2 Unpacking and Installation

2.1 Scope of delivery

2XV9450-1AR52 / 53 (SICLOCK TS single unit)
- SICLOCK TS single unit E10433-E0308-H100 / H110 with attached terminals X1and X2
- User Manual SICLOCK TS 2XV9450-1AR53-BA

2XV9450-1AR54 / 55 (SICLOCK TS complete package with GPS 1000)
- SICLOCK TS single unit E10433-E0308-H100 / H110 with attached terminals X1 and X2
- User Manual SICLOCK TS 2XV9450-1AR53-BA
- GPS 1000 antenna E10433-E9910-H100
- User Manual GPS1000 2XV9450-1AR82-BA
- Surface distributor box IP54
- Cube with cover cap and six hexagon socket set screws
- Holding elements (carrier arm and base plate)
- Hexagon socket screw key for cube mounting

2XV9450-1AR56 / 57 (SICLOCK TS complete package with DCF)
- SICLOCK TS single unit E10433-E0308-H100 / H110 with attached terminals X1 and X2
- User Manual SICLOCK TS 2XV9450-1AR53-BA
- Active DCF77 antenna 2XV9450-1AR16
- User Manual SICLOCK DCFRS Industrial Version 2XV9450-1AR48
- Surface distributor box IP54
- Cube with cover cap and 6 hexagon socket set screws
- Holding elements (carrier arm and base plate)
- Hexagon socket screw key for cube mounting

2.2 Unpacking

After function inspection, the unit is packed fully assembled and has no internal transport safety devices.

In the case of significant differences in temperature between the means of transport and the place of unpacking, it is recommended that the unit is left in the transport packaging, in order to avoid potentially harmful condensate (e.g. 12 hours at 20 °C temperature difference and longer for greater differences.)

☞ **Please check the consignment is complete and inspect for signs of damage. Any complaints must be reported to the local Siemens subsidiary and if it is necessary to return the consignment, then the original transport packaging should be used.**

2.3 Installation

SICLOCK TS must be installed in the switch cabinet in an easily accessible position.

The housing can be fixed to a DIN rail **(EN 50022-35)** or **SIMATIC S5 standard profile rail (6ES5 710-8maxx)** with the aid of a snap fastening.

For ease of fixing and detaching the unit to and from the DIN rail and for unhindered heat dissipation there should also be a free space of 50 mm left above the unit **(115 mm above upper edge of the DIN rail)**.

A free space of **at least** 50 mm should be left below the unit **(85 mm below lower edge of the DIN rail)** for the process cable connectors.

We recommend the installation of a suitable cable channel below this free space.

☞ **Care must be taken that the snap fastening is properly locked.**

3 Connecting the power supply.

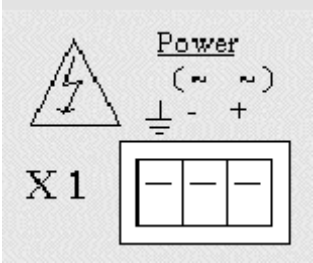
Connection to the power supply is at the terminal bar X1, and should always be carried out via a 10 A automatic circuit breaker for all unit versions, as the unit does not have its own mains switch.	

Figure 1: Connecting the power supply.

☞ **In the case of DC voltage it is important to check the correct polarity. In all cases the protective earth must be connected.**

Checkbox

As soon as it is switched on the unit carries out a self-test. The LED U1, U2 and U3 must be illuminated, otherwise the power supply must be examined or the service department informed.
Immediately after switching on, the display is completely blank. If no image has appeared after up to 30 seconds, then the contrast can be adjusted to brighter or darker by means of the keys ○ or ●, until an image appears. If after waiting a longer time and despite contrast adjustment there is still no image, then there is an error in the unit which must be reported to the service technicians.

The display **1A** shows the current system time, the network status and the synchronization status.

