

- 1 clips (to fasten the MOD at the belt)
- 2 battery compartment
- 3 LED
- 4 radio connection output (socket or cable)
- 5 radio connection input (socket or cable)
- 6 DIN-socket MOD-TX: data- and signal input, as well as external supply
- 7 DIN-socket MOD-RX: data- and signal output, as well as external supply
- 8 device-key
- 9 device-switch
- 10 device sticker
- 11 speaker (not for every radio necessary)
- 12 code-switch (10 positions - to adjust the channel for RX-C10)
- 13 code-switch (16 positions - to address radio)
- 14 level-potentiometer

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1. GENERAL

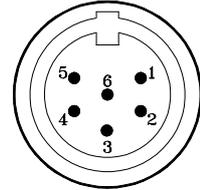
- Use:** Wireless transmission of timing impulses or timing data with a radio set
- Transmission System:** Transformation of impulses or data to tone signals in the MOD-TX. Transmission of the tone signals by a radio set. The MOD-RX transforms the tone signals again to impulses or data.
- Radio Sets:** Connections and internal electronic is for almost each radio set producer different. This is the reason for the adoption from ALGE from the MOD for almost every radio set. The MOD is only usable together with this radio set.
After you connect the MOD-RX at the radio, only the speaker of the MOD-RX is functioning, but not from the radio.
Use the MOD only with approved radios. If you use a radio, that is not approved in the country of use, you risk a fine and the lost of the radios.
- MOD-Types:** **MOD-TX:** Transmission Unit
 MOD-RX: Receiving Unit
- Minimum Configuration:** 1 MOD-TX, 1 MOD-RX, 1 pair of radios
- Extended Configuration:** additional **MOD-TX** for impulse transmission and data transmission
 additional **MOD-RX** for data transmission
 RX-C10 for impulse transmission from more than 2 timing channels
- Identification for MOD-TX:** Device sticker (10) with green layout
- Identification for MOD-RX:** Device sticker (10) with red layout
- Impulse Transmission:** The impulse transmission works form a ALGE impulse trigger to a ALGE timing device.
- Data Transmission:** Each data string will be transmitted 10 times. One data string is transmitted per second.
- System Test:** Interference Test: check the used frequency by listening
- Power Supply:** 9 Volt Alkaline Battery
 or external supply

2. POWER SUPPLY

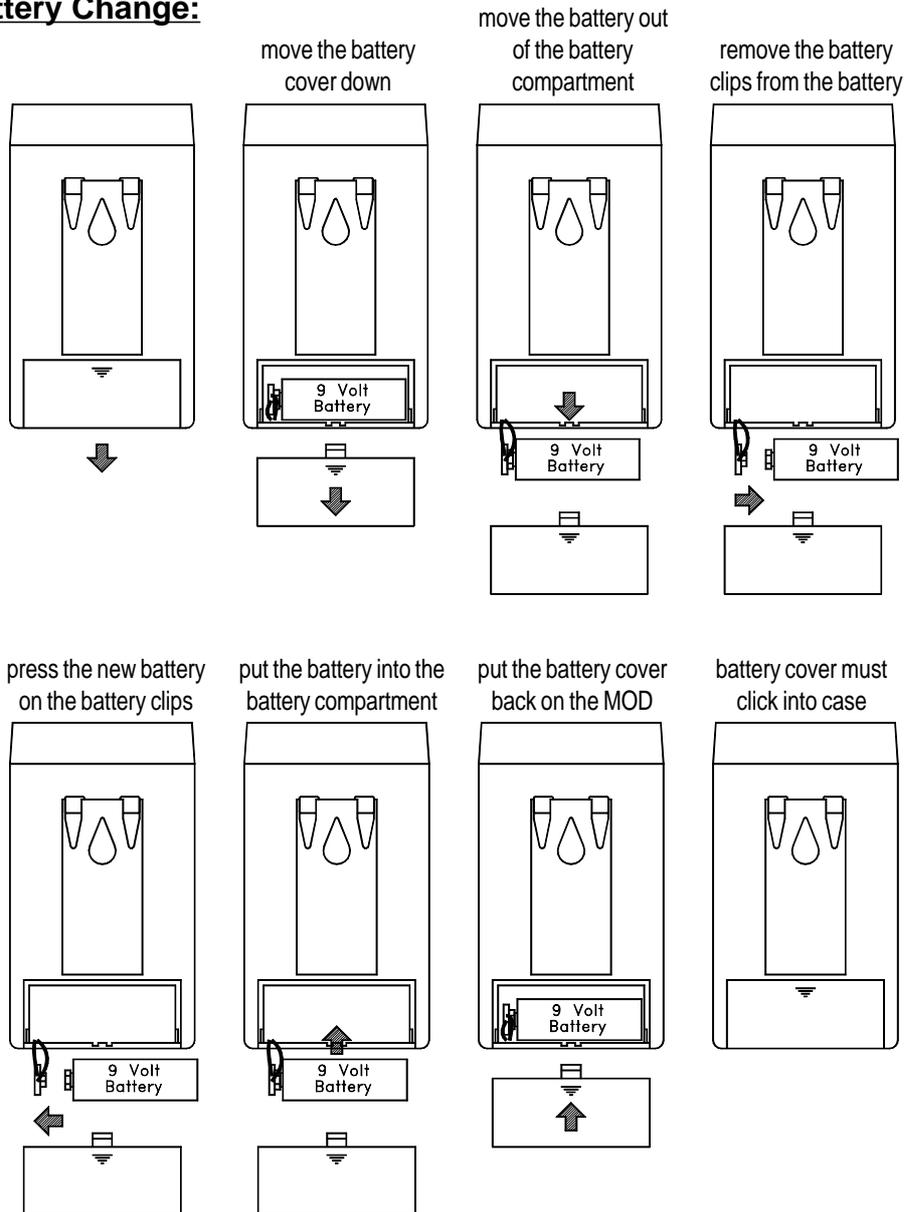
The following ways are possible to supply the MOD:

