Keypad
CT2000

Art. No.: 460001, 460005 (black)
Art. No.: 460007, 460014 (white)

Installation Manual

EN 50151-3, Security grade 3, Environmental class 2, Skafor 3

CE

CT2000_installation_ENGnov18

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1. Introduction

CT2000 is a advanced keypad manufactured in Denmark. It can be used as stand alone keypad and as a part of a larger system. The keypad has the following features:

- Easy to use.
- Waterproof.
- No mechanical switches - durable.
- Precautions against code guessing:
    - The keypad blocks after 4 invalid codes for a period of up to 255 seonds.
- 100 different user codes.
- 1 Master Code and 1 Service Code.
- All codes can be programmed with 1 to 8 digits.
- Programmable LED’s.
- Several output possibilities (advanced RS485 communication).
- Outout can be programmed as *timer* or on/off (toggle).
- Possibility of connection for log printing.
- Stand alone, no accessories needed.

Typical applications:

- As a simple access control system monitoring the electric lock of a single door.
- As a remote keypad in a intrusion alarm system.
- As an access control system.
- As a time registration equipment.
- To turn safety equipment on and off.
- As a remote system managed over WAN/LAN.
- Can be programmed as stand alone and by the software Conlan eXPress (see page 26 - 27).
- Optionally the LED (red and green) can be activated by extra wires (see page 14) Art. No.: 460070 and 460071.

2. Programming

Programming of the keypad is done by changing the value of one or more of the 118 different positions. Each of the positions numbered 00 to 102 can contain a code consisting of 1 to 8 digits. The rest of the positions controls how the keypad works.

> **Notice:**The keypad is different from other keypads on the market.
> It has no mechanical keys, but is operated just by touching the keys.
> **Pay special attention to the yellow LED.** The LED flashes every time the keypad has registered that you have touched a key.

To programme the keypad, please do as follows:

1. Connect the supply voltage to the keypad. After the connection you have one chance to key in the Service Code followed by a touch on the **< # >** key.
2. Key in the Service Code **< 12347890 >** followed by a touch on the **< # >** key (notice that the Service Code does not contain the digits **5** and **6**).
3. If you key in the wrong Service Code, you have to start over again from 1.

Pay special attention to the LED's after each touch.

- **Green** LED on, indicates that the keypad is in programming mode.
- **Yellow and green** LED on at the same time, indicates that there has been keyed in a position number followed by a touch on the **< # >** key.
- Yellow LED on alone, indicates that the keypad har recieved the value for the first time, and that it has been followed by a touch on the **< # >** key.
- After the value has been confirmed by another typing of the same code, followed by a touch on the **< # >** key, the yellow LED will be off, and the green LED will be on again.
- To leave the programming mode, push the **< # >** key again. Now the yellow LED will indicate normal operation (default programming).

2.1 Minimum programming

CT2000 can be programmed for a variety of different things. If you simply must have the keypad to function with factory programming - its the programming options that suits most applications - do as follows:

Changing Service Code
The Service Code, which is factory set to **12347890** should be changed so that unauthorized persons can not gain access to change the keypads setup. The Service Code is on position 101- see page 13 *Programming positions* to change the Service Code.

Program Master Code
This is only required if the user should be able to program, change or delete codes. The Master Code has no value at the factory, but must be in position 100 - see page 13 *Programming positions* to program the Master Code.

Switching output function and/or time
CT2000's open collector output is factory set to provide a 0V DC from it on the positions 110 - 122 programmed time (e.g. in 5 seconds). The open collector outputs functions is programmed in position 103 and is factory set to the value 1, which corresponds to the above 0V DC whenever you enter the correct code on the keypad. Change this value to 2 reversed the the open collector output, providing 12/24V DC when properly entered code.

Switching LED settings
CT2000's LED settings change on position 105. See table on page 11 for choice of setting. See page 13 *Programming positions* to program the position.

Performes the minimum programming above, Can the CT2000 keypad immedially be used.

Positions:

Position:	**Controls:**
00 - 99	User codes (1 - 8 digits)
100	Master Code (1 - 8 digits)
101	Service Code (1 - 8 digits (factory default **12347890**))
102	ID number
103	Output selection (*slave, timer function, reversed timer function*).
104	Blocking time in case of code guessing (0 - 255 seconds)
105	LED's functions and indications.
106	Master programming level.
110	Output time for user code 00 - 07
111	Output time for user code 08 - 15
112	Output time for user code 16 - 23
113	Output time for user code 24 - 31
114	Output time for user code 32 - 39
115	Output time for user code 40 - 47
116	Output time for user code 48 - 55
117	Output time for user code 56 - 63
118	Output time for user code 64 - 71
119	Output time for user code 72 - 79
120	Output time for user code 80 - 87
121	Output time for user code 88 - 95
122	Output time for user code 96 - 99

Default programming = factory set:

Position	**Code**	**Group**
00	1234	0
101	12347890	

Position	**Value**	**Means:**
102	1	ID number 1
103	1	Stand alone and timer function on transistor output.
104	5	5 seconds.
105	0	Yellow LED on standby and green LED on when keypad is activated.
106	100	Master can change user codes on positions 00 to 99.
110 - 122	5	Open collector output activated in 5 seconds

All other positions are "empty" when the keypad leaves the factory.

2.2 Master Code (100)

The Master Code is a limited version of the Service Code. It is only authorized to change the values on positions 00 - 99. That means change user codes. The code can be used by the person that is taking care of the daily operation of the system.
The Master Code has position 100, but it is empty when the keypad leaves the factory.
The Master Code can only program, change or delete user codes. It can not activate the open collector output.

2.3 Service Code (101)

The Service Code is used to put the keypad into programming mode. The code gives access to change user codes and Master Code and to change the function on the keypad.
The Service Code has position 101, and the values is, when the keypad leaves the factory set to **12347890** (notice that the Service Code does not contain the digits 5 and 6).
The Service Code can only change the function of the keypad, but can not activate the open collector output.

This code is only valid immediatly after, the supply voltage has been connected!

This is done to optain a maximum safety against sabotage to the keypad.

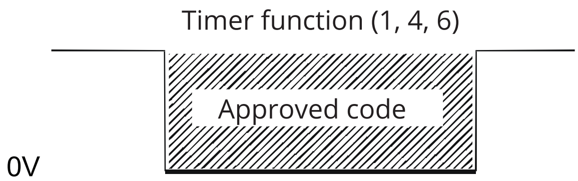
2.4 ID number (102)

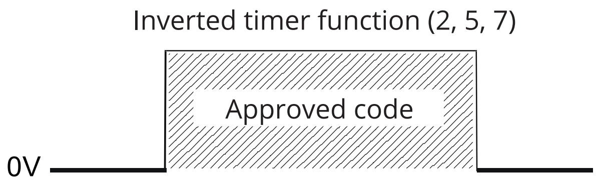
This position can contain a value between 1 and 255. The value indicates which ID number the keypad has (if it is a part of a larger system). You have the opportunity to control up to 255 keypads on the same data-bus.
The value on position number 102 is 1 when the keypad leaves the factory (ID number 1).

2.5 Output choice (103)

The value on this position decides how the keypad reacts when typing a user code.

Value:	**Function:**
0	(Not used)
1	Output **active** *timer time*
2	Inverted output
3	(Not used)
4	Rolling code, 4 digits
5	Rolling kode, 4 digits, inverted output
6	Rolling code, 6 digits
7	Rolling code, 6 digits, inverted output
8	(Not used)
9	Ask for output status





Function 0 **Not used.**

Function 1 **Output active in** timer time.
Function 1 activates the keypad open collector output with a 0 VDC in accordance with the programmed time (position 110 - 122, for example for 5 seconds).

Function 2 **Inverted output.**
Function 2, <u>removes</u> 0 VDC from the keypads open collector output in accordance with the programmed time (position 110 - 122 in for example 5 seconds).

