CLOCKS

Master Clock 2
Master Clock Mark 1 TC **2**
Slave Clocks 8
Various clocks **8**
Slave Clocks 1610xx 8
Slave Clocks 1700xx 10
Flush Mounting - Slave Clocks SC 10/20 12
Type Diplomat/Commander 14
Indoor with LED-Illumination 16
Outdoor Clocks **17**
Single/Double Face 17
Single/Double Face, LED Illumination 19
Slave Clock for Galley, IP65 20
Digital Clocks **21**
LUMEX 5/7/12 21
Digital Panel Clock 23

Master Clock

Master Clock Mark 1 TC

Application:

- Management of UTC and LT time on board ships
- Operation of slave clocks
- Output signal for various purposes
- Back-up System

Management of time on board ships

The Master Clock Mark 1 TC from SMT is the ideal solution for management of both local time and UTC time on board ships. With many years of experience, our Master Clock Systems has proven very reliable and useroriented.

Main features

Track on LT and UTC time. Operation of up to 250 slave clocks. Serial communication to other systems. Output signal for various purposes. Programmable Relay outputs.

Operation of Master Clock

Master Clock Mark 1 TC is provided with a useroriented keyboard, used for adjustment of time, programming, test and lightdimming. The built-in display has 2 lines, indicating LT, UTC, date and year during normal operation.

Furthermore, the display provides guidance for the operator during programming and activation of function keys.

Back-up

Master Clock Mark 1 TC is provided with back-up for all functional setups. The UTC and LT time are not stopped during power off, but continues running in memory. When power returns, all slave clocks are adjusted to correct time and a serial time signal is transmitted to all external units connected (PC, Voyage Recorder, Alarm Systems, etc.)

Design

- Table mounting
- Flush mounting
- Rack mounting

Dimensions

- Length: 448 mm
- Height: 134 mm
- Depth: 195 mm
- Weight: 5,0 kg

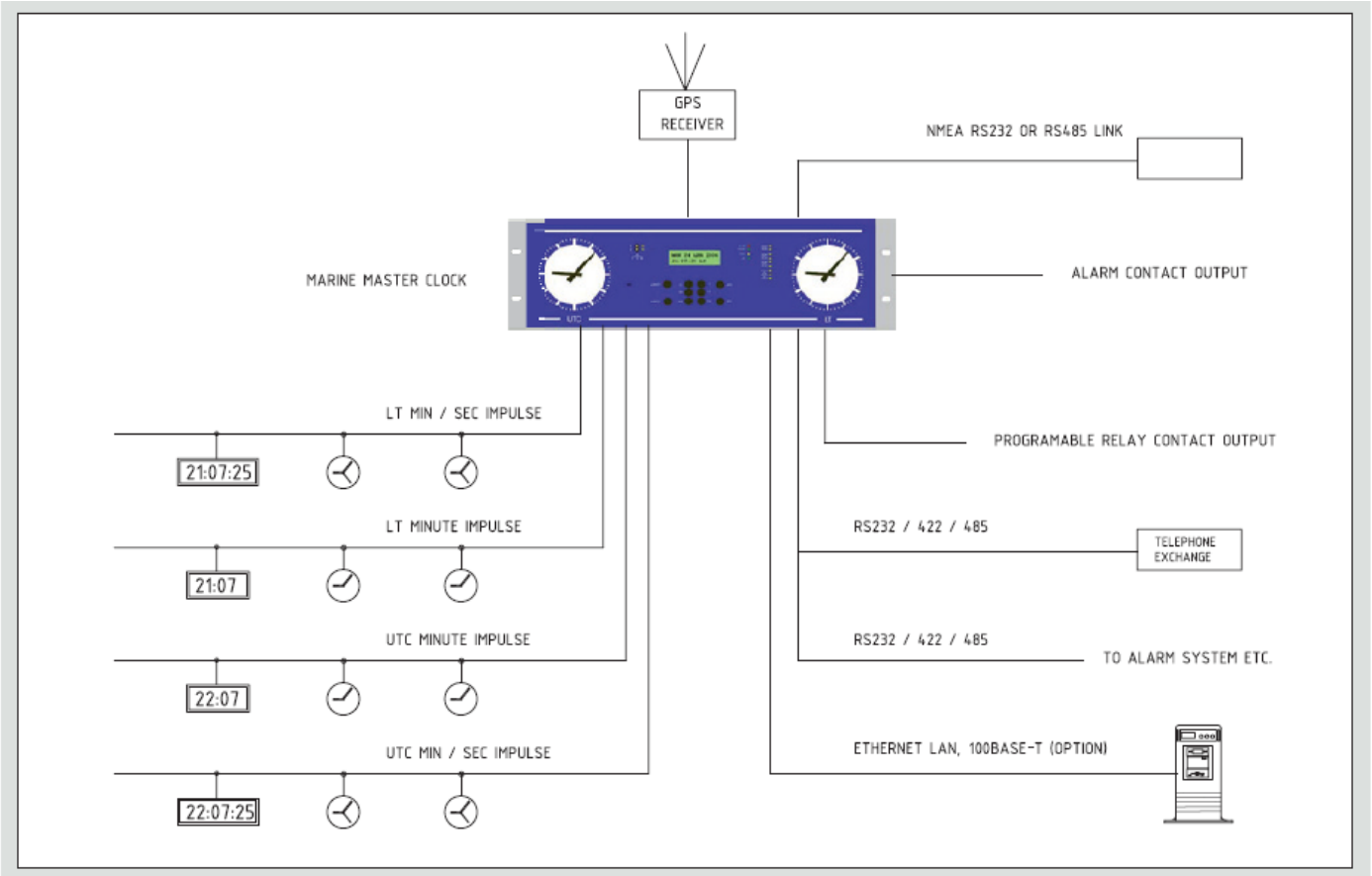
Input

- RS232 or RS485, NMEA0183 ZDA
- GPS
- Ethernet LAN (Option)