- internal supply: with 9 V Alkaline battery
- external supply: e.g. from ALGE timers
DIN-socket (6) and (7): PIN 3 ground
PIN 4 +6.5 to 28 VDC
PIN 5 +5 V stabilized

If you supply the MOD with from PIN 5 (+5Vstab.) you must not turn the device-switch (9) on. If you turn it on, it uses the internal battery instead of the external supply.



2.1. Battery Change:



2.2. Battery Capacity:

Each MOD needs a 9 V Alkaline battery. The LED (3) shows the battery condition (battery capacity) during the normal operation.

Blinking of LED (3):

Color of LED (3)	Battery Capacity
green	20 bis 100 %
border between green and orange	about 20 %
orange	10 to 20 %
border between orange and red	about 10 %
red	less than 10 %
off	empty

The MOD turns automatically off, if the battery voltage goes bellow 5 VDC!

Working duration of batteries:

The measurements shown bellow are made with Alkaline batteries (type Energizer) at room temperature (25°C / 77 F). Please notice that the capacity of the batteries drops fast at low temperatures (at -20°C (-4F) about 20 % capacity).

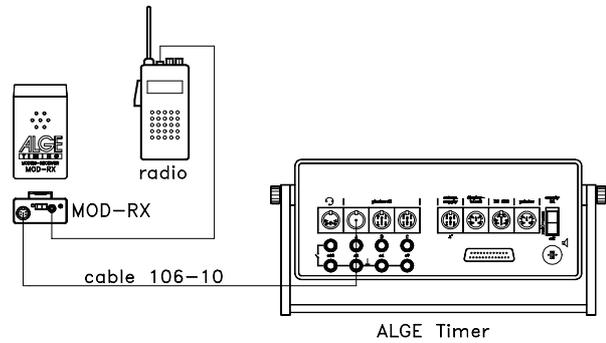
Table for use with a 9 Volt Alkaline Batteries at 25°C (77F) with one impulse per minute:

MOD-TXabout 140 hours
 MOD-RXabout 40 hours

2.3. External Supply from an ALGE Timing Device:

2.3.1. Impulse Transmission:

If you work in the impulse transmission mode you can supply the MOD-RX direct from the timing device (TdC 8000 or Timer S4). For this purpose use cable 106-10 between the MOD-RX and the timer (cable 004 has only a supply if you use the a power supply for the timer).

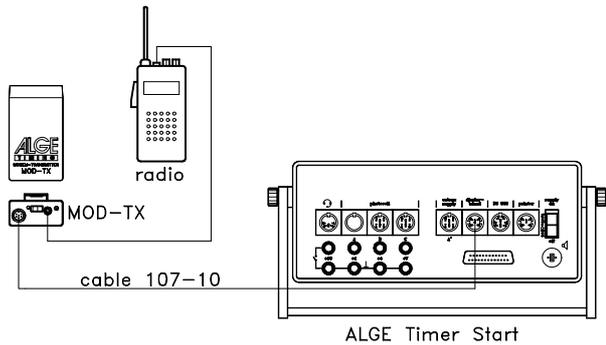


Do not turn the device switch (9) of the MOD-RX on, if you use cable 106-10. If you turn it on, it will use the internal battery instead of the external supply.