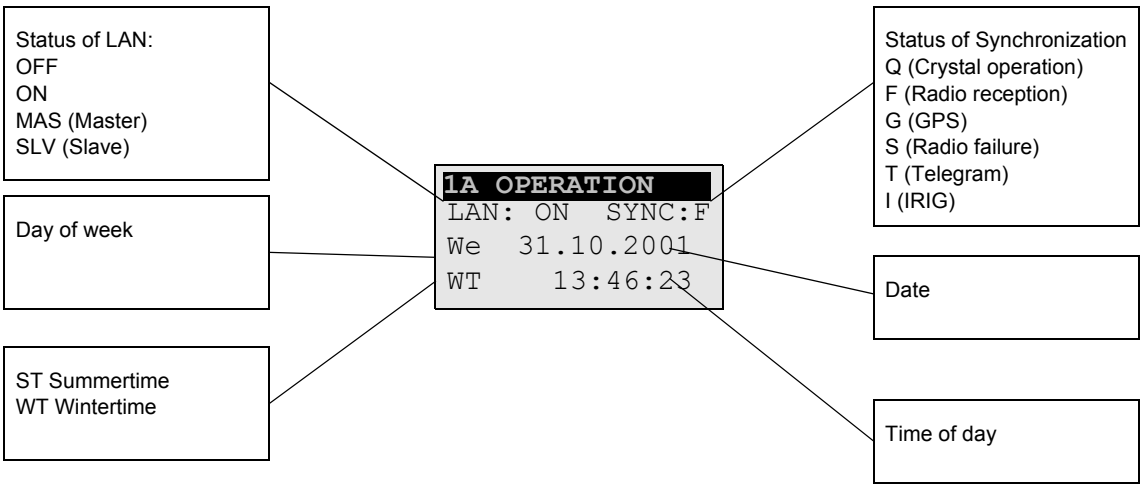


Figure 3: Status display "OPERATION" (1A).

The displays **1B** and **1C** show the current parameterization of the LAN.

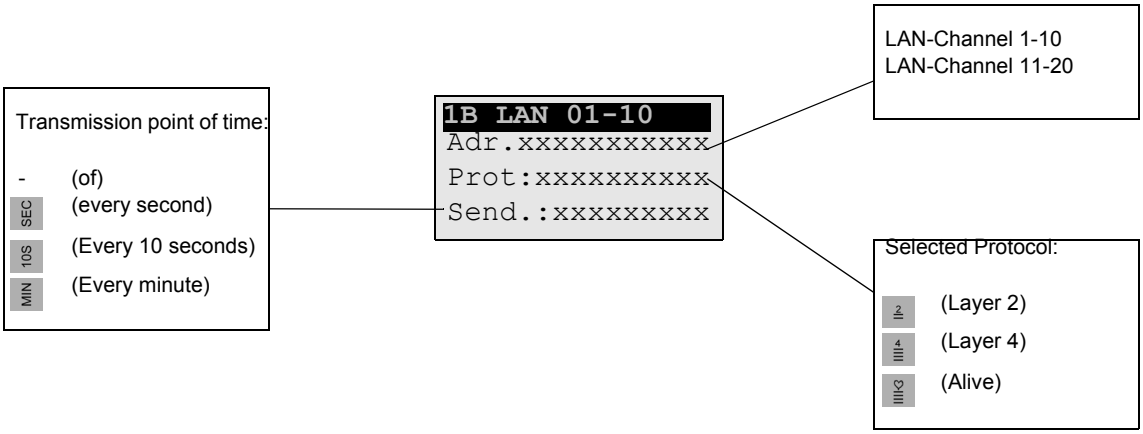


Figure 4: Status display "LAN 01-10" (1B) respectively "LAN 11-20" (1C).