Output

- Polarized minute and second impulses for digital, analogue and intelligent self synchronizing slave clocks
- Serial RS232 and/or RS422/485 output I.e. to the ship's computer, Voyage Recorder, Telephone Exchange, etc.
- Programmable Relay outputs
- Power Failure Alarm Contact
- Ethernet LAN (Option)

Example of Electrical Connections



Technical specification

General

The master clock has 6 buttons and one (2 line x 16 character) LCD. To facilitate time zone change there are 2 separate buttons for this purpose. The master clock also has a dimmer to adjust background illumination.

Technical Data

Crystal frequency:	4,915200 MHz.
Accuracy:	0,1 sek./24 hours (+20C^0).
Microprocessor:	HD6412394
Time memory:	30 days (Back-up with Super Capacitor)
Ambient temperature:	0 ^{0}C to +50 ^{0}C.
Relative humidity:	Max. 85% non-condensing.
Case:	19” case according to drawing 085811-00
IP rating:	IP20
Weight:	5.0 kg.
CE-approval, EMC	Emission according to EN61000-6-3, Immunity according to EN61000-6-2

Outputs for slave movements *:

Control clocks:	Analogue display, with background illumination
Output 1:	
Impulse system:	1/1 minute, 1/2 minute, second, 1/2 second, time code (TC)
Type of time:	LT, UTC
Impulse length:	Minute 0.1-9.9 sec. Second 0.1-1 sec.
Output 2:	
Impulse system:	1/1 minute, 1/2 minute, second, 1/2 second, time code (TC)
Type of time:	LT, UTC
Impulse length:	Minute 0.1-9.9 sec Second 0.1-1 sec.
Output 3:	
Impulse system:	1/1 minute, 1/2 minute, second, 1/2 second, time code (TC)
Type of time:	LT, UTC
Impulse length:	Minute 0.1-9.9 sec Second 0.1-1 sec
Output 4:	
Impulse system:	2-wire, 1/1 minute, 1/2 minute, second, 1/2 second, time code (TC). 3-wire for forward forward/back. 1/1-minute alt. 1/2-minute.
Type of time:	LT, UTC
Impulse length:	Minute 0.1-9.9 sec. Second 0.1-1 sec.
Max. load / output:	2A
Total load all outputs together:	2.5A

The outputs have short circuit protection that is restored automatically.

*Analogue intelligent slave clocks connected to time code output receive the time code and steps to correct time by rapid impulses. The rapid impulses have a speed of approx. 10 steps /second. To step forward 11 hours takes approx. 1 minute and 10 seconds.

Relay outputs

Number of outputs:	2 Changeover potential-free contacts
Max load/relay output:	230 V 6A.
Program memory:	100 year (EEPROM).
Signal points:	800

Special pulse output
Relay output no. 2 can be dedicated to send out a special pulse.
When this function is enabled the relay is activated every day for 5 seconds at 02.00 UTC.

Telegraph Logger Clock signal
If one of the impulse outputs is configured to work as telegraph logger clock signal (1/2M-12B), then relay out- put no. 2 is used to send out a Counter C.W. signal and can not be used for other purposes.

Alarm output

Number of outputs:	2 Changeover potential-free contacts.
Type of alarms	
Output no. 1 (general alarm):	Overload / short circuit, synchronisation alarm
Output no. 2 (power alarm):	Power failure alarm

Serial ports

The Master Clock is equipped with two serial ports, one RS232 and one RS422/485. Both ports can be used either as input or output for serial time messages.
If programmed as output the port can be used to send out time to external equipment such as computers etc.
If programmed as input the port can be used to synchronise the master clock with an external time source pro- vided with RS232 or RS485 output. The purpose of this is to achieve higher accuracy.

Protocol, data format and baud rate is selectable for respective serial port.

Serial output

Baud rate (selectable):	300, 600, 1200, 2400, 4800, 9600, 19200 baud.
Data format (selectable)	7N1, 7N2, 7O1, 7O2, 7E1, 7E2, 8N1, 8N2, 8O1, 8O2, 8E1, 8E2
No. of data bits:	7 or 8
Type of parity:	None, odd or even
No. of stop bits:	1 or 2.
Available protocols:	- ZDA Time string, NMEA 0183 - Westerstrand protocol no. 2, 3, 5, 7 etc. (Automatic time message protocols)
Type of time (selectable):	UTC, LT

Serial input

Baud rate:	4800 baud
Data format:	8N1
Type of protocol:	ZDA Time string, NMEA 0183

Power supply

The master clock has two inputs for power supply, one for AC, and one for 24V DC. As standard the DC-input is a direct connected input without galvanic isolation and no compensation for low input voltage. With option DC/DC the DC-input will be galvanic isolated and low / high input voltage is compensated automatically.