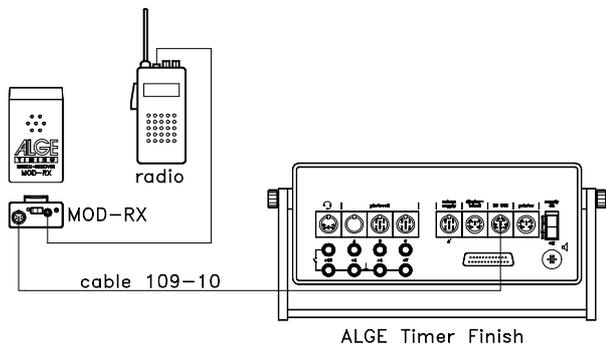
2.3.2. Data Transmission:

When using the data transmission mode, it is possible to supply the MOD-TX and MOD-RX direct from the timer.

MOD-TX (e.g. with Timer S4):
cable 107-10 between MOD-TX and timer



MOD-RX (e.g. with Timer S4):
cable 109-10 between MOD-RX and timer



3. OPERATION

3.1. Setup the Radios:

The reach between two radios depends much from its position. Mostly you improve the field strength by moving the radios to the right position (high field strength = high impulse or data safety). If you have a bad speaking performance, you will have also a bad performance to transmit impulses or data.

- The antenna must always point upwards.
- The radio should never stand direct on the floor. This decreases the reach.
- Conducting parts next to the antenna are not allowed.
- People should not stand before the antenna in direction to the other radio.

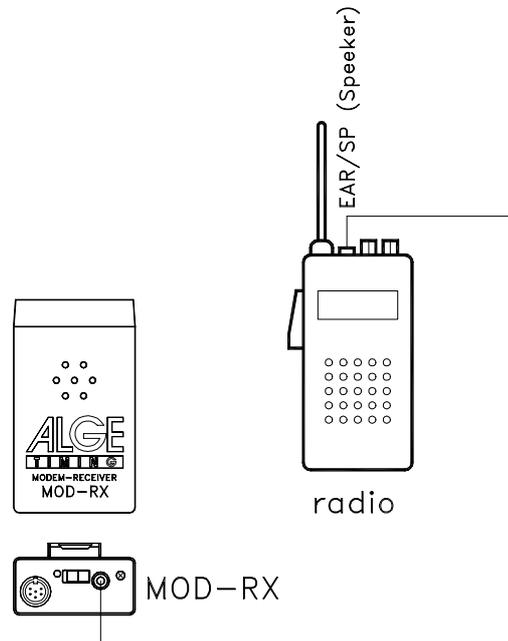
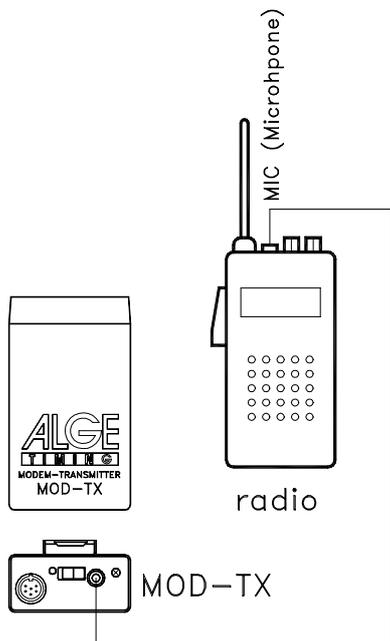
3.2. Connecting the Radio at the MOD-TX and MOD-RX:

MOD-TX:

Cable from MOD-TX (socket 4) to the radio (socket for microphone (MIC)).

MOD-RX:

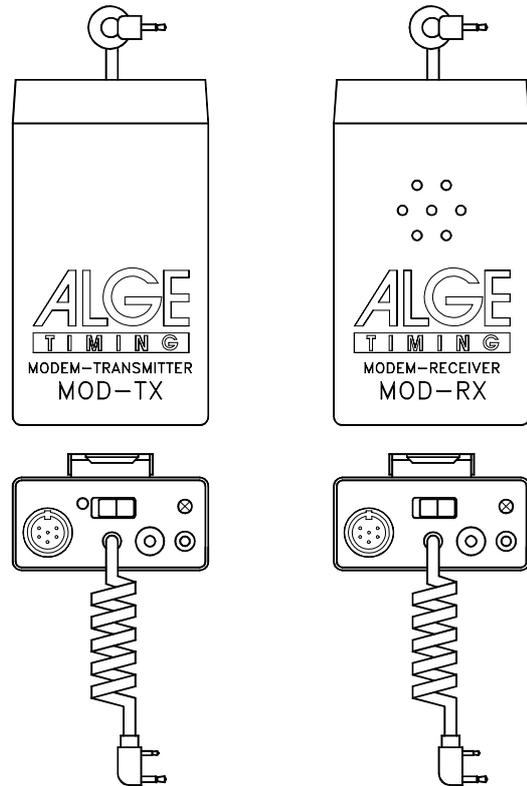
Cable from MOD-RX (socket 5) to the radio (socket for headset (EAR or SP)).