The display **1D** shows the current parameterization of the point-to-point outputs:

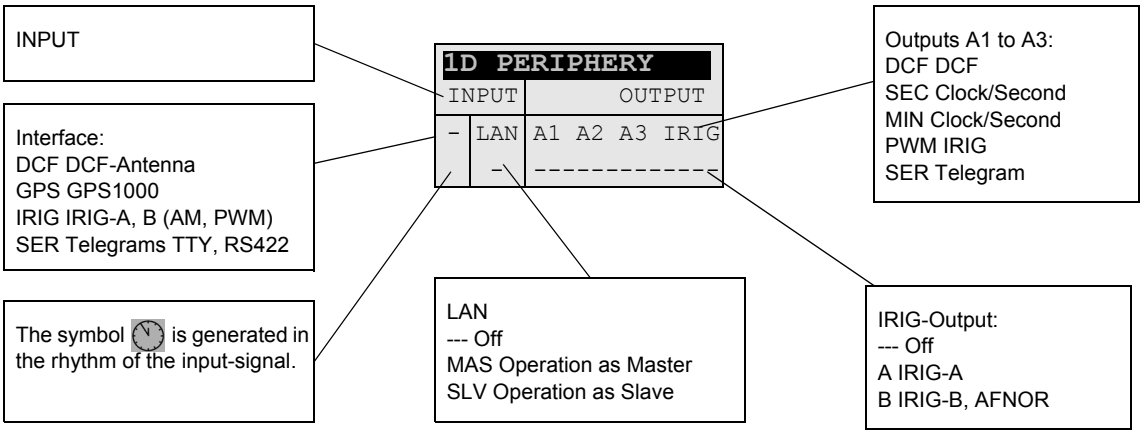
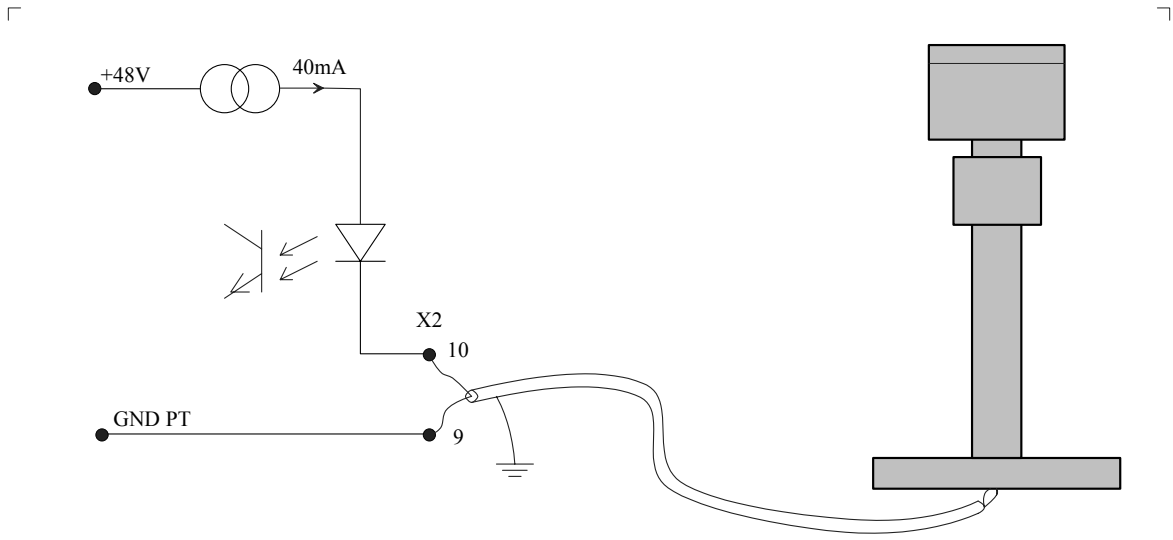


Figure 5: Status display "PERIPHERY" (1D).

5 Inputs for synchronization sources

5.1 Connection of SICLOCK GPS1000

The GPS receiver GPS1000 is connected to the input E1 of SICLOCK TS. The shield of the connection cable between GPS1000 and SICLOCK TS for entry to the switch cabinet should in all cases be laid on the equipotential busbar.