Supply voltage:	90 - 264V 50/60 Hz and 24VDC.
Option DC/DC:	
(Galvanic isolated)	
Input voltage:	19 - 36VDC
Output voltage:	23 – 30VDC (adjustable)
Isolation voltage:	1500V
Power consumption	
AC:	65W
DC:	50W

Options
DC/DC -converter Ethernet LAN connection GPS-receiver
Table model
Software for time to computer, WINT

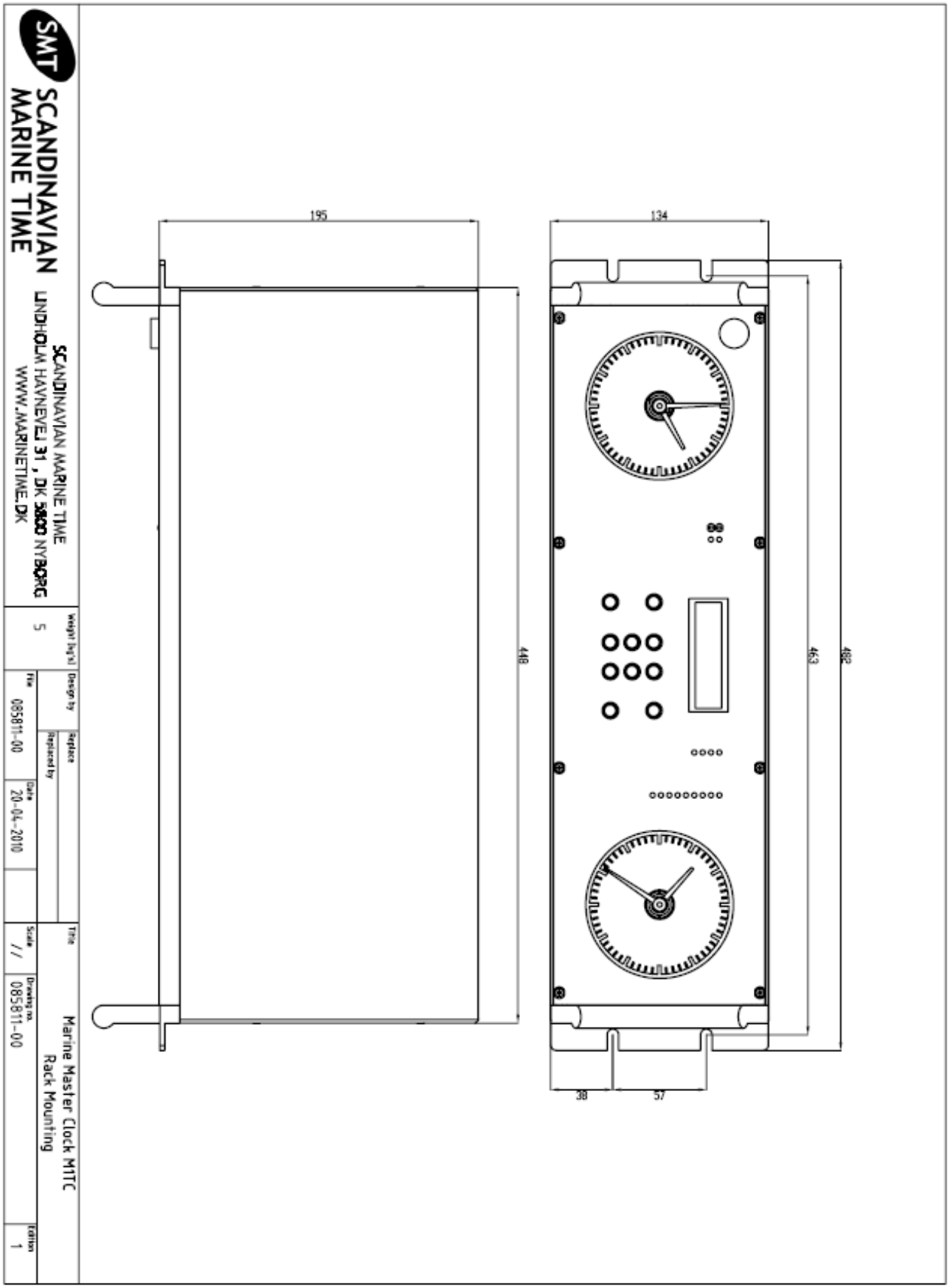
Ethernet LAN (option)

Protocol:	NTP according to RFC1305 and RFC1361, TCP/IP
Compatibility	Ethernet version 2/IEEE 802.3
Ethernet:	Connection 100BASE-T (RJ45)

Rules and regulations

The Marine Master Clock fulfils the rules according to IEC / EN60945:2002, maritime navigation and radio-communication equipment and systems.