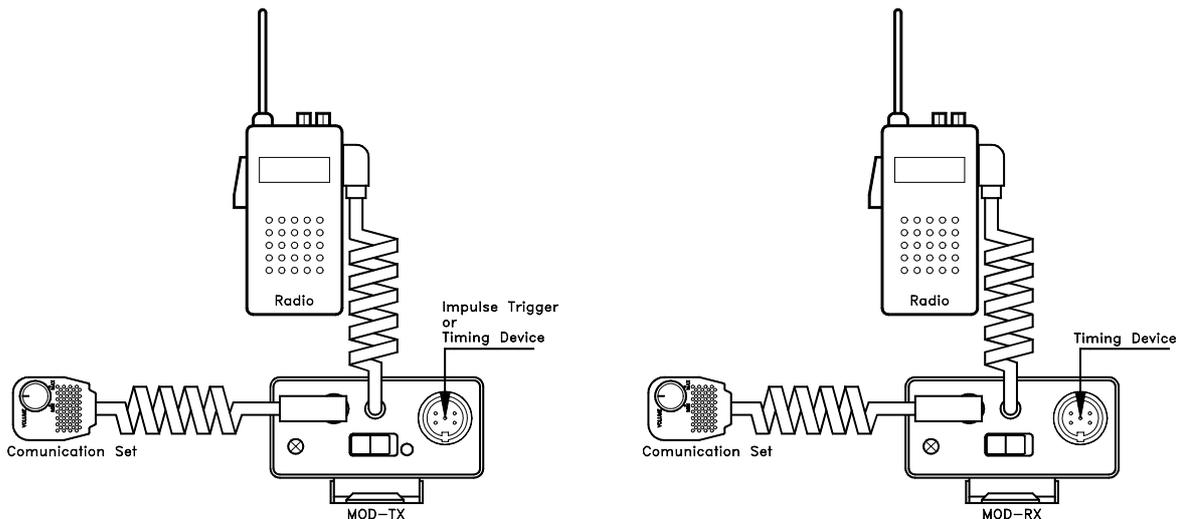
Radios that need a Communication Set:

There are radios (e.g. Kenwood) which need a speaking set, in order to work together with the ALGE MOD. The connection for such radios is through a combined speaker-microphone plug.

The MOD-TX and MOD-RX must be special adapted for such radios, and they get a fix installed cable to connect the radio (instead of socket 4 and 5). Additional has the MOD a double socket to plug the communication-set.



- Connect the communication-set at the MOD-TX and MOD-RX.
- Connect radio to cable outlet from MOD-TX and MOD-RX



3.3. Switching on:

Attention: If you connect the MOD-RX with cable 106-10 with the timer, you should not turn the device-switch (9) on, because otherwise it uses the supply of the internal battery. As soon as you plug the MOD-RX at the timer (timer must be switched on), it is functioning.

Normal Mode:

- Turn device-switch (9) on
- MOD works automatically in the impulse-transmission-mode 0.3 seconds.

Test-Mode:

- Press device-key (8) from MOD-TX for about one second
- The MOD-TX sends permanent data to the receiver
- The test-mode turns automatically off after 1 minute. Manual you can turn it off, by pressing the device-key (8).

Impulse Transmission 0.3 sec.: - Turn device-switch (9) on (LED (3) must blink)

Impulse Transmission 2 sec.:

- Press device-key (8) and keep it pressed
- Turn device-key (9) on (LED (3) must blink)
- Release device-key (8)

Data Transmission:

- Turn device-switch (9) on (LED (3) must blink)
- If the MOD receives a correct data string it, the MOD changes into the data transmission.

The following adjustments are important for the radio and MOD:

- Adjust for both radios the same frequency. Move the volume lever at least up to the middle position.
- Code-switch (13) must show the same figure for MOD-TX and MOD-RX.
Factory pre adjustment = 0

The impulse- and data transmission will not work, if you have the volume of the radio on minimum.

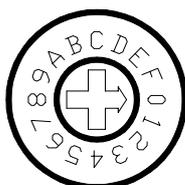
If you have no impulse or data transmission, you might have to readjust the level potentiometer (13).

3.4. Choosing the Operation Modes:

	Signal Mode		Data Mode	
	MOD-TX	MOD-RX	MOD-TX	MOD-RX
Device-Switch (8)	test	not used	test	not used
Code-Switch (12)	timing channel	not used	no function	not used
Code-Switch (13)	address	address	address	address

3.5. Address:

The code-switch (13) to address the MOD has 16 switch positions and is located in the battery compartment. Within a system all MOD-TX and MOD-RX need the same address.



Together with the MOD you will receive a small screwdriver. It is used to operate the code-switch (12) and (13). The arrow of the switch shows always the switch position. The factory adjustment is 0.

