DCF IN +	for connection a DCF or GPS receiver	
4	Current loop	DCF IN -	(MET time zone only)	
5	CPS nower supply	GPS power sup	oply + (30 VDC, 100 mA max.)	
6		GPS power supply -		
7	Power input for illumina-	Phase (180 – 240 VAC / 0.1 A)		
8	tion control	Neutral conductor		
9	Power input	Phase (180 – 2	240 VAC / 0.55 A)	
10	Fower input	Neutral conduc	tor	
11	Time signal - output 2	Connection b	MOBALine (with MOBALine input signal only) or	
12	Movement generates direct load for the clock line of the master clock.	Connection a	DCF active bipolar (with DCF active bipolar (1, 2 input signal only)	
13	Time signal - output 1	Connection b	MOBALine (with MOBALine input signal only) or	
14	Movement generates no load for the clock line of the master clock.	Connection a	DCF active bipolar (with DCF/ GPS current loop (3, 4) or DCF active (1, 2) input signal only)	
15	DIP switch for illumination	Illumination lev	el (1-3) see chapter 4 Configuration	
15	control	Illumination control (4) see chapter 4 Configuration		
16	Illumination output	- LED illumination		
17	indimination output	+ LED illumination		
Α	Signal LED (yellow)	Flashes with signal clocking (MOBALine: permanently ON,		
B	Power LED (green)	Elashas if voltage is applied to power input (pins 0 and 10)		
0	Power supply LED illumi	riasnes ii voitaye is applieu to power input (pilis 9 and 10)		
С	nation (red)	Flashes if volta	ge is applied to illum. control input (pins 7 and 8)	

5.2 DCC/30V

The DCC/30V is primarily used in conjunction with an OCD 4500.



unused connection

5.3 DCC/48V

The DCC/48V is intended for use with MOBALine only.



unused connection

5.4 Time signal outputs

The DCC features a time signal output which gives out either MOBALine or DCF active bipolar, depending on input signal.



Connections 11/12 or 13/14

11/12: Direct continuation of the input clamp 1/2 **13/14:** Decoupled and boosted output signal

5.4.1 MOBALine



MOBALine is only given out if MOBALine is connected to the input.

• Frequency-modulated MOBALine time signal for self-setting slave clocks. (MLU 190, SEM 40 / SAM 40, SAM 00, SEM 100(t) / SAM 100(t))

- Output format: local time
- Electrical properties: approx. 20V / 50Hz

5.4.2 DCF active bipolar

DCF active bipolar is given out if a DCF or GPS antenna with current loop output or a DCF active bipolar signal from a master clock is connected to the input.

- Polarity-switching second-by-second time signal for self-setting slave clocks. (SEM 100(t) / SAM 100(t))
- Electrical properties: approx. 20V

6 Operating behavior

6.1 **Power supply**

The **DCC** is generally powered by 230 VAC. It has a maximum consumption of 20 Watt, of which up to 18W are allotted to the LED illumination.

6.2 Factory settings

By default, DIP switches 1-3 are set to OFF, meaning the illumination level is set to minimum. Adjust the brightness of the LED illumination to the environmental lighting conditions after mounting the clock by increasing the brightness step-wise.

By default, DIP switch 4 is set to ON, meaning the illumination is controlled via the illumination control input. If no separate illumination mains is present, the clamp with the lamp symbol is not used; instead, the DIP switch 4 is set to "OFF" to permanently switch on the illumination.

7 Maintenance



For any kind of maintenance or wiring work, the clock is to be removed from the movement and illumination mains via separator.

7.1 Troubleshooting: Repairs

If you cannot rectify the problems, contact your supplier from whom you have purchased the device.

Any repairs must be carried out at the manufacturer's plant.

Disconnect the power supply immediately and contact your supplier, if ...

- liquid has entered your device
- the device does not properly work and you cannot rectify this problem yourself.

7.2 Cleaning

- Please make sure that the device remains clean especially in the area of the connections, the control elements, and the display elements.
- Do not use solvents, caustic, or gaseous cleaning substances.

7.3 Disposing



Device

At the end of its lifecycle, do not dispose of your device in the regular household rub-bish. Return your device to your supplier who will dispose of it correctly.



Packaging

Your device is packaged to protect it from damages during transport. Packaging is made of materials that can be disposed of in an environmentally friendly manner and properly recycled.

8 Dimensions

All measurements in mm



The contact points must be electrically connected to the mounting plate using metal bolts!

Mounting locations



 $\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{\textit{\ensuremath{m}}}}}}}}\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\textit{\ensuremath{m}}}\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{m}}\ensuremath{\ensur$

Mounting hole for M3 screw

9 Technical data

Synchronization	MOBALine, DCF active bipolar, DCF current loop			
Power supply	100 – 240 VAC, 0.55A, 50 / 60 Hz (max. 20 W)			
Start-up current	Cold start: 70A (t_{width} = 200 µS measured at 50% I_{peak}) (see safeguard table)			
	Circuit breakerB10B16C10C16Number of DCCs47711			
Loss of synchronization	See movement. DCC gives out DC voltage if no time signal is present.			
Time code outputs	Depending on input: MOBALine: local time, 20V / 50Hz / max. 100mA DCF active: local time, 20V / max. 100mA			
Illumination	30V / max. 700mA			
Control DIP switches	1-3 illumination level (current) 4 illumination control			
Displays (LEDs)	Green:power supply availableYellow:signal availableRed:illumination control, 230 VAC available			
Temperature range	-30 °C +70 °C			
Dimensions	mensions (L x W x H): 165 x 65 x 36 mm (without mains connector			
Weight	250 g			



HEADQUARTERS / PRODUCTION

MOSER-BAER AG Spitalstrasse 7, CH-3454 Sumiswald Tel. +41 34 432 46 46 / Fax +41 34 432 46 99 moserbaer@mobatime.com / www.mobatime.com

SALES SWITZERLAND

MOBATIME AG Stettbachstrasse 5, CH-8600 Dübendorf Tel. +41 44 802 75 75 / Fax +41 44 802 75 65 info-d@mobatime.ch / www.mobatime.ch

SALES GERMANY, AUSTRIA

BÜRK MOBATIME GmbH Postfach 3760, D-78026 VS-Schwenningen Steinkirchring 46, D-78056 VS-Schwenningen Tel. +49 7720 8535 0 / Fax +49 7720 8535 11 buerk@buerk-mobatime.de / www.buerk-mobatime.de

SALES WORLDWIDE

MOSER-BAER SA EXPORT DIVISION 19 ch. du Champ-des-Filles, CH-1228 Plan-les-Ouates Tel. +41 22 884 96 11 / Fax + 41 22 884 96 90 export@mobatime.com / www.mobatime.com

MOBATIME SA En Budron H 20, CH-1052 Le Mont-sur-Lausanne Tél. +41 21 654 33 50 / Fax +41 21 654 33 69 info-f@mobatime.ch / www.mobatime.ch