SICLOCK TS	Shield (normally equipotential busbar of the cabinet)	GPS1000
Parametering SICLOCK TS		
230/4A Input E1 source	"GPS1000"	
Polarity of the connection wires of GPS1000 is unimportant (reverse battery protection)		

Figure 9: Radio clock connection SICLOCK GPS1000

Parameterization of GPS1000 is not required (see User Manual GPS1000).

Checkbox

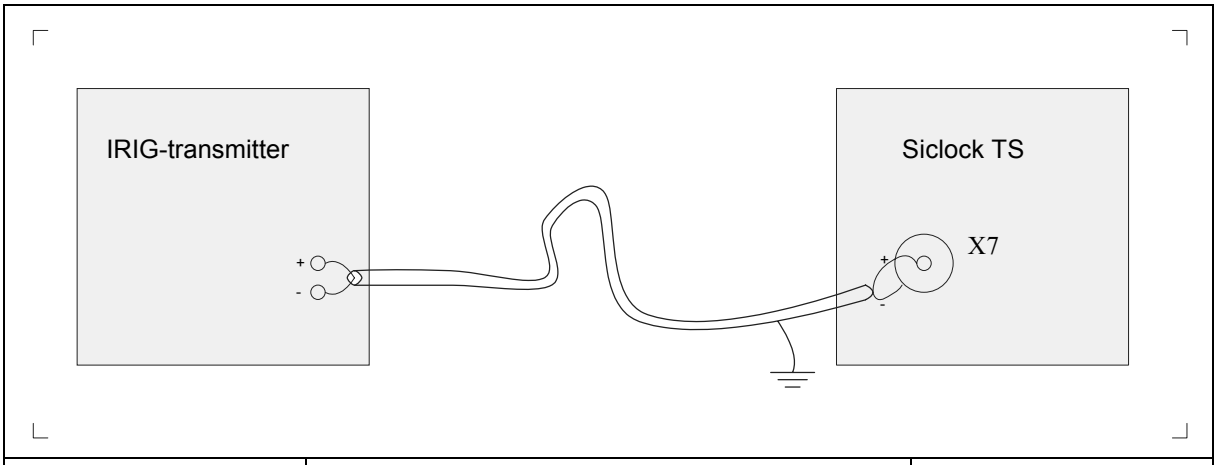
The signal indicator in menu **1D** must flash at regular intervals (cleanly in one second tact). If the indicator stays off statically, check that the cabling and parameterization are correct. After two minutes, the synchronization indicator in menu **1A** switches to **G**. If the indicator stays on **S** for some time, then the GPS antenna temporarily does not "see" GPS satellites (e.g. due to the reception angle to the sky being too narrow). This situation can easily be overcome due to the high precision based on the crystal calibration function. If the indicator stays on **Q** continuously, then GPS1000 must be checked, including the wiring and parametering.

Checkbox

The signal indicator in menu **1D** must flash at regular intervals (in one second tact). If the indicator stays off statically, check that the cabling and parameterization are correct. After 5 consecutive DCF protocols are fully received, the synchronization indicator in menu 1A switches to **F**. If the indicator stays on **S** for some time, then the GPS antenna temporarily does not receive any satellite (i. e. due to the reception angle to the sky being too narrow). This situation can easily be overcome due to the high accuracy based on the crystal calibration function. If the indicator stays on **Q** for a longer time, then GPSDEC must be checked including the wiring and parametering.

5.4 Connection of IRIG time sources

The IRIG formats IRIG-A133 or IRIG-B123 (both modulated sine carriers) are connected via the BNC bush X7. The input can be 60 Ohm, 600 Ohm or >5kOhm (parameter: 260/4C). The IRIG input X7 is potential separated by a transformer. The polarity of the leads is not important. A reverse polarity connected IRIG signal is recognized and automatically corrected. Since no year figures are coded in the IRIG standard 205-95, SICLOCK TS supports the so-called AFNOR format, in which the IRIG standard is supplemented with the year figures. AFNOR is recognized automatically when received. The straight format is in parameter 282/4C. To transmit AFNOR, parameter 306/5D *Output IRIG* must be set to *AFNOR(B)*.