Code-Switch (13)	Address
switch position = 0	0
switch position = 1	1
switch position = 2	2
switch position = 3	3
switch position = 4	4
switch position = 5	5
switch position = 6	6
switch position = 7	7
switch position = 8	8
switch position = 9	9
switch position = A	A
switch position = B	B
switch position = C	C
switch position = D	D
switch position = E	E
switch position = F	F

If different ALGE MOD-systems are used in the same area with the same frequency, it is important that every system works on a different address. The address protects from wrong impulses or data, but other impulse or data strings can block the receiver.

If you want to prevent the blocking of the receiver through another system, it is necessary to use another frequency.

3.6. Best Set-Up Position for the Radio:

The position of the radios should be checked before the race. This means that you have to move the radio position, if you have no clear speech connection. If you have no clear speech connection, you will also have not a good transmission for impulses or data.

Move the radio and check the speech connection. Please notice, to use the radio during the race only in areas that work well during the test.

No persons should stand direct before the radio in the direct line from radio to radio.

3.7. Check the Frequency:

If the frequency is used by other persons as well, you should change to another frequency. If other people use your frequency you could loose impulses or data.

4. IMPULSE TRANSMISSION

The impulse transmission works direct form any ALGE-impulse trigger to ALGE timer by radio.

**Each impulse transmission through the MOD
has a constant delay of 0.300 seconds,
or 2.000 seconds
Minimum error: 0.001 second**

- If you transmit only the start impulse with the MOD you must add to each run time 0.3 or 2 seconds.
- If you transmit only the finish impulse with the MOD you must subtract from each run time 0.3 or 2 seconds.
- If you transmit the start- and finish impulse you get the exact run time.

The MOD-TX and MOD-RX is blocked after the beginning of the impulse for 0.3 or 2 seconds. This means each further impulse transmitted with MOD-TX is lost during this time.

Attention: During the transmission of an impulse you are not allowed to use the radios to speak. If you press the speech button of the receiver radio (connected to MOD-RX), then you can not receive any impulse at the same time.

Impulse Delay of 0.3 Seconds:

If the radio has not an automatic power-saving-mode you should use the impulse delay with 0.3 sec. for impulse transmission. Each impulse receives the timing device with a delay of 0.3 seconds.

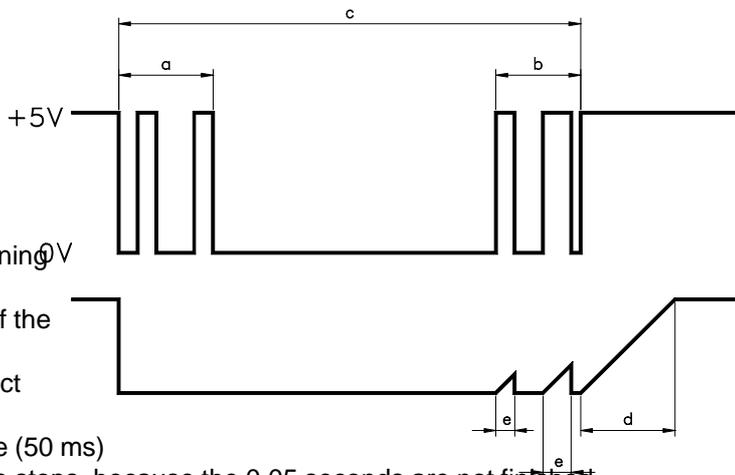
Impulse Delay of 2 Seconds:

If the radio has an automatic power-saving-mode you should use the impulse delay with 2 sec. for impulse transmission. Each impulse receives the timing device with a delay of 2 seconds. This mode is needed to turn the radios from the power-saving-mode back to the standard mode.

Double impulse protection:

The MOD-TX has a built in double impulse protection. This prevents double impulses made by a bad switch. The double impulse protection time is 0.05 seconds.

- a Contact triggering at the beginning of the impulse
- b Contact triggering at the end of the impulse
- c Duration of impulse plus contact triggering
- d Double impulse protection time (50 ms)
- e Double impulse protection time stops, because the 0.05 seconds are not finished



Checking the impulse transmission:

During the transmission of a timing impulse you can hear from the receiver speaker a beep.

Safety of an Impulse Transmission:

When you use the impulse transmission the MOD and radio replaces the cable between the impulse trigger and the timer. You must know, that radio is easy to disturb. This means that you do not receive a signal in case of a disturbance at the timer. When you use the radio to transmit the impulses you will never have the same safety as with wires.