Ordering information	
Master Clock Mark 1TC 230V + 24VDC	**8002878**
Master Clock Mark 1TC 230V + 24VDC + ETH	**8104407**


SMT
SCANDINAVIAN MARINE TIME
SCANDINAVIAN MARINE TIME
LINDHOLM HAVNEVEJ 31 , DK 9800 NYBORG
WWW.MARINETIME.DK
Weight [kg's]
5
Design by
Replace
Replaced by
File
085811-00
Date
20-04-2010
Scale
//
Drawing no.
085811-00
Title
Marine Master Clock M1TC
Rack Mounting
Edition
1
195
134
448
463
482
38
57

Slave Clocks

Various clocks

Slave Clocks 1610xx

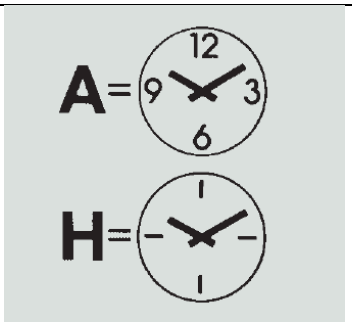
Functional Applications

Excellent legibility based on simplicity and functional design is the distinguishing feature of all SMT clocks. The clarity of the display is achieved through the use of a gently curved glass and a mat white face to set off the dark grey hands and symbols. The case is a subdued grey. With their distinct and simple design, SMT clocks blend tastefully in with many different environments.
The indoor clock is available in twinface configuration. The support bracket arm is adjustable for optimizing the distance to ceiling and wall.

Mechanical Construction

Maximum legibility

Face diameter	Legibility distance meter
230	8
300	12
400	25
600	50
900	100



The table serves as a rule of thumb for assessing maximum legibility distances in relation to face diameter.

Indoor clocks

Indoor clocks with ABS plastic case and curved glass

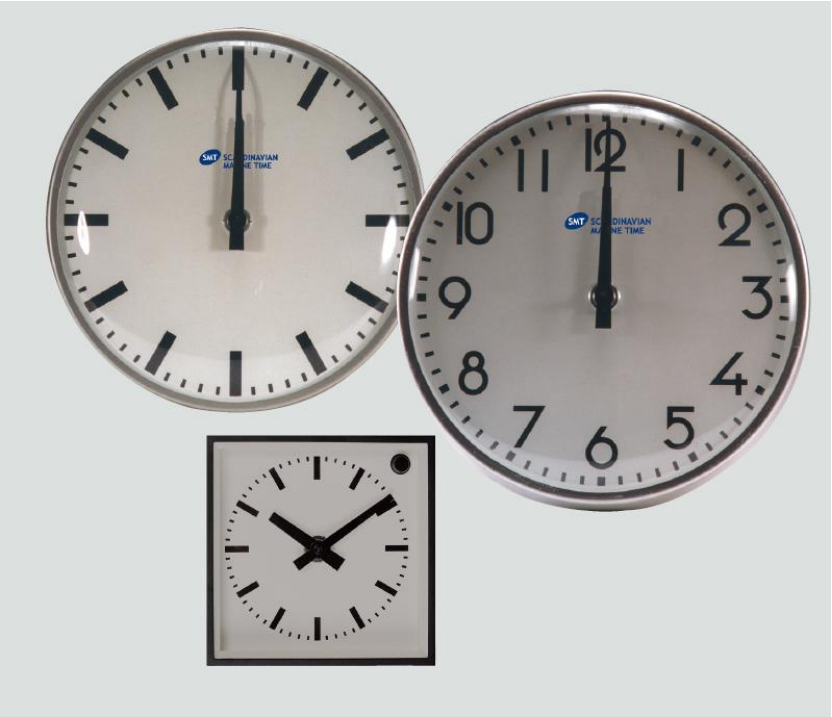
Dia. mm.	Face		Slave clock without second-hands Part No	**Semco Part No**
	A	H		
230	*		161000-00	**8096449**
"		*	161004-00	**8033259**
300	*		161012-00	on request
"		*	161016-00	on request
400	*		161024-00	on request
"		*	161028-00	on request

Bracket for indoor clock in twin-face configuration

All the indoor clocks listed above are avilable in twin-face configuration. Clocks are easily snapped in position on a special anodized aluminium bracket. The bracket arm is adjustable for correct distance to wall and ceiling.

Clock diameter	Distance from wall/roof to edge of clock	Part. No.
230	350-390 mm.	161375-00
300	440-500 mm.	161372-00
400	605-645 mm.	161373-00

Slave Clocks 1700xx



Code No	Dial	Size mm				Weight kg	Power consumption mA	Mounting	Note	**Semco part No**
		B	A	C	D					
170061-00	A	1-3	230	210	36	0,75	7,5	Wall	Forward	on request
170063-00	H	1-3	230	210	36	0,75	7,5	Wall	Forward	**8026931**
170065-00	A	1-3	300	280	36	0,95	7,5	Wall	Forward	on request
170067-00	H	1-3	300	280	36	0,95	7,5	Wall	Forward	on request
170081-00	A	1-3	300	280	36	0,95	7,5	Wall 1)	Forward	on request
170083-00	H	1-3	300	280	36	0,95	7,5	Wall 1)	Forward	on request
170033-00	H		144	144		0,85	7,5	Flush	Forward	on request

170060-00	A	1-3	230	210	36	0,95	15	Wall	Forward/backward	on request
170062-00	H	1-3	230	210	36	0,95	15	Wall	Forward/backward	**8000731**
170064-00	A	1-3	300	280	36	1,15	15	Wall	Forward/backward	**8063657**
170066-00	H	1-3	300	280	36	1,15	15	Wall	Forward/backward	on request
170080-00	A	1-3	300	280	36	1,15	15	Wall 1)	Forward/backward	**8002958**
170082-00	H	1-3	300	280	36	1,15	15	Wall 1)	Forward/backward	**8039911**
170030-00	H		144	144		1,05	15	Flush	Forward/backward	**8031225**