Funktion 3 **Not used.**

Function 4	**Rolling code, 4 digits.** Function 4, select a option where the keypad accepts a 4 digit code without subsequent use of the **< # >**. The code is approved, so even though it is in the middle in a longer entry sequence. Is the correct code example in 1234 and entered the 347123487, approves the code. Is the correct code not entered within 16 entries, will the keypad automatically reset after 10 seconds - indicated by a flash from the red LED. By the 16th entry will the keypad be blocked for at time equal to the curfew in the position 104. Upon entering the 4 digit code with pending reset (10 seconds) the keypad will block after entering 4 wrong 4-digit codes. To get in the master programming must ther be entered 4 times on the < # > key. The first 3 times , the red LED flashing. By the 4th entry will the LED stop flashing, indicating that the Master Code is ready for input. After the 5th key of **< # >** is it no longer possible to record the Master Code. If the Master Code is not entered within 65 seconds turns function 4. Completes the Master Code not with **< # >** turns function 4 after 10 seconds. Then can the keypad again be set to master programming, as described above.
Function 5	**Rolling code, 4 digits, inverted output.** Like function 4, but with inverted output.
Function 6	**Rolling code, 6 digits.** Function 6, select a option where the keypad accepts a 6-digits code without using < # >. There is still blocking after code guessing. The keypad is locked after 24 incorrect entries (digits). The blockade may be previousle set from 1 second to 9 minutes. See description under function 4.
Function 7	**Rolling code, 6 digits, inverted output.** Like function 6, but with inverted output.
Function 8	**Not used.**

Function 9 **Ask for output status.**

Function 9 will by entering a code followed by < # > show status at the output of a number of seconds, after which indication is turned off. The number of seconds can be set from 1 - 30 from position 122. During the status display, it is possible to change the status by typing the < 🔔 > key. The change of status is indicated by green respectively red LED in 9 seconds (green = active, red = inactive). Status can only change once per. code approved. The factory setting is 1.

2.6 Blocking time (104)

If someone is trying to guess a code, the keypad wil, after 4 invalid codes, be blocked for a period of time. During this period of tmie the red LED will flash to indicate that the keypad is blocked and no typing is possible. The value of this position decides how long the keypad will be blocked if someone tries to guess a code.

The value is 5 (5 seconds) when the keypad leaves the factory.

2. LED indications (105)

It is possible to control how the 3 LED’s on the top of the keypad should react in your specific installation.

Standby refers to which LED that will illuminate when the keypad is in standby mode and ready to be keyed on (yellow LED is the default value).

Aktiveret refers to which LED that will illuminate when the keypad is activated when typing on it (green LED flashes when typing a correct user code).

LED’er refers to how the LED will illuminate. In case of value 8 - 15, the LED for activated will illuminate for a period of ½ second, and then the LED will go back to normal again (no matter if the output still is activated or not).

Value	**Standby**		**Activated**		**LED’s**
0	yellow		yellow	green	Constantly
1	yellow		yellow	red	Constantly
2	yellow	red	yellow	green	Constantly
3	yellow	green	yellow	red	Constantly
4				green	Constantly
5				red	Constantly
6		red		green	Constantly
7		green		red	Constantly
8	yellow		yellow	green	Pulse (½ second)
9	yellow		yellow	red	Pulse (½ second)
10	yellow	red	yellow	green	Pulse (½ second)
11	yellow	green	yellow	red	Pulse (½ second)
12				green	Pulse (½ second)
13				red	Pulse (½ second)
14		red		green	Pulse (½ second)
15		green		red	Pulse (½ second)

The value of position 105 is 0 (yellow LED on at standby and green on when activated) when the keypad leaves the factory.

2.8 Output time for user codes (110 - 122)

The numbers in the positions 110 - 122 determines how long the open collector output on the keypad should be activated when a valid code is entered.
On each of the 13 positions can be entered a number between 0 - 255.
The numbers in all 13 positions is factory set to 5, means 5 seconds. If position 103 is programmed to 9, can group 13 (position 122) not be used.

See the table for a precise view of values versus hours, minutes and seconds on the back of the manual.

It is not possible for each code to have its own activation time. The user are therefore divided into 12 groups of 8 positions on each plus an extra group with 4 positions. Each position contain a user code. The values of positions 00 - 07 is named group 0.

If you key in one of the codes in position 00 - 07, the value in position 110 (group 0) desides the period time the open collector output is to be activated.

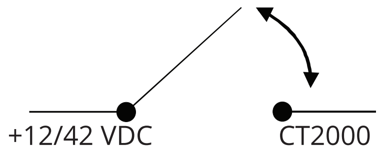
2.9 Reset

By connecting the supply voltage, key in the Service Code (within 10 seconds), followed by **< # >**, **< 250 >** and **< # >**, returns the CT2000 back to factory default as described in section 2 page 4.

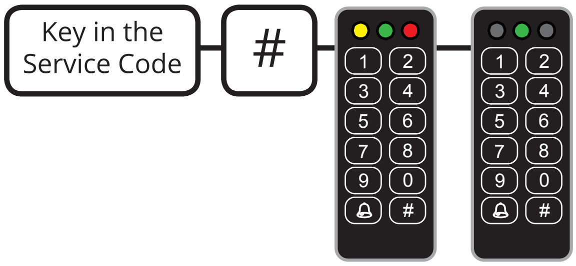
2.10 Positions

2.10.1 Programming positions

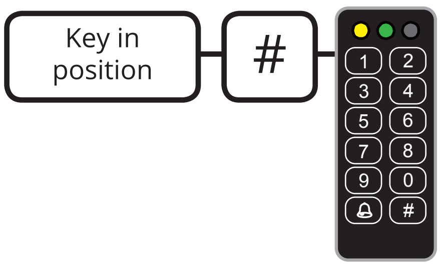
1. Disconnect the supply voltage to the keypad (for approx. 2 seconds) and connect it again to put the keypad into programming mode.



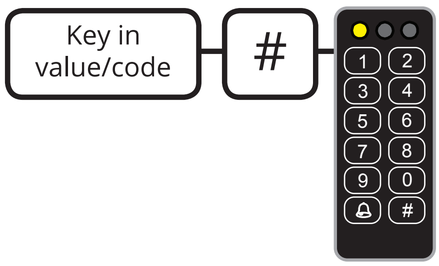
2. Key in the Service Code, followed by a touch on the **< # >** key. All 3 LED's will flash, and shortly after the green LED will illuminate.



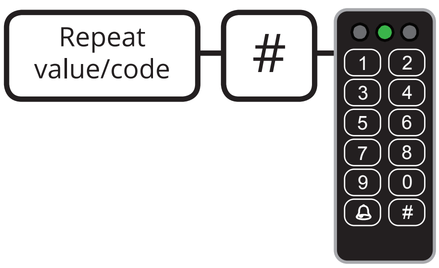
3. Key in a position number followed by a touch on the **< # >** key. Now the yellow and the green LED will stay illuminated.



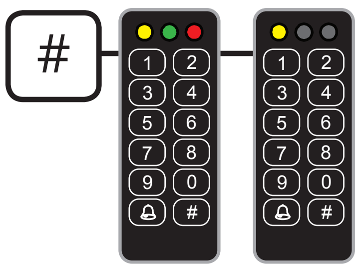
4. Key i a value or a code followed by a touch on the **< # >** key. The green LED will go off and the yellow LED will stay illuminated.



5. Repaet the value followed by a touch on the **< # >** key. If anything went wrong the red LED will flash and you have to start over again from point 3. I f the key in was accepted the green LED will illuminated again. The value is now programmed.

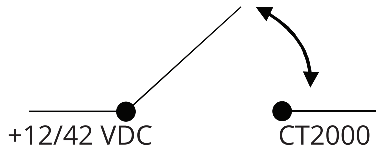


6. Key in **< # >** if you want to leave the program-ming mode. All 3 LED's will then illuminate shortly and the LED indicating the normal operating will illuminate (the yellow LED if the keypad has it's default programming.

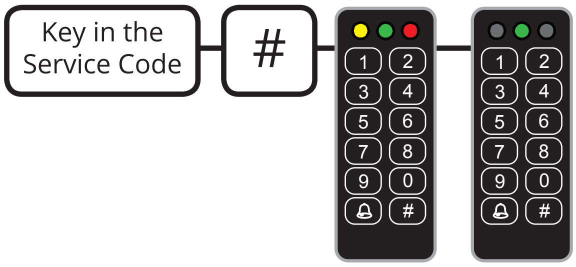


2.10.2 Changing positions

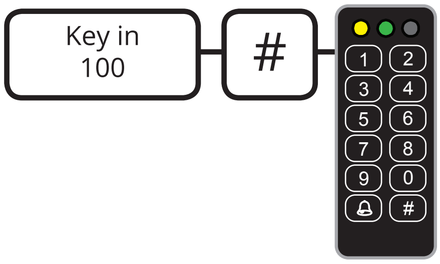
1. Disconnect the supply voltage to the keypad (for approx. 2 seconds) and connect it again to put the keypad into programming mode.