The following ALGE devices you can use as impulse trigger:

- Startgate STScM1S
- Startgate STScM2S
- Startgate STScA1
- Startgate STSc3Q
- Photocell RLS1c
- Photocell RLS1cd
- Photocell RLS3c
- Startmicrophone SM7
- Startbeep STB1
- Startclock ASC1
- Handswitch 023-02 or 023-10
- Tapeswitch TS
- Touchpad TP24 or TP18

The following ALGE timer you can use as impulse receiver:

TdC 8000: Normally use the socket A or A' to connect cable 106-10. In special cases see the TdC 8000 manual for help.

TdC 4000: Plug cable 106-10 at one of the four sockets that say "ext. supply / lightbeam".

Timer S4: Normally use the socket A or A' to connect cable 106-10. In special cases see the Timer S4 manual for help.

Timer S3: Plug cable 106-10 at one of the four sockets that say "ext. supply / lightbeam".

Comet: Plug cable 106-10 at one of the photocell sockets.

Videotimer VT2: Plug cable 106-10 at one of the four sockets that say "ext. supply / lightbeam".

OPTI 1sw: Plug cable 106-10 at one of the four sockets that say "photocell". For the OPTI you have to know that you can transmit only start impulses. You cannot transmit the finish impulse, because the photocell does control the recording. With the MOD you would only record a small part of the finish arrival.

Selection of the Impulse Transmission:

With the MOD-TX you can transmit two impulse channels. Normally this will be the start- C0 and finish impulse C1 (use cable 106-10).

If you use additional with the MOD the RX-C10, than you can receive up to 10 different impulse channels with the TdC 8000 and Timer S4 (see page 17).

4.1. Impulse Transmission from a Startgate:

- Connect MOD-TX and Startgate with cable 110-10.
- Connect MOD-RX and ALGE timer with cable 106-10 (use socket A or A' for Timer S4 and TdC 8000).

4.2. Impulse Transmission from a Start-Photocell:

- The photocell RLS1c needs a internal supply.
- Connect MOD-TX and Start-Photocell RLS1c with cable 114-10.
- Connect MOD-RX and ALGE timer with cable 106-10 (use socket A or A' for Timer S4 and TdC 8000).

4.3. Impulse Transmission from a Finish-Photocell:

- The photocell RLS1c needs a internal supply.
- Connect MOD-TX and Finish-Photocell RLS1c with cable 115-10.
- Connect MOD-RX and ALGE timer with cable 106-10 (use socket A or A' for Timer S4 and TdC 8000).

4.4. Impulse Transmission from a Photocell used for Start and Finish:

- The photocell RLS1c needs a internal supply.
- Connect MOD-TX and photocell RLS1c with cable 115-10.
- Connect switch 077--5 at the timer (use socket A or A' for Timer S4 and TdC 8000).
- Connect MOD-RX with cable 106-10 at switch 077--5.

4.5. Impulse Transmission with one Photocell for Start and Finish:

- The photocells RLS1c need a internal supply.
- Connect adapter 018--5 at the MOD-TX.
- Connect Start-Photocell RLS1c with cable 114-10 at adapter 018--5.
- Connect Finish-Photocell RLS1c with cable 115-10 at adapter 018--5.
- Connect switch 077--5 at the timer (use socket A or A' for Timer S4 and TdC 8000).
- Connect MOD-RX with cable 106-10 at switch 077--5.

4.6. Impulse Transmission with one Photocell for Start and one for Finish:

- The photocells RLS1c need a internal supply.
- Connect Start-Photocell RLS1c with cable 114-10 at MOD-TX.
- Connect Finish-Photocell RLS1c with cable 115-10 at MOD-TX
- Connect switch 087--5 at the timer (use socket A or A´ for Timer S4 and TdC 8000).
- Connect MOD-RX with cable 106-10 at switch 087--5.

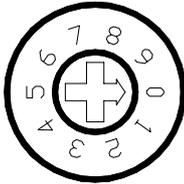
4.7. Impulse Transmission for more than two Timing Channels with RX-C10:

With the TdC 8000 and Timer S4 you can receive together with the RX-C10 from the MOD-RX up to 10 different timing channels. Therefore you need different MOD-TX. You can transmit a maximum of two timing channels per MOD-TX. At each MOD-TX you need to adjust the timing channels with code-switch (12).

You must notice, that each timing impulse blocks the transmitter and receiver for 0.3 (or 2) seconds. A further impulse from another transmitter will be ignored during this time.

Timing Channel selection with Code-Switch (12) at the MOD-TX:

You need to adjust the timing channel only at the MOD-TX (transmitter). Adjust the timing channels with code-switch (12). Each switch position has two timing channels.



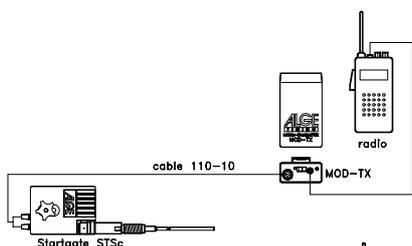
Set the switch with the small screw driver delivered together with the MOD. The switch position is shown with the arrow. The ALGE setup is always on position 0 (e.g. picture to the left).