* at 24 Volt impulse A = Numerals H = Hour marks 1) Back cover, Plexiglass

Mechanical Construction

Design: Figur 1-3:

Housing of aluminium

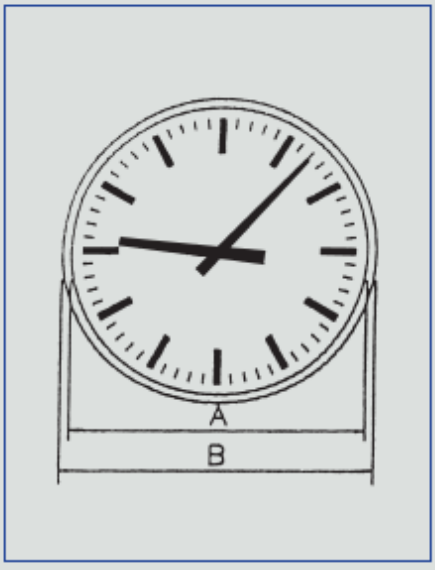
White dial face

Black numerals, marks and hands (red second hand)

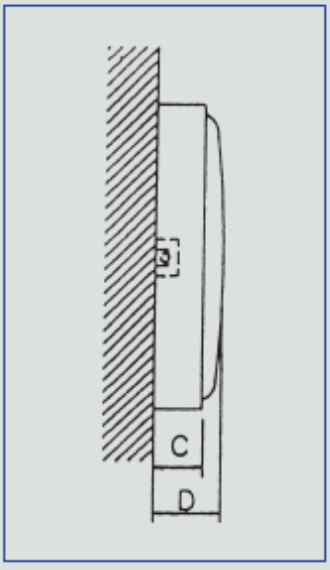
Convex protection glass

Dimensions

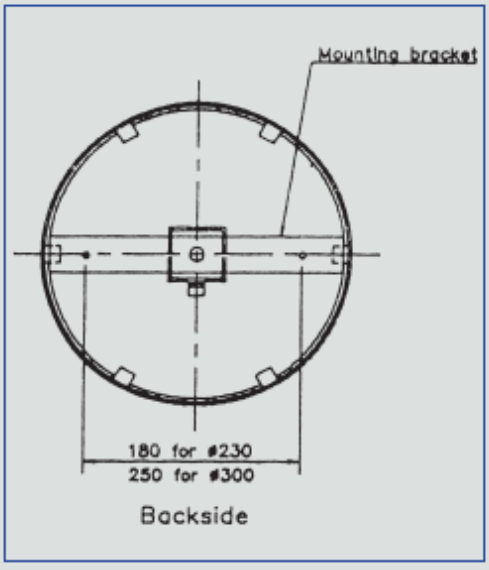
Figur 1



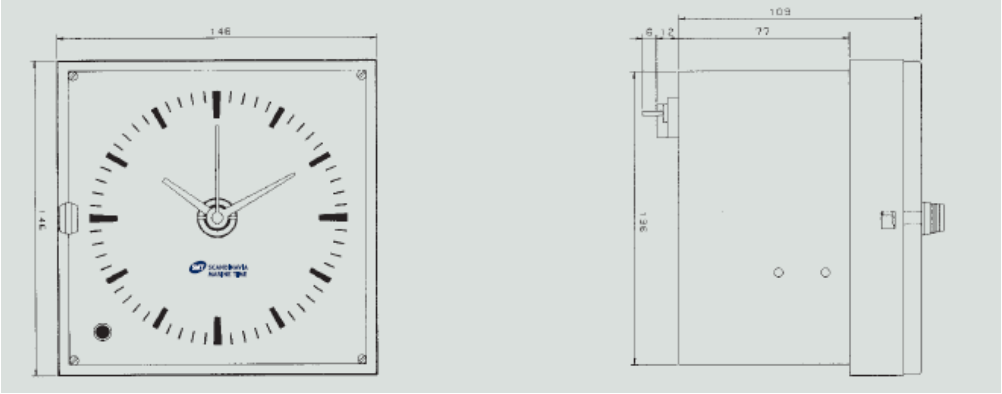
Figur 2



Figur 3



Flush Mounting - Slave Clocks SC 10/20



Functional Applications

Excellent legibility based on simplicity and functional design is the distinguishing feature of all SMT clocks. With this distinct and simple design, SMT clocks blend tastefully in with many different environments.

Mechanical Construction

Dimensions	Height:	146 mm
	Length:	146 mm
	Depth:	127 mm
	Weight:	Approx. 1 kg

Following types of Slave Clocks are available:

	Minute impuls	Min/Sec impuls	Min impuls 2,5 sec.	Illumination
SC 10.1 2 hands	*			
SC 10.1L 2 hands	*			*
SC 20.1 3 hands		*		
SC 20.1L 3 hands		*		*
SC 20.2 3 hands			*	
SC 20.2L 3 hands			*	*

Type Diplomat/Commander

DIPLOMAT:

• With lacquer, colour 800-15, aluminium case

Type No	Type No Double	Total Diameter mm	Diameter of Clock Face mm	Dept mm	Dept Double mm	**Semco Part No**
1001		165	150	50		on request
1002	1002D	265	250	55	110	**8031853**
1003	1003D	315	300	55	110	on request
1004	1004D	415	400	65	130	**8065051**
1005	1005D	515	500	65	130	on request
1006	1006D	615	600	65	130	on request

Choose between three standard faces: Arabic numerals, line or roman numerals.