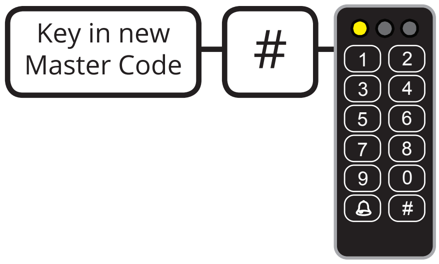
2. Key in the Service Code, followed by a touch on the **< # >** key. All 3 LED's will flash, and shortly after the green LED will illuminate.



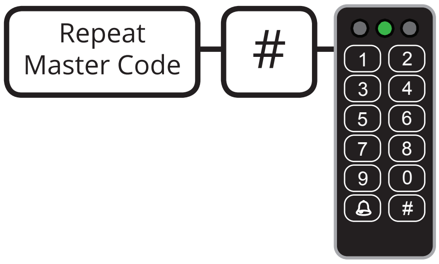
3. Key in e.g. 100 (Master Code) followed by a touch on the **< # >** key. Now the yellow and the green LED will illuminate.



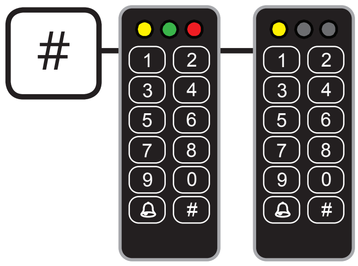
4. Key in a new Master Code followed by a touch on the **< # >** key. The green LED will go off and the yellow LED will stay illuminated.



5. Repeat the Master Code followed by a touch on the **< # >** key. If anything went wrong the red LED will flash and you have to start over again from point 3. I f the key in was accepted the green LED will illuminated again. The value is now programmed.

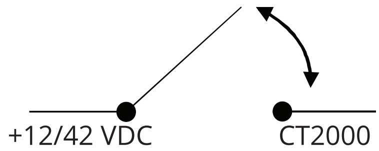


6. Key in **< # >** if you want to leave the programming mode. All 3 LED's will then illuminate shortly and the LED indicating the normal operating will illuminate (the yellow LED if the keypad has it's default programming.

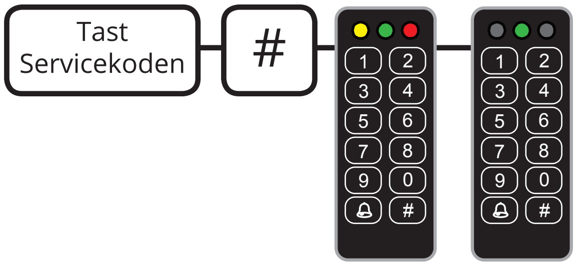


2.10.3 Deleting positions

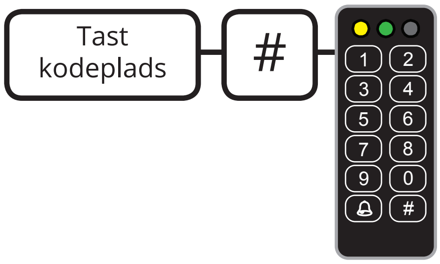
1. Disconnect the supply voltage to the keypad (for approx. 2 seconds) and connect it again to put the keypad into programming mode.



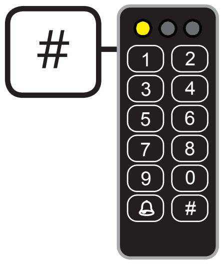
2. Key in the Service Code, followed by a touch on the **< # >** key. All 3 LED’s will flash, and shortly after the green LED will illuminate.



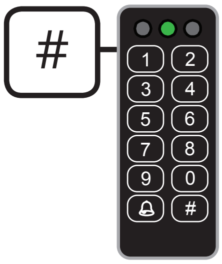
3. Key in the position you want to delete, followed by a touch on the **< # >** key. Now the yellow and the green LED will illuminate.



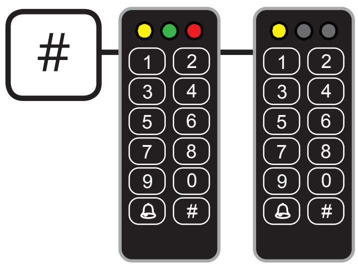
4. Key in **< # >** (equals programming “nothing” into the position). The green LED will go of and the yellow LED will stay illuminated.



5. Repeat the touch on the **< # >** key (equals repeating programming “nothing” into the position). The green LED will illuminate. The value/code is now deleted.



6. Key in **< # >** if you want to leave the programming mode. All 3 LED’s will then illuminate shortly and the LED indicating the normal operating will illuminate (the yellow LED if the keypad has it’s default programming.



3. Mechanical mounting

CT2000 must be mounted on a proper surface. By means of the included drill gauge, the holes for the four screws and the hole for the mounting cable are marked. **If the surface is not completely proper, avoid twist or bending the keypad while mounting!**

Figure 3 shows the mounting, as side view. Four screws must be used. **The tamper protection is a core (the white and the green) going through the keypad. Therefore make sure that the cable is secured properly inside the wall.**

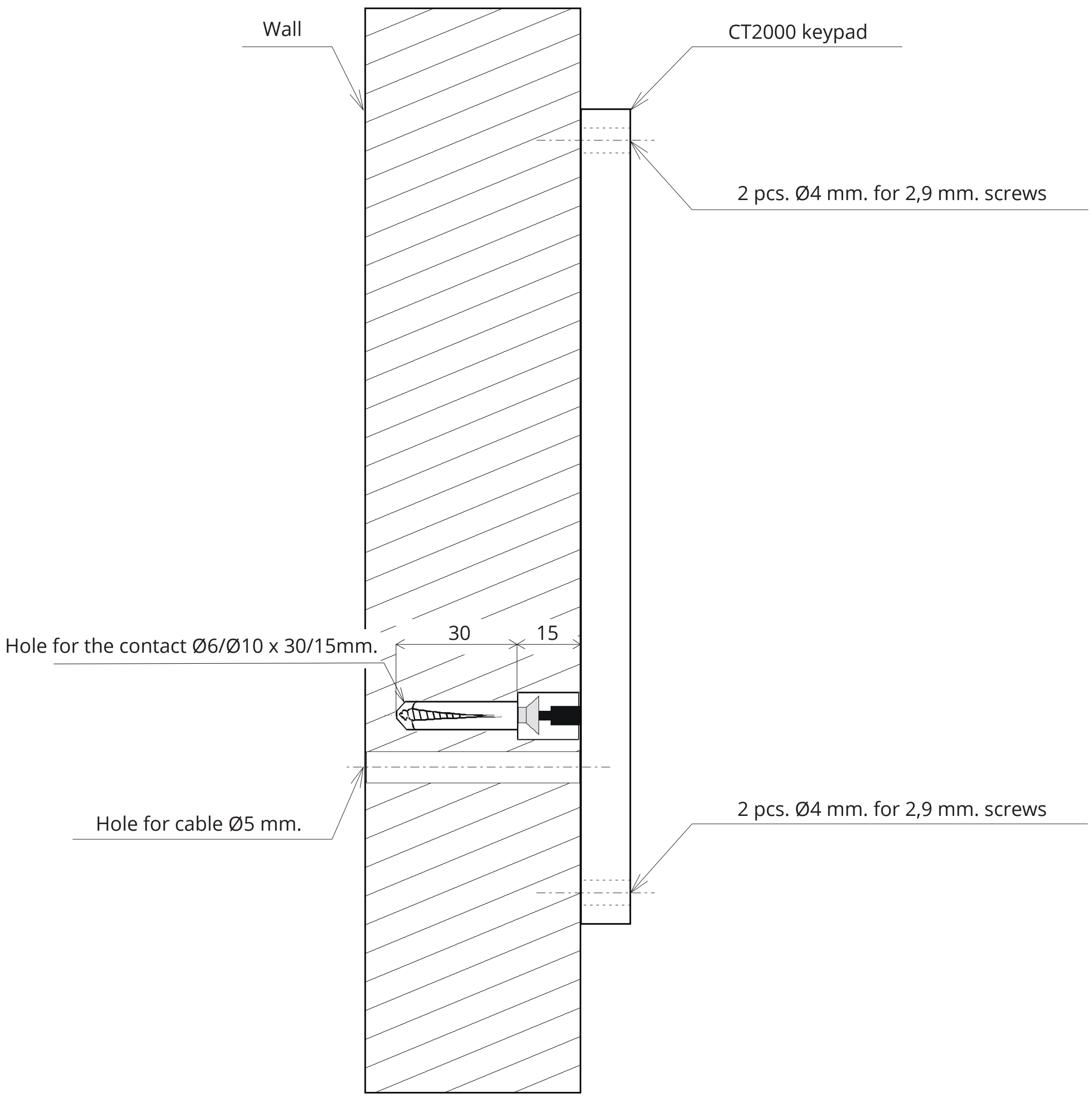


Figure 3: Side view

4. Electrical connection

The keypad CT2000 has 4 meters of 8/12 core cable mounted. The following shows how the keypad is to be connected