MOD-TX Code-Switch (12)	MOD-TX DIN-Socket (6) on Pin 1	MOD-TX DIN-Socket (6) on Pin 2
switch position = 0	0	1
switch position = 1	1	2
switch position = 2	2	3
switch position = 3	3	4
switch position = 4	4	5
switch position = 5	5	6
switch position = 6	6	7
switch position = 7	7	8
switch position = 8	8	9
switch position = 9	0	2

e.g.: Timing with 10 timing channels on test slope for skiing:

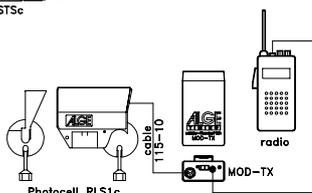
- A separate MOD-TX is used for each timing channel (all together 10 MOD-TX).
- A Startgate is used for the start.
- A photocell RLS1c with internal supply is used for the intermediate times and the finish.
- A TdC 8000 is used as timer
- Connect the RX-C10 at the TdC 8000 (connection "Multi Channel") and MOD-RX.

Channel	Function	Impulse Trigger	Switch Position Code-Switch (12)	Cable Type	Socket of MOD-TX
C0	Start	startgate	0	110-10	DIN-socket (6)
C2	intermediate time1	photocell	1	001-10	DIN-socket (6)
C3	intermediate time2	photocell	2	001-10	DIN-socket (6)
C4	intermediate time3	photocell	3	001-10	DIN-socket (6)
C5	intermediate time4	photocell	4	001-10	DIN-socket (6)
C6	intermediate time5	photocell	5	001-10	DIN-socket (6)
C7	intermediate time6	photocell	6	001-10	DIN-socket (6)
C8	intermediate time7	photocell	7	001-10	DIN-socket (6)
C9	intermediate time8	photocell	8	001-10	DIN-socket (6)
C1	finish	photocell	0	001-10	DIN-socket (6)



START

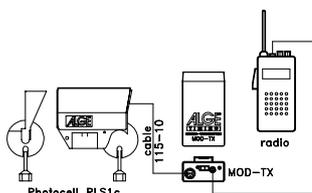
MOD-TX with channel 0
Code-Switch (12) on 0



Intermediate Time 1

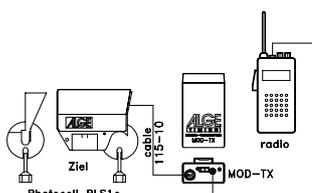
MOD-TX with channel 2
Code-Switch (12) on 1

etc.



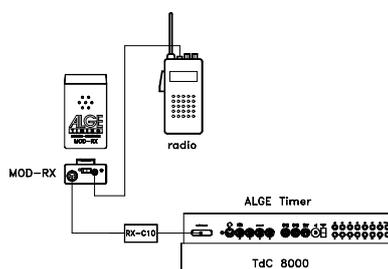
Intermediate Time 8

MOD-TX with channel 9
Code-Switch (12) on 8



FINISH

MOD-TX with channel 1
Code-Switch (12) on 0



5. DATA TRANSMISSION

For what can you use the data transmission:

- data transmission from a Timer S4 to another Timer S4 (Program 0)
- data transmission from a ALGE timer to a Printer P4A
- data transmission from a ALGE timer to a PC

Function:

The transmission of each data string needs one second.

If the MOD-TX receives a correct data protocol, it switches from impulse- to data transmission. Each data transmission is done 10 times with a check sum. As soon as the MOD-RX receives once the correct string with a correct check sum it does output the data string.

Repeat Data Transmission:

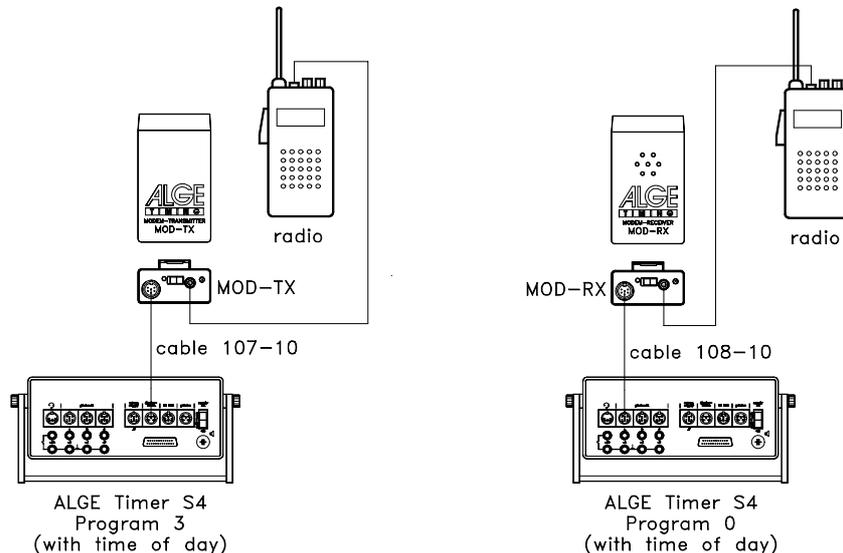
If you did not receive the last data string at the receiver, it is possible to repeat the data. The last data string is always stored at the MOD-TX. Press device-key (8) of the MOD-TX to send the data string again.