Colour:

White lacquer, colour 800-15, aluminium case. Other colours can be delivered on request.

Diplomat double face:

Ceiling or wall mounting.

COMMANDER:

• White plastic case

Other colours can be delivered on request

Type No	Type No Double	Total Diameter mm	Diameter of Clock Face mm	Dept mm	Dept Double mm	**Semco Part No**
6087	6081D	255	245	60	120	**8004274**

Choose between three standard faces: Arabic numerals, line or roman numerals.

Standard colour:

White, grey, blue, red and black.

Commander double face:

Ceiling or wall mounting.

Indoor with LED-Illumination

Technical Data

Size	Dial Type	Single sided, wall mount
Dia. 300 mm.	A - numerals	Type No. 999203-01
Dia. 300 mm.	H-hour marks	Type No. 999203-01

Viewing Distance:	Dia. 300 mm. = 12 meters
Dial face:	White with black numerals, (A), or hour marks, (H).
Hands:	Black hour- and minute hands.
Impulse:	24 VDC
Illumination:	220 VAC
Weight:	1,0 kg
Case.	Aluminium, grey RAL 7037
IP Class.	IP52

Outdoor Clocks

Single/Double Face

• Grey lacquer, colour RAL 7035, aluminium case
• Other colours can be delivered on request

Outdoor 1004U series

Type No	Total Diameter mm	Diameter of clock face m	Dept mm	**Semco Part No**
1004U	446	390	115	**8006615**
1005U	550	500	115	on request
1006U	652	600	120	on request
1008U	852	800	220	on request
1010U	1092	1000	270	on request

Choose between three standard faces: Arabic numerals, line or roman numerals.

Illumination:
The slave clocks can be delivered with or without illumination.
Illumination: 230V 50/60Hz.

Outdoor, Double Face 1004UD series

Type No	Total Diameter mm	Diameter of clock face m	Dept mm	**Semco Part No**
1004UD	446	390	230	on request
1005UD	550	500	230	on request
1006UD	652	600	220	on request
1008UD	852	800	229	on request
1010UD	1092	1000	380	on request

Choose between three standard faces: Arabic numerals, line or roman numerals.

Illumination:
The slave clocks can be delivered with and without illumination.
Illumination: 230V 50/60Hz.

Single/Double Face, LED Illumination

• Grey lacquer, colour RAL 7037, aluminium case

• Other colours can be delivered on request

Type No	Total Diameter mm	Diameter of clock face	Dept. mm	Weight
400mm single face	406	380	90	5,0
600mm single face	620	560	110	6,5
900mm single face	920	860	110	11,5

Type No	Total Diameter mm	Diameter of clock face	Dept. mm	Max lenght	Weight
400mm double face, wallbracket	421	380	230	646	11
600mm double face, wallbracket	635	560	270	860	13,5
900mm double face, wallbracket	935	860	270	1160	21

Slave Clock for Galley, IP65

Technical Data

Size	Dial Type	Single sided, wall mount.	Double sided, wall- or ceiling mount.
Dia. 300 mm.	A - numerals	Type No. 5131120	Not available
Dia. 300 mm.	H-hour marks	Type No. 5133120	Not available
Dia. 500 mm.	A - numerals	Type No. 5151120	Type No. 5451120
Dia. 500 mm.	H-hour marks	Type No. 5153120	Type No. 5453120

Viewing Distance:	Dia. 300 mm. = 12 meters.
	Dia. 500 mm. = 40 meters
Dial face:	White with black numerals, (A), or hour marks, (H).
Hands:	Black hour- and minute hands.
Case/Protection cover:	Acrylic Plastic, colour RAL 7037/transperant
Ambient temperature:	20°C up to 50°C
Relative humidity:	Max. 85%
Weight:	Dia. 300 mm. Single sided = 2,0 kgs
	Dia. 500 mm. Single sided = 4,4 kgs
	Dia. 500 mm. Single sided = 7,0 kgs
Protection class:	IP65

Digital Clocks

LUMEX 5/7/12

LUMEX 5/7/12 is an elegant digital clock for indoor use designed to fit the sophisticated environments of today's Business society. The black case provides an elegant impression.

The digits formed of SMD diodes
Lumex 5 viewing distance up to 20 m
Lumex 7 viewing distance up to 35 m
Lumex 12 viewing distance up to 50 m
Diode colour available is red, green and yellow

The light intensity of the digits is adjustable by a dimmer control.
Easy to program – via three buttons (NTP configurated via web browser).
48 hours running reserve. After a mains failure correct time is automatically displayed.

Operation method
- Stand alone
- Slave Clock 24VDC polar reversing imp. 1/1-
alt. 1/2-min or Time Code from Master Clock
Other versions
- NTP, 230VAC or PoE (Power over Ethernet)
- Wireless
- RS232/World time
- IRIGB

Mounting/Installation:
Single sided for surface wall mounting or
single/double sided using bracket.