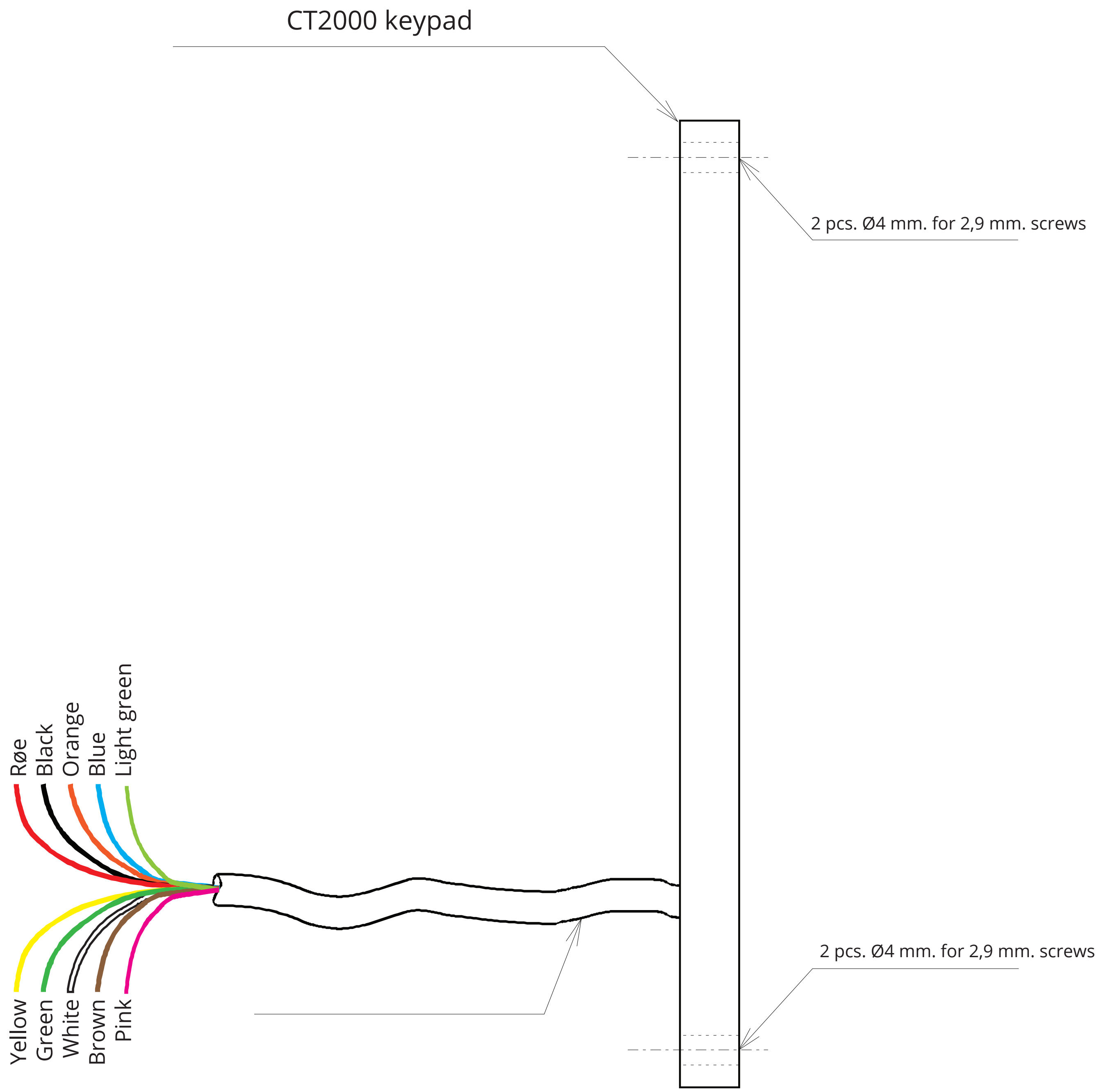
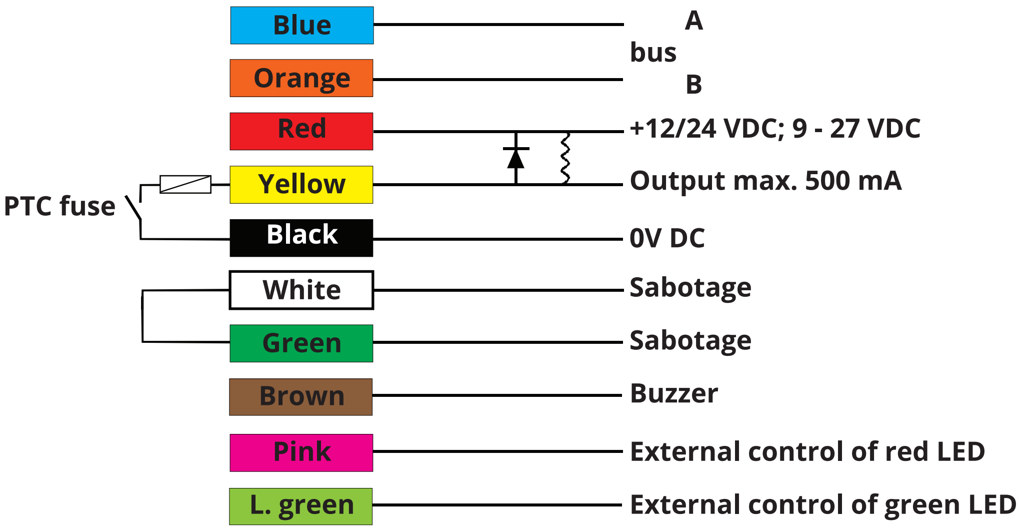


Figure 4

Color scheme



The yellow core is the open collector, <u>which gives a 0 VDC</u>!

CT2000 can be connected to 9 - 27 VDC.

For connection to an electric lock - use figure 5.

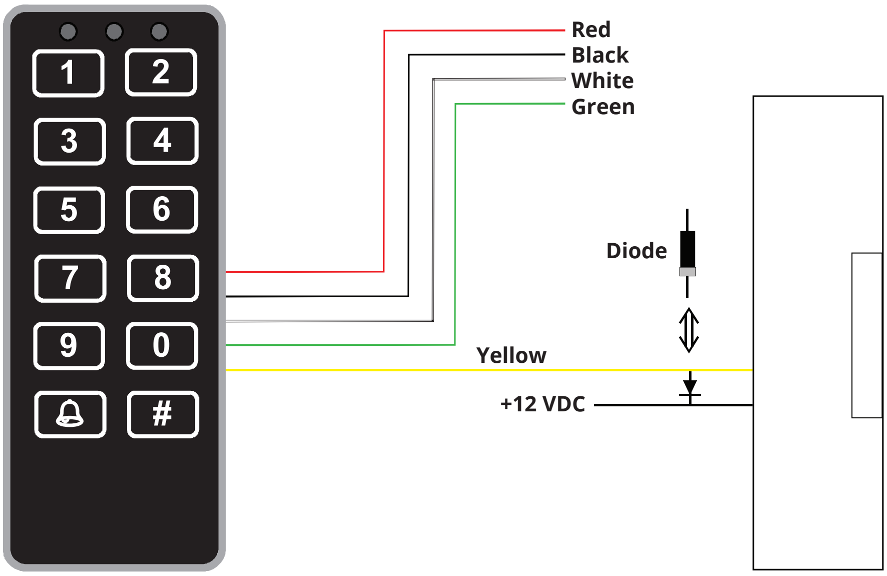


Figure 5: Connection to an electric lock

For connection to an electric lock that uses more than 500 mA - use figure 6.