Important: If the timer sends continuously data (e.g. for a display board), than data will be partly not transmitted, due to the slow transmission rate. Radios are not made for constant data transmission. They get very fast hot and empty. For such a use you must work with the ALGE Teledata TED.

5.1. Data Transmission form Timer S4 to Timer S4:

The Timer S4 can supply the MOD-TX and MOD-RX from the serial interface:

- Connect MOD-TX and Timer S4 with cable 107-10.
- Connect MOD-RX and Timer S4 with cable 108-10.



Data transmission of a start time from a synchronized Timer S4 to another Timer S4.

- Use Program 3 for the Timer S4 at the start. You must input the timer of day:
 - > press yellow and red bottom at the same time
 - > the display shows "HP 0:00:00"
 - > Input the hours with the red button
 - > Input the minutes with the yellow button
- Use program 0 for the Timer S4 at the finish: You must input the time of day:
 - > press yellow and red bottom at the same time
 - > press again yellow and red bottom at the same time
 - > the display shows "SY 0:00:00"
 - > Input the hours with the red button
 - > Input the minutes with the yellow button
 - > Adjust the baud rate of the RS 232 interface of the Timer S4 to 2400 Baud (transmit Hex. code 8A from a PC to Timer S4)
- Synchronize both Timer S4 with a start cable (channel 0)
- The display of the finish Timer shows the time of day
- Press yellow and red bottom at the same time to clear the display
- Program 0 works now as described in the S4 manual
- Carry the start Timer S4 to the start.

Repeat Data Transmission:

If you do not receive the start time at the finish timer, you can repeat the data transmission:

- press device-key (10) at MOD-TX

5.2. Data Transmission from a ALGE Timer to Printer P4A:

The data transmission from the timer to the printer can be made by radio. Therefore you can e.g. connect a second printer for the speaker.

If you use socket "display board" you need to use cable 107-10 between the timing device and MOD-TX.

Attention: You must not transmit the running time. Use the display board channel for run times.

5.3. Data Transmission from a ALGE Timer to PC:

The timer can transmit the data from the interface "display board" through the MOD and radio to a PC.

Attention: You must not transmit the running time. Use the display board channel for run times.

6. TECHNICAL DATA

Impulse Input TED-TX: active low, min. 10 ms, double impulse protection time about 50 ms

Impulse Output TED-RX: active low, 100 ms

Power Supply: external: MOD-TX and MOD-RX: +6,5 to 28 Volt DC
internal: 9 Volt Alkaline Battery

Power Consumption: MOD-TX: in Transmission Mode: about x mA
in Stand-by Mode: about x mA
MOD-RX: in Receiving Mode: about x mA
in Stand-by Mode: about x mA

Working Time: Table for use with a 9 Volt Alkaline Batteries at 25°C (77F) with one impulse per minute:
MOD-TX about 140 hours
MOD-RX about 40 hours

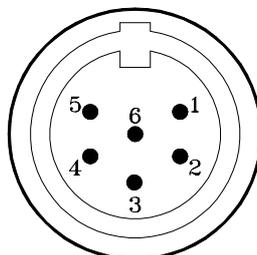
RS-232c Interface (for MOD-TX and MOD-RX):

Input-/Output format: 1 Start Bit, 8 ASCII Bit, no Parity-Bit, 1 Stop Bit
Transfer Speed: 2400 Baud
Pin Connection: see below

Connections:

TED-TX DIN socket:

- 1 Impulse input (Start)
- 2 Impulse input (Stop)
- 3 Ground
- 4 Input , external supply
- 5 Output +5 Volt stabilized
- 6 Data input



TED-RX DIN socket:

- 1 Impulse output (Start)
- 2 Impulse output (Stop)
- 3 Ground
- 4 Input, external supply
- 5 empty
- 6 Data output

Working Temperature range: -20 to +50°C (-4 to 122 F)

Weight: without batteries: with batteries:
MOD-TX and MOD-RX each about 150 g each about 200 g

Measurements: about 120 x 70 x 40 mm (L x W x H) for MOD-TX and MOD-RX