IRIG transmitter	Shielded two-wire lead	SICLOCK TS
Parametering SICLOCK TS		
250/4A input E1 source	“IRIG-A,B (AM)“	
260/4C E1-IRIG impedance	“> 5kOhm“	

Figure 12: Connection of SICLOCK TS to systems using IRIG

The pulse-width modulated IRIG digital signal (format A003, B003) can be read in via RS422 and given out on RS422 or TTY. For the reception of IRIG-PWM via RS422, the parameter 250/4A must be set at *IRIG-A,B (PWM)*. The output of the PWM signal on RS422 is achieved by setting the parameter 304/5C *Modus A3* to *IRIG (PWM)*. For the output of the PWM signal on TTY, the parameter 300/5A or 302/5B is set to *IRIG (PWM*).

The IRIG-PWM signal must be connected with the correct polarity.

8 Outputs

8.1 Cabling the hardware

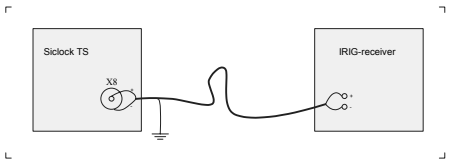
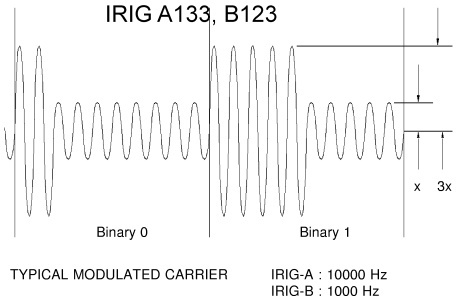
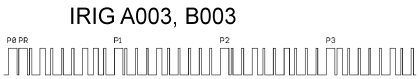
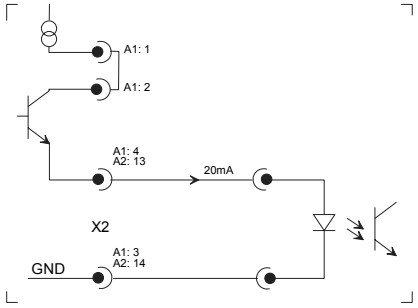
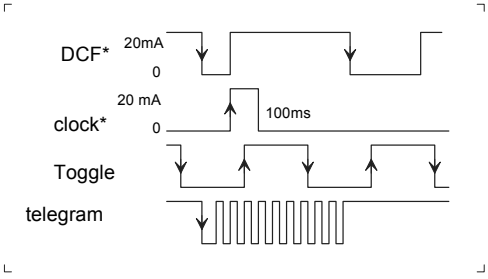
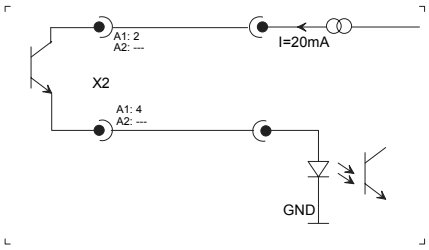
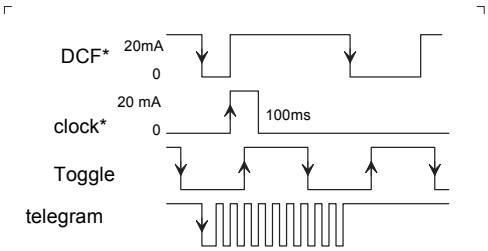
	Connection	Signal type
IRIG (analog)		
IRIG (digital)	TTY (active), TTY (passive), RS422 (wiring see: Figure 16)	
TTY (active)		
TTY (passive)		

Figure 15: Wiring diagram of outputs for the different types of signals.