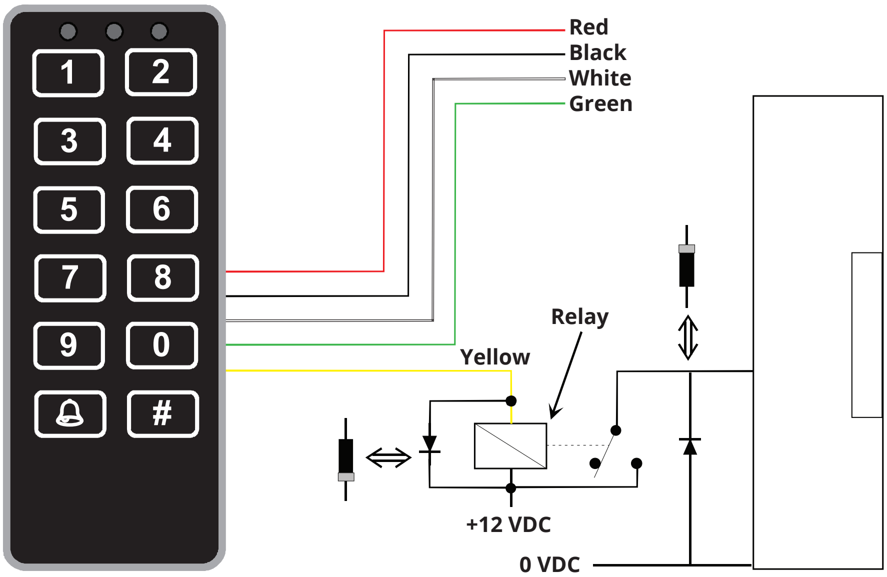


Figure 6: Connection to an electric lock by means of a relay.

For connection to a relay - use figure 7.

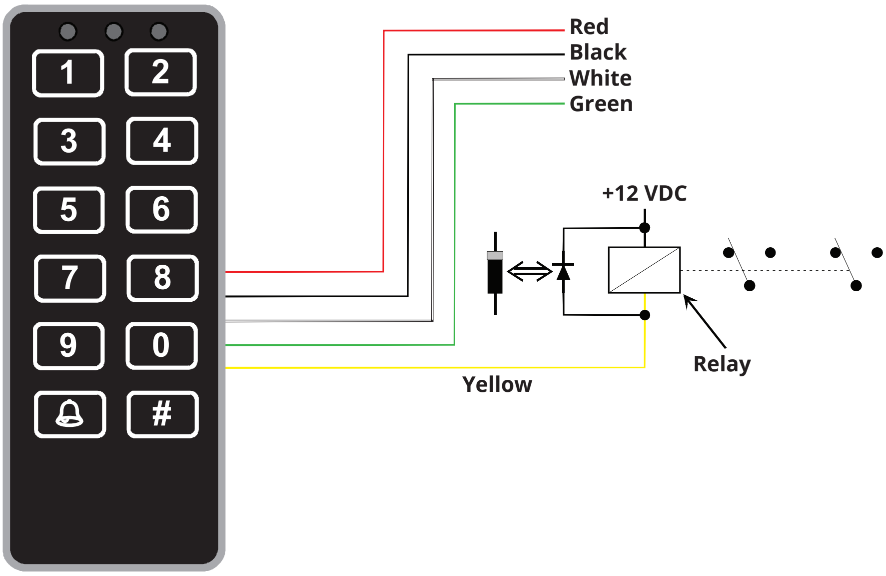


Figure 6: Connection to a relay for general purposes.

The CT2000 can be connected to a assembly box (CVT3). Please consult the manual for CVT3 for further information (Art. No.: 460089 - see figure 8).

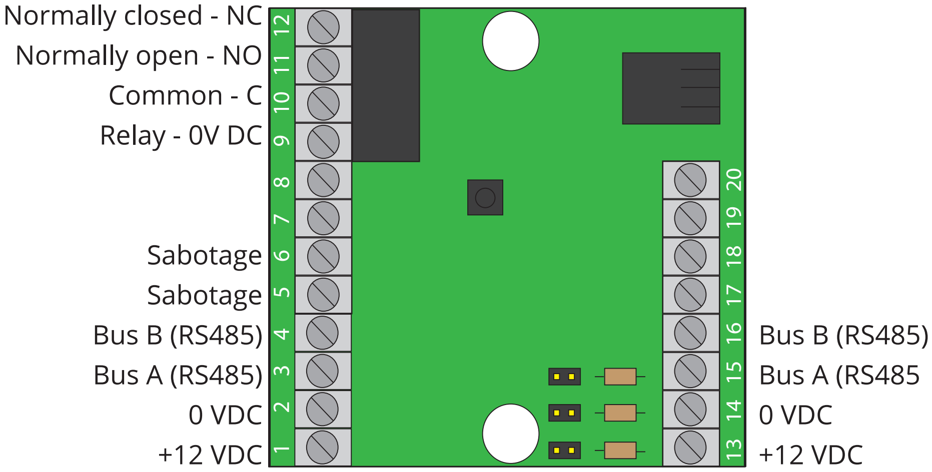
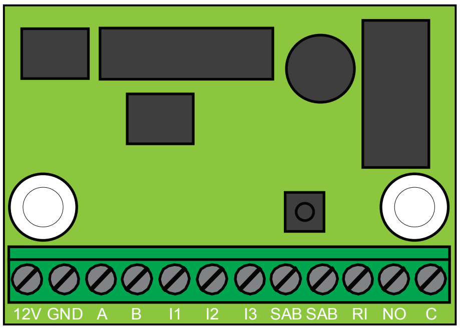


Figure 8: CVT3

The CT2000 can also be connected to data-bus (Box 485-T). Please consult the manual for Box 485-T for further informations (Art. No.: 460004 - see figure 9).



Figur 9: Box 485-T

The 2000 system can be controlled by a local network or the internet with the LANbox (Art. No.: 460018 - see figur 10), for a more flexible management of the 2000 system.

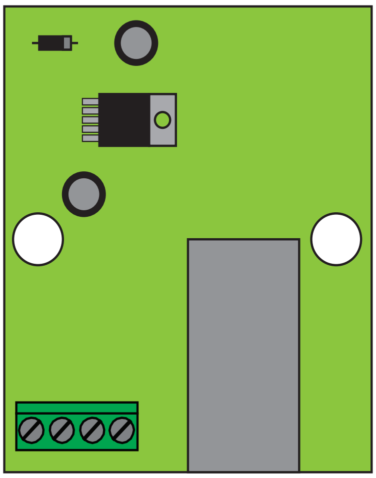
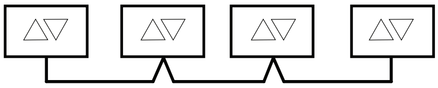


Figure 10: LANbox

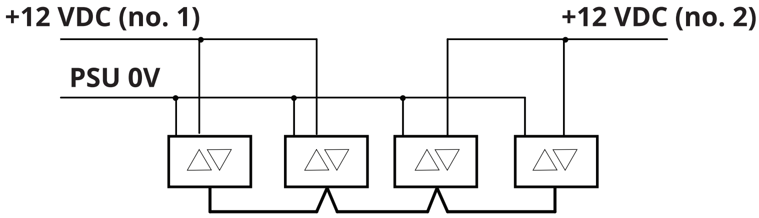
5. RS485 Communication

The whole 2000 system, inclusive CT2000 us the RS485 communication between the various units.



If the various units in the 2000 system each have their 12V DC power supply (230V AC connected to different phases), there may be a larger voltage difference between the devices, and RS485 circuits can be destroyed. To prevent this, it is nessesary to make sure that the devices have the same potential.

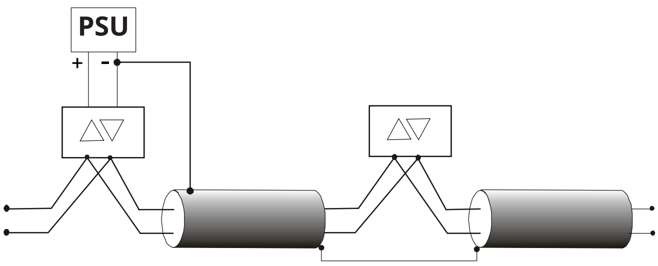
Ths is typically done by stopping the supply unit ÷ (DC negative) to each other. If there is a common power supply for all devices, this is done automatically.