Options:
122983-00 Radio synchronization RDS
122984-20 Radio synchronization DCF-77
122980-00 Satellite synchronization GPS
Chronometer, temperature

Technical data

Housing:	Black aluminium
Front:	Polycarbonate
Protection class:	IP30
Standards:	EN61000-6-3:2001 EN61000-6-2:2005
Power supply:	Mains 230V 50Hz AC PoE (IEEE 802.3af)
Slave Clock/TC:	Impulse 4 mA
NTP:	SNTP, SNMP v1, HTTP, Telnet Fix IP address or DHCP 10BASE-T (RJ-45) connections Web-Based device management Support for DNS
Wireless:	External antenna on the housing Frequency 869.525 MHz Sensitivity 1µV (-107 dBm) Demodultation FSK +/- 25kHz
RS232:	Protocol acc to description 1621
IRIGB:	Format B123 AFNOR NFS 87500, IRIGB with date 1-5Vp-p modulated in 50 ohm

Type	Digits	Dim (HxWxD)	Weight	**Semco Part No**
Single sided versions				
Lumex 5	50mm	96x250x50mm	0,5 kgs	**8037581**
Lumex 5S	50/35mm	96x335x50mm	0,7 kgs	on request
Lumex 7	70mm	120x325x50mm	0,8 kgs	**8094492**
Lumex 7S	70/50mm	120x425x50mm	1,0 kgs	**8138592**
Lumex 12	120mm	200x450x50mm	1,8 kgs	on request
Lumex 12S	120/100mm	200x600x50mm	2,6 kgs	**8055693**
Double sided versions (dim excl. bracket)				
Lumex 5	50mm	96x250x70mm	1,0 kgs	on request
Lumex 5S	50/35mm	96x335x70mm	1,4 kgs	on request
Lumex 7	70mm	120x325x70mm	2,0 kgs	on request
Lumex 7S	70/50mm	120x425x70mm	2,8 kgs	on request
Lumex 12	120mm	200x450x70mm	3,2 kgs	on request
Lumex 12S	120/100mm	200x600x70mm	4.3 kgs	on request

Digital Panel Clock

Examples of applications:

- TV- and Radio studious
- Control rooms
- Laboratories
- Busses
- Fire Stations
- Air traffic control room
- Ships

Digital Panel Clock for recessing is a small clock for numerous applications.
It can either be used only as "normal" clock, or as chronometer (option) for counting-up or down of time and is soundless which also makes it the perfect choice for environments sensitive to sounds

- For recessing in a console acc. To DIN 43700 or for recessing in wall
- Indicating time inhours, minutes and seconds. Red digits of LED:s and 14 mm height. The brightness of the LED:s is adjustable via a push button (dimmer) on the front
- Fully automatic correction of summer/winter time
- Alarm input for indication of alarm (choosing potential-free contact)
- Time setting is easy made by three push buttons on the front
- The clocks for operation either as stand-alone unit (quartz crystal) or by 24 V pol.rev.1/1 impulses from master clock and for connection either to 230 V AC or to 24 V DC
- The clocks can also be provided with chronometer function (option) for count-up or down of time. In this case, the delivery also includes a remote control, from which the chronometer function is controlled

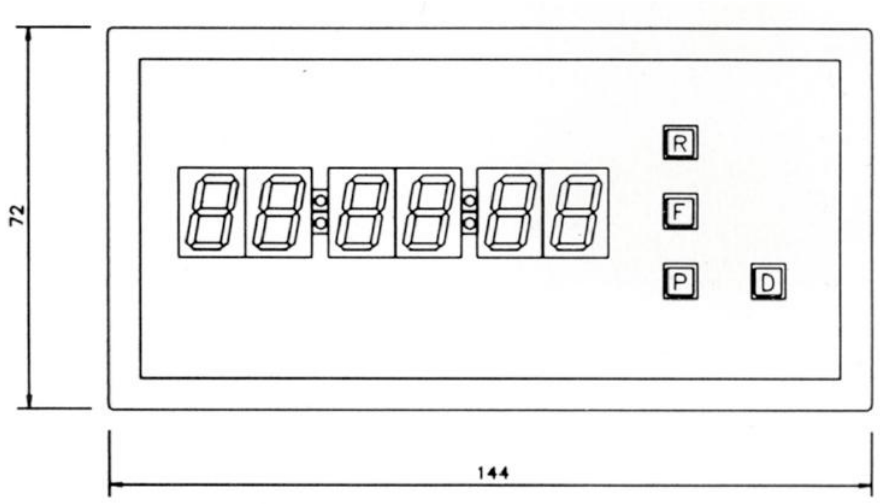
Options/Accessories

- Battery package 500 mAh which gives approx.
  1 hour running reserve at max brightness of the LED:s and
  2 hours running reserve at min brightness
- Chronometer function includes remote control and 5 meter cable
- RS 232
- IRIG-B
- IRIG-E