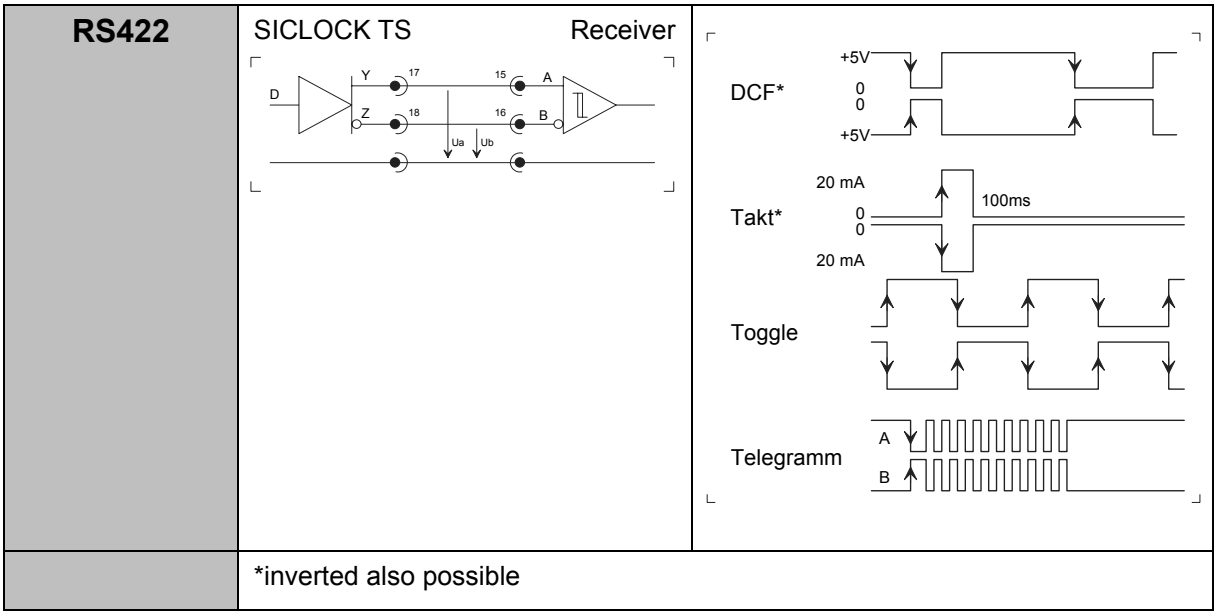
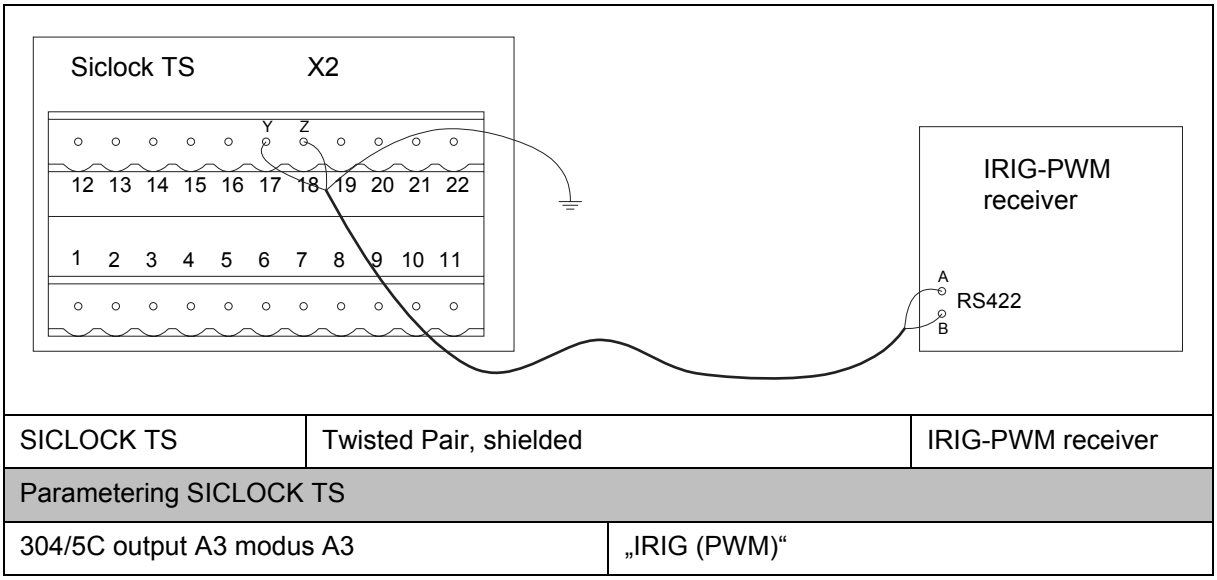