5.1 Shielded cable

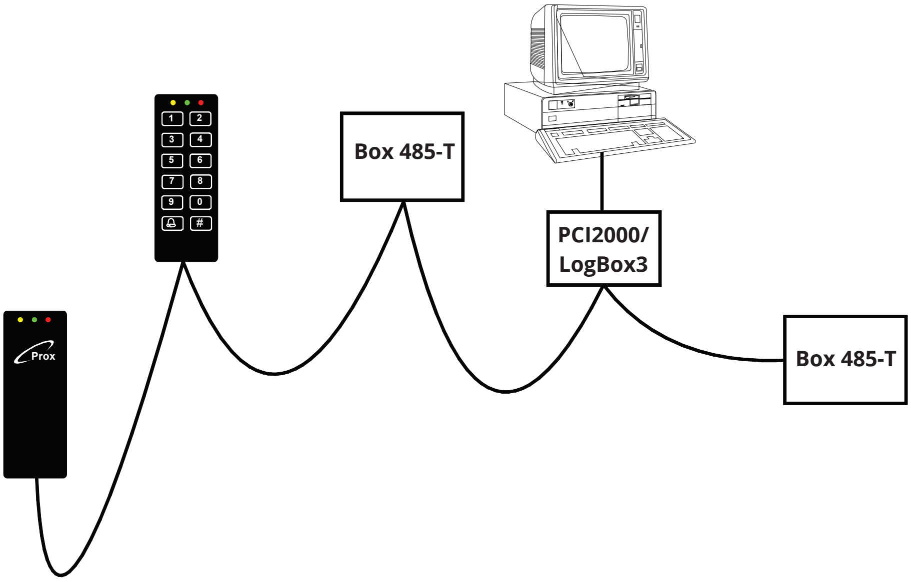
Twisted pair cables provide the protection against “common mode” nois pulses. But if there is much noise in the area you are in, or if the system you use is very sensitive to noise, it is advantageous to use shielded cable.

If there is a common power supply for all devices, the monitor would be connected throughout the length of the cable.



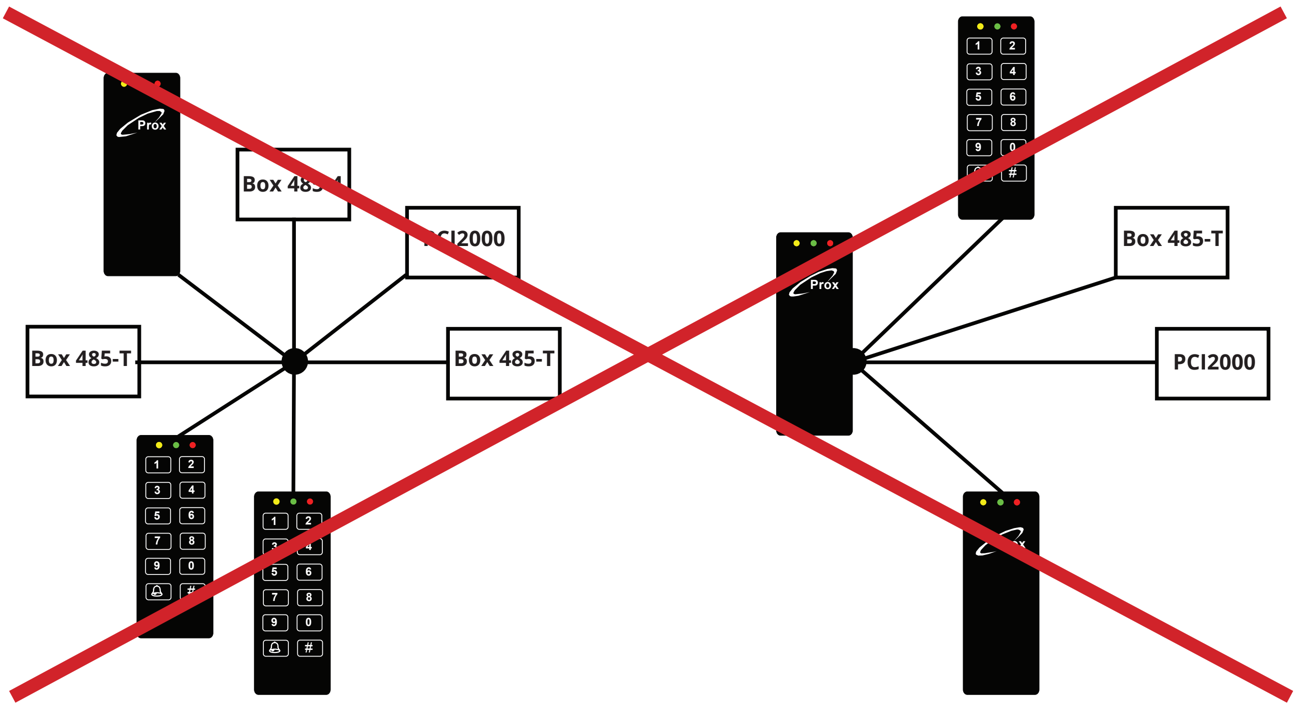
5.2 Wired method

When the devices are connected physically, it must be like pearls on string (see drawing below).

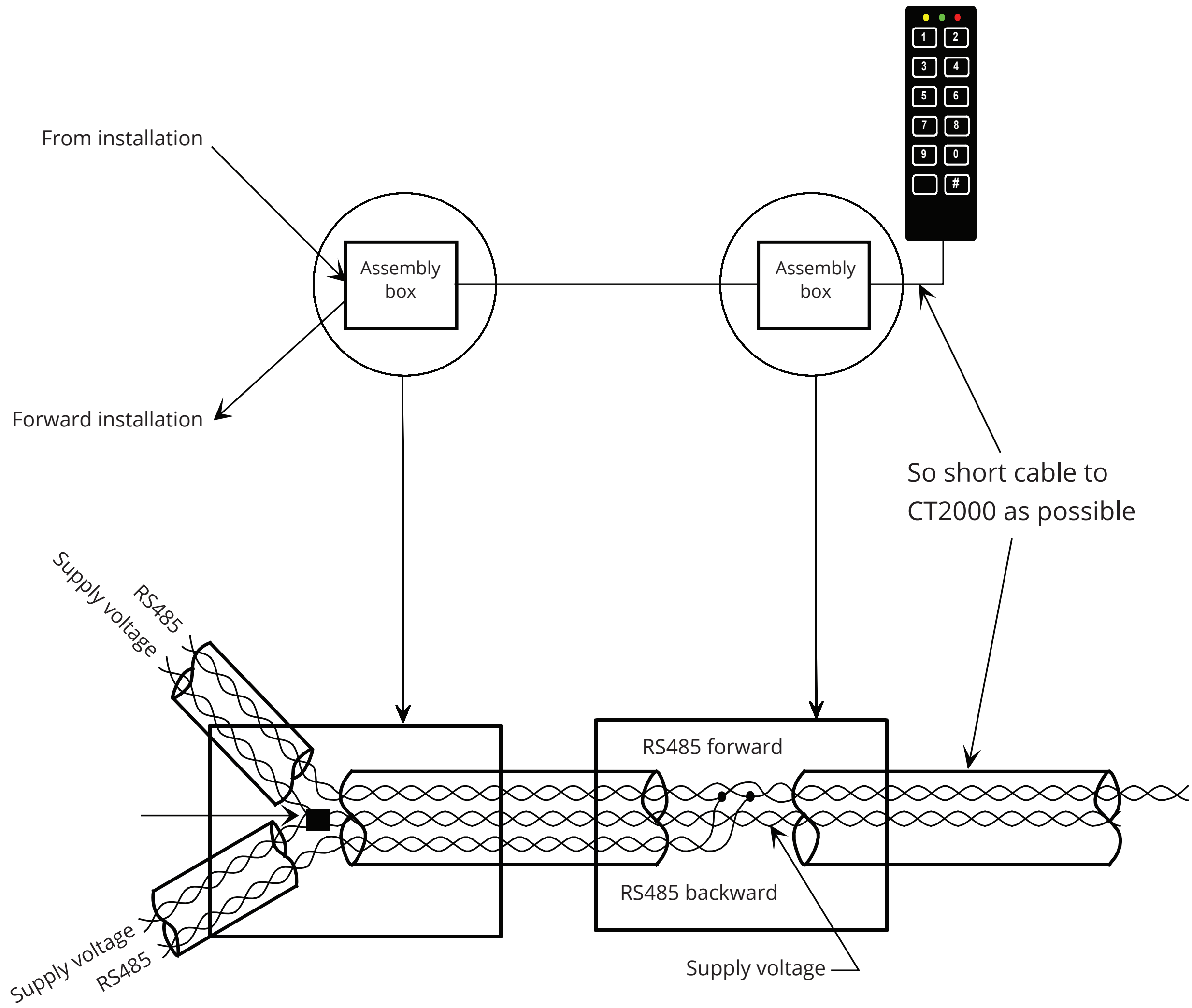


Star connections must under no circumstances be used. If this is the case with the 2000 system, the T connection are used, the T assembly must be **as short as possible.**

Failure to comply, it may help to reduce the maximum cable length and transistor speed by up to factor of 100, per. illegal collection of installation.