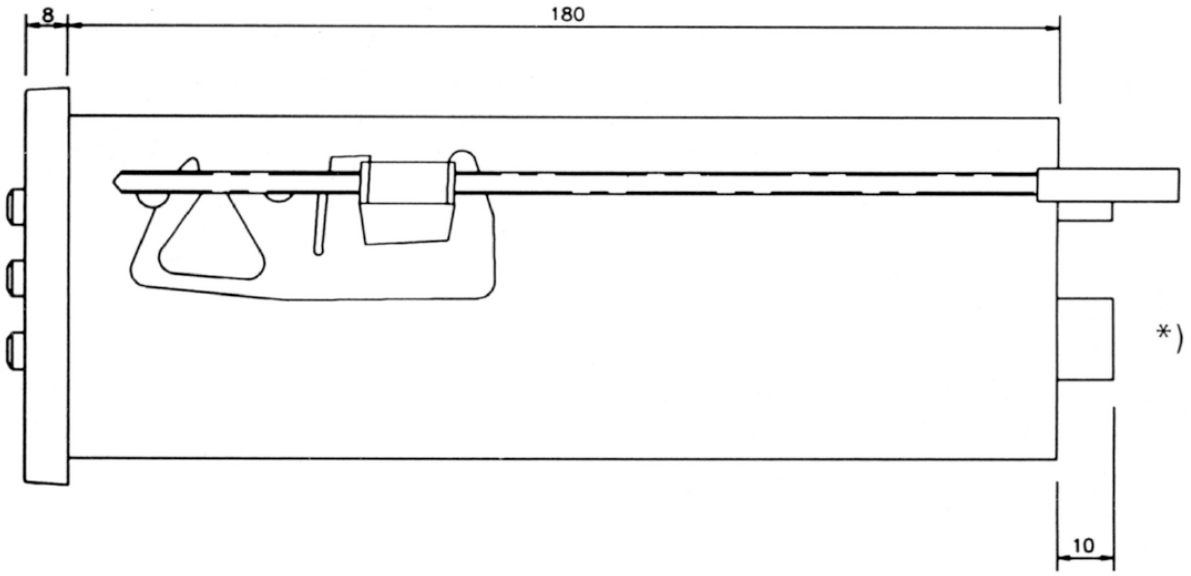
Technical information

Art. No	Operation	Connection	Power consumption	Weight
119500-00	min.imp.	24 V DC	Approx.400 mA, with battery approx. 450 mA	0,8 kg
119502-00	quartz	24 V DC		0,8 kg
119510-00	min.imp.	230 V AC	Aprox. 30 mA with battery 35 mA	1,0 kg
119512-00	quartz	230 V AC		1,0 kg

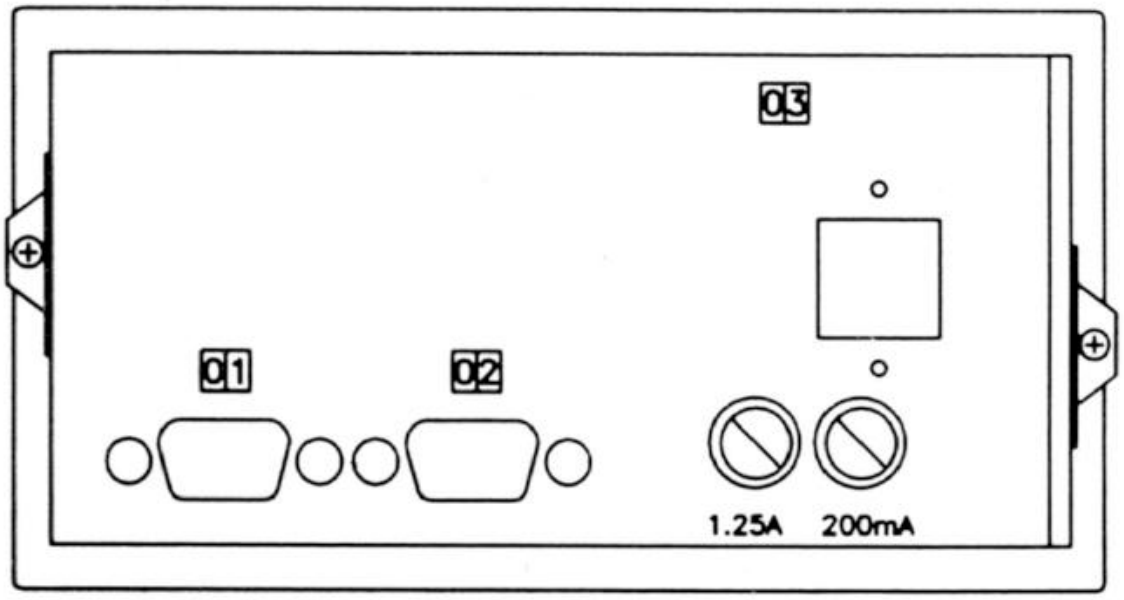
Crystal frequency:	4,194304
Accuracy:	0,1 sec./24 hours (at +20 ^{0}C)
Microprocessor:	HD 6303R
Ambient temperature:	0 °C to +40 °C
Relative humidity:	Max. 95%
Case:	IP 52, black plastic (Noryl)



Measures for recessing =138 x 66 mm.
Max. console/wall thickness = 7 mm



*) connector 230 V AC, 45 mm.



Connections
01=9-pol. for minute impulse input and chronometer
02= Serial input (option)
03= 3-pol. 230 V AC connection

Fuses
1,25 A (slow) for battery
200 mA (slow) for 230 V AC