Figure 15: Wiring diagram of outputs for the different types of signals.



SICLOCK TS	Twisted Pair, shielded	IRIG-PWM receiver
Parametering SICLOCK TS		
304/5C output A3 modus A3	„IRIG (PWM)“	

Figure 16: Connection of SICLOCK TS to a IRIG-PWM receiver

8.2 Output formats

SICLOCK TS has four output interfaces available which are designated in the menu as *A1*, *A2*, *A3* and *IRIG*.

Output	Interface	Connection
A1	TTY active/passive	X2; Pins 1 to 4
A2	TTY active	X2; Pins 13, 14
A3	RS422	X2; Pins 17, 18
IRIG	IRIG	X8, Pins 1, 2

Table 7: Outputs of SICLOCK TS

9 Ethernet

9.1 Interface selection

The physical bus access is specified through the parameter 339/6A *LAN connection*. When using "Twisted Pair" no difference is made between RJ-45 (connection to X6) and ITP (connection to X5). This is automatically recognized at the plug and displayed in the observation parameter 340/6A *Twisted Pair*.

9.2 Source addresses

Setting of the MAC source address of SICLOCK TS is in two parts and is carried out through parameters 341/6A *source addr. part 0* and 342/6A *source addr. part 1* by entering the Hex value. When using IP-based protocols (S)NTP, SNMP) parameters 343/A IP source addr, 344/6A *subnet mask* and 345/6A *default gateway* must be specified in addition.

9.3 Parameterizing a channel (SINEC protocols)

The individual parametering of up to 20 bus addresses is carried out in the menus 6B to 6E. The protocol to be used for the bus addresses is specified by the parameter *Addr. * Protocol*. The values have the following meaning:

- "**Layer 2 - S5**" - time telegram compatible to the former SIMATIC NET time transmitter (Standard for SIMATIC S5, S7 and Windows reception service 2XV9450-1AR44)
- "**Layer 2 - DST"** - Summertime based special layer 2 time telegram (for former SIMATIC S7 with firmware versions below 5 only)
- "**Layer 2 - GMT**" - GMT-based layer 2 time telegram (at present not available in SIMATIC)
- "**Layer 4**" - layer 4 time telegram compatible with SIMATIC NET time transmitter
- "**Alive**" - SICLOCK-Alive-Telegram for redundant configuration

Through the parameter *Addr. * Transmit* the transmission cycle is parameterized or this channel switched off. Setting the MAC bus addresses is made easier with the parameter *Addr.* Def.*, here for the address parameters *Addr. * Dest.0* and *Addr. * Dest.1* the pre-allocations "broadcast" (FFFFFFFFFFFF), "multicast" (090006010000) and "individual" (080006010000) can be selected. Addresses which deviate from these can be defined in the address parameters.

* Nos. 1-20 for relevant LAN channel

11 Alarms and Warnings

11.1 Overview

SICLOCK TS automatically carries out diverse function tests during operation. In the event of error the appropriate messages are generated by the unit in the display. These are differentiated into alarms and warnings. For external monitoring an insulated change-over contact can be wired over X2 (alarm relay).

☞ **(Unfiltered) alarms always lead to the alarm relay being released.**

Many messages have a fault value, which can be utilized for closer diagnosis.