RS485 installation principle



Note how the RS485 bus in seperate pair of back and forth to the various units in the 2000 system. The power supply can freely be placed as it fits in the installation.

6. Technical specifications

Supply voltage:	12/24 VDC
Voltage interval:	9 - 27 VDC
Voltage ripple:	Max. 200 mV
Consumption:	40 - 120 mA
Output:	Open collector, 500 mA
Humidity:	Max. 99% RF
Dimensions (HxWxD):	130x50x8 mm
Cable:	4 m white, 8 core

BOM:

CT2000 with SKAFOR 3 (tamper switch)

- 1 Keypad with cable.
- 1 Frontlabel
- 1 diode
- 4 screws (Ø2,9x25mm).
- 1 screw (Ø4,0x30mm).
- 5 Plugs (Ø5x25mm).
- 1 spring for tamper switch.

CT2000 without SKAFOR 3

- 1 Keypad with cable.
- 1 Frontlabel
- 1 diode
- 4 screws (Ø2,9x25mm).
- 4 Plugs (Ø5x25mm).

Note:
CT2000 must be supplied with a 12 VDC regulated supply voltage (8 - 15 VDC), max 200 mV ripple.

7. Installation of PC Interface

7.1 PCI2000

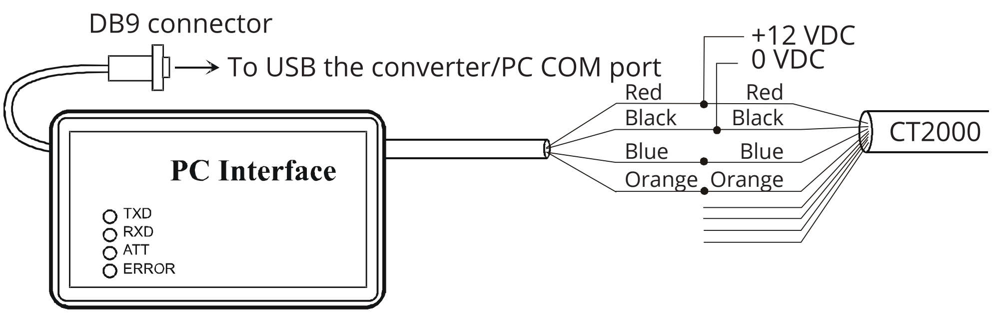
PCI2000 is a communication interface between a computer and one or more of the following products:

• CT2000 keypad and PR2000 proximity reader.
• Box 485-T and Box 485-4

PCI2000 can be used to program the 2000 system, and to scan the installation of connected devices.

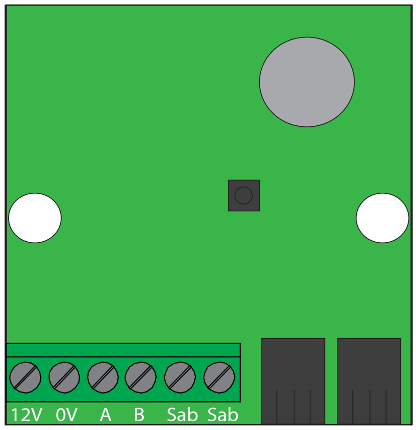
The PC interface DB9 connects to the PC via. a USB conveter. The other side of PCI2000 connected as follows:

• Red wire to **+12/24 VDC**
• Black wire to **0V DC**
• Blue wire to **A** on the 2000 systems RS485 bus
• Orange wire to **B** on the 2000 systems RS485 bus



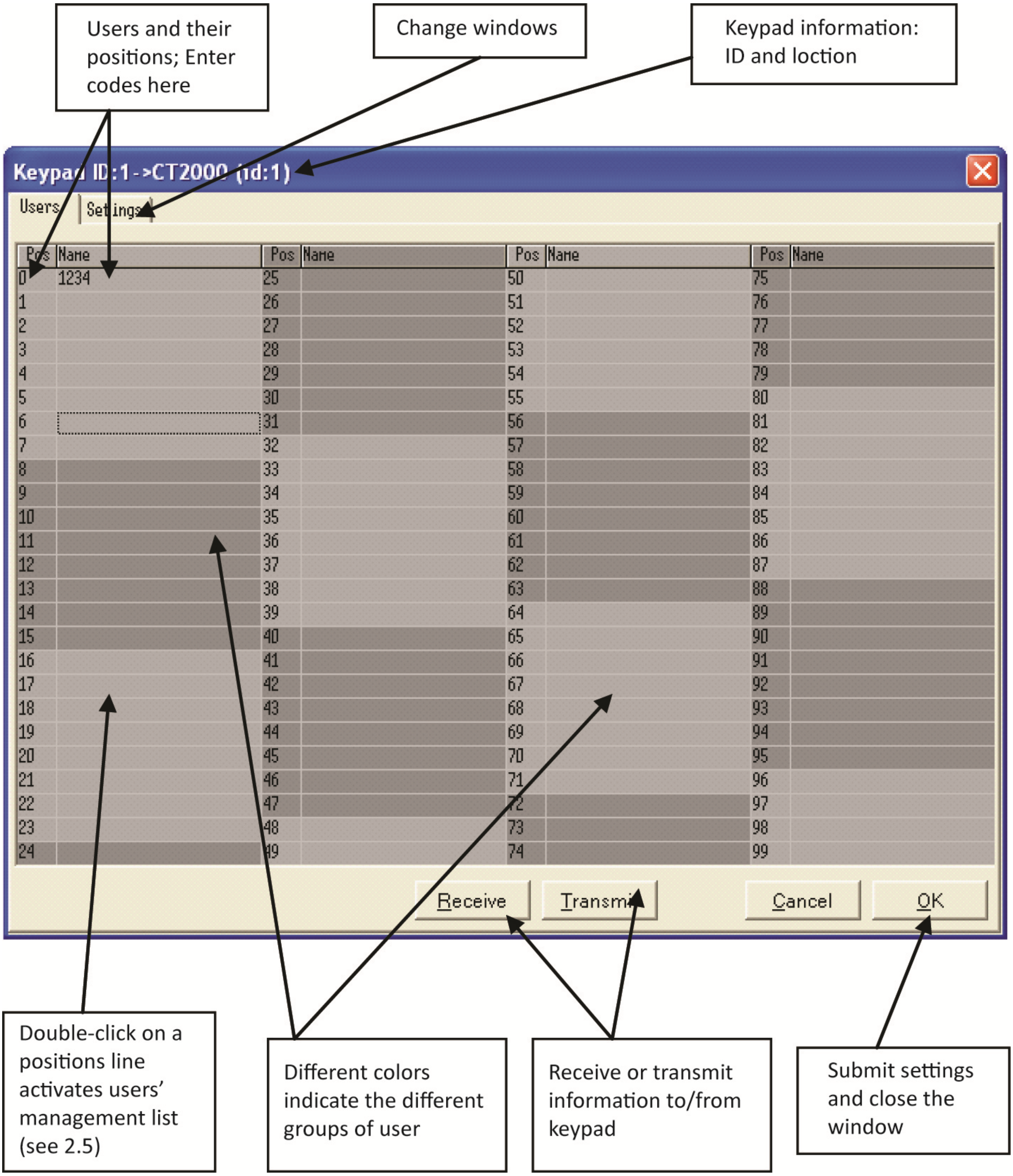
7.2 LogBox3

LogBox3 (Art. No.: 460017) is a PC interface with log function and report generator to store up to 10.000 logs.
Includes 2 cables for connection to PC and assembly box.