11.2 Cabling the alarm relay

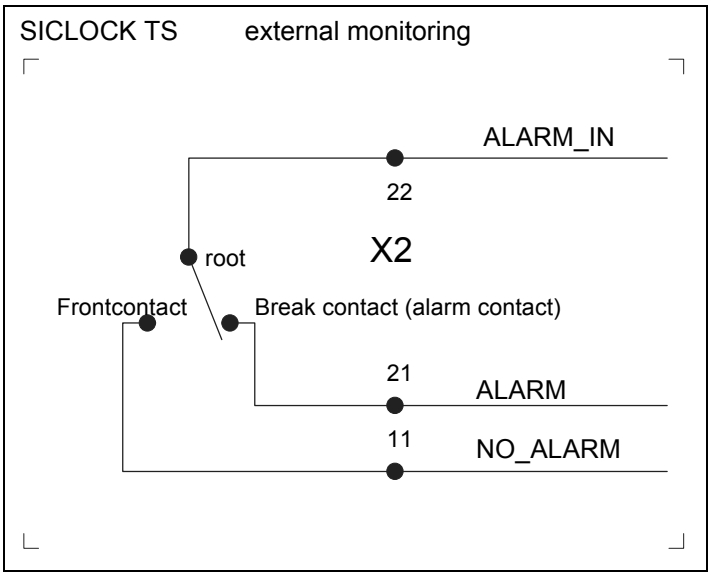


Figure 17: Cabling the alarm relay.

11.3 Fault filter and warning enable

With the parameters 165...168/7B *Fault filter 1...4* the relevant alarm can be suppressed. This includes both the message on the display and also the release of the alarm relay. The parameter should be set at the corresponding alarm.

Through the parameter 169/7B *enable warnings*, all the warnings can be suppressed.

Alarm "DCF77 Error"
Two complete consecutive DCF protocols could not be received within the parameterized timeout.
The signal received can be checked with the signal indicator in menu 1D. If this is off, the cause of the error must be looked for in the cabling or active/passive parameterization.
If there is an irregular signal indicator, the reception quality is not sufficient. In this case the connected antenna must be re-aligned or re-installed somewhere else.

13.5 Technical data

Inputs	1 TTY 20mA (telegrams, DCF77) active/passive insulated	Terminal block X2, pins 5-8
	1 TTY 40 mA (GPS1000)	Terminal block X2, pins 9, 10
	1 RS422 (telegrams, IRIG-A003,B003)	Terminal block X2, pins 15, 16
	IRIG-A133,B123	BNC bush X7
Outputs	1 TTY 20 mA active/passive, 24V	Terminal block X2, pins 1-4
	1 TTY 20 mA active, 24V	Terminal block X2, pins 13,14
	1 RS422	Terminal block X2, pins 17, 18
	IRIG-A133,B123	BNC bush X8
Alarm relay	Change-over contact DC: 150V/1A 30W AC: 125V/1A 60VA	Terminal block X2, pins 11, 21, 22
LAN connection	AUI 10BASE5	15-pol. SUBD bush X5
	10BASE-T	RJ45 bush X6 15-pol. SUBD bush X5 (ITP)
Interfaces	RS232 PC interface	9-pol. SUBD bush X3
Output voltage	24V/0,5A insulated	Terminal block X2, Pin 19, 12
Supply voltage	24V...110V DC +10%, -20% or DC: 90V...250V DC +10%, -20% AC: 90V...230V AC +10%, -20% 50/60Hz	3-pol. Terminal block X1
Power consumption	approx. 60 W, 180W when switched on	
Fuses	10 A neutral	
Precision	internal clock	50 ppm at 25°C free running 0,07...1ppm depending on synchronization
Precision	IRIG	1ms
Power reserve	internal clock	>14 days buffered without batteries
Surrounding temperature	0…50 °C	
Protection class (acc. to IEC529)	IP 20	
Dimensions	dimensions (W x H x D)	250 x 135 x 142mm
Installation	35mm DIN rail	DIN rail EN 50022-35 (15mm high) or SIMATIC S5 norm profile 6ES5 710-8Maxx
Weight		3,2 kg

Table 14 Technical Data