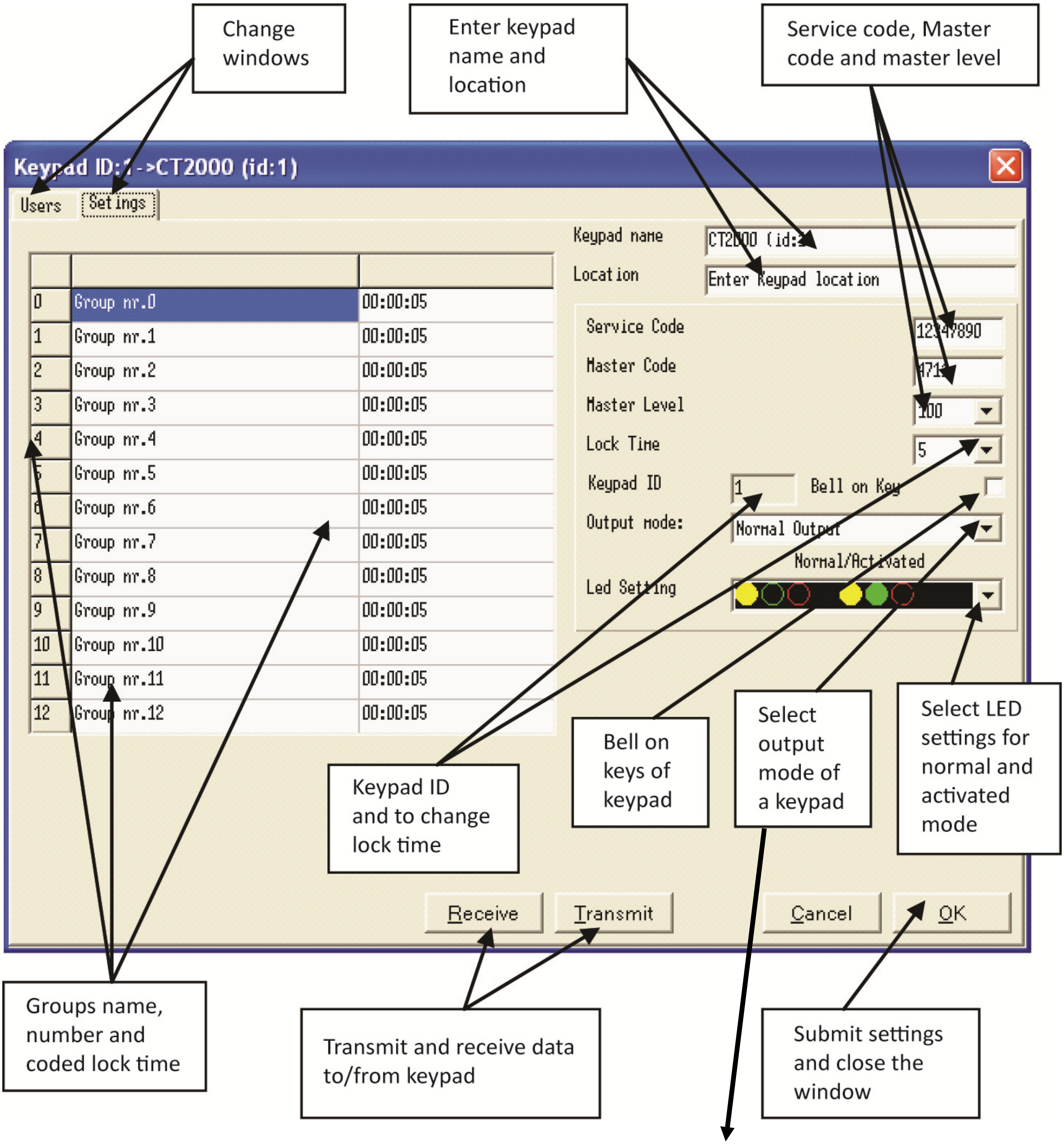


Conlan eXPress

User window



Setting window



Can be activated/deactivated by: #, #, #, 🔔

Output times for timer function/inverted timer function (hh:mm:ss)

Value	Time	Value	Time	Value	Time	Value	Time
0	0:00	64	3:15:00	128	19:15:00	192	35:15:00
1	0:01	65	3:30:00	129	19:30:00	193	35:30:00
2	0:02	66	3:45:00	130	19:45:00	194	35:45:00
3	0:03	67	4:00:00	131	20:00:00	195	36:00:00
4	0:04	68	4:15:00	132	20:15:00	196	36:15:00
5	0:05	69	4:30:00	133	20:30:00	197	36:30:00
6	0:06	70	4:45:00	134	20:45:00	198	36:45:00
7	0:07	71	5:00:00	135	21:00:00	199	37:00:00
8	0:08	72	5:15:00	136	21:15:00	200	37:15:00
9	0:09	73	5:30:00	137	21:30:00	201	37:30:00
10	0:10	74	5:45:00	138	21:45:00	202	37:45:00
11	0:15	75	6:00:00	139	22:00:00	203	38:00:00
12	0:20	76	6:15:00	140	22:15:00	204	38:15:00
13	0:25	77	6:30:00	141	22:30:00	205	38:30:00
14	0:30	78	6:45:00	142	22:45:00	206	38:45:00
15	0:35	79	7:00:00	143	23:00:00	207	39:00:00
16	0:40	80	7:15:00	144	23:15:00	208	39:15:00
17	0:45	81	7:30:00	145	23:30:00	209	39:30:00
18	0:50	82	7:45:00	146	23:45:00	210	39:45:00
19	0:55	83	8:00:00	147	24:00:00	211	40:00:00
20	1:00	84	8:15:00	148	24:15:00	212	40:15:00
21	1:15	85	8:30:00	149	24:30:00	213	40:30:00
22	1:30	86	8:45:00	150	24:45:00	214	40:45:00
23	1:45	87	9:00:00	151	25:00:00	215	41:00:00
24	2:00	88	9:15:00	152	25:15:00	216	41:15:00
25	2:15	89	9:30:00	153	25:30:00	217	41:30:00
26	2:30	90	9:45:00	154	25:45:00	218	41:45:00
27	2:45	91	10:00:00	155	26:00:00	219	42:00:00
28	3:00	92	10:15:00	156	26:15:00	220	42:15:00
29	3:15	93	10:30:00	157	26:30:00	221	42:30:00
30	3:30	94	10:45:00	158	26:45:00	222	42:45:00
31	3:45	95	11:00:00	159	27:00:00	223	43:00:00
32	4:00	96	11:15:00	160	27:15:00	224	43:15:00
33	4:15	97	11:30:00	161	27:30:00	225	43:30:00
34	4:30	98	11:45:00	162	27:45:00	226	43:45:00
35	4:45	99	12:00:00	163	28:00:00	227	44:00:00
36	5:00	100	12:15:00	164	28:15:00	228	44:15:00
37	6:00	101	12:30:00	165	28:30:00	229	44:30:00
38	7:00	102	12:45:00	166	28:45:00	230	44:45:00
39	8:00	103	13:00:00	167	29:00:00	231	45:00:00
40	9:00	104	13:15:00	168	29:15:00	232	45:15:00
41	10:00	105	13:30:00	169	29:30:00	233	45:30:00
42	11:00	106	13:45:00	170	29:45:00	234	45:45:00
43	12:00	107	14:00:00	171	30:00:00	235	46:00:00
44	13:00	108	14:15:00	172	30:15:00	236	46:15:00
45	14:00	109	14:30:00	173	30:30:00	237	46:30:00
46	15:00	110	14:45:00	174	30:45:00	238	46:45:00
47	20:00	111	15:00:00	175	31:00:00	239	47:00:00
48	25:00	112	15:15:00	176	31:15:00	240	47:15:00
49	30:00	113	15:30:00	177	31:30:00	241	47:30:00
50	35:00	114	15:45:00	178	31:45:00	242	47:45:00
51	40:00	115	16:00:00	179	32:00:00	243	48:00:00
52	45:00	116	16:15:00	180	32:15:00	244	48:15:00
53	50:00	117	16:30:00	181	32:30:00	245	48:30:00
54	55:00	118	16:45:00	182	32:45:00	246	48:45:00
55	1:00:00	119	17:00:00	183	33:00:00	247	49:00:00
56	1:15:00	120	17:15:00	184	33:15:00	248	49:15:00
57	1:30:00	121	17:30:00	185	33:30:00	249	49:30:00
58	1:45:00	122	17:45:00	186	33:45:00	250	49:45:00
59	2:00:00	123	18:00:00	187	34:00:00	251	50:00:00
60	2:15:00	124	18:15:00	188	34:15:00	252	50:15:00
61	2:30:00	125	18:30:00	189	34:30:00	253	50:30:00
62	2:45:00	126	18:45:00	190	34:45:00	254	50:45:00
63	3:00:00	127	19:00:00	191	35:00:00	255	On / off