

DRC-2 Telephone Receiver

Quick Guide

*FW ver: 0.7.12
(12-08-2004)*

<http://cdrs.try.hu>

Main Features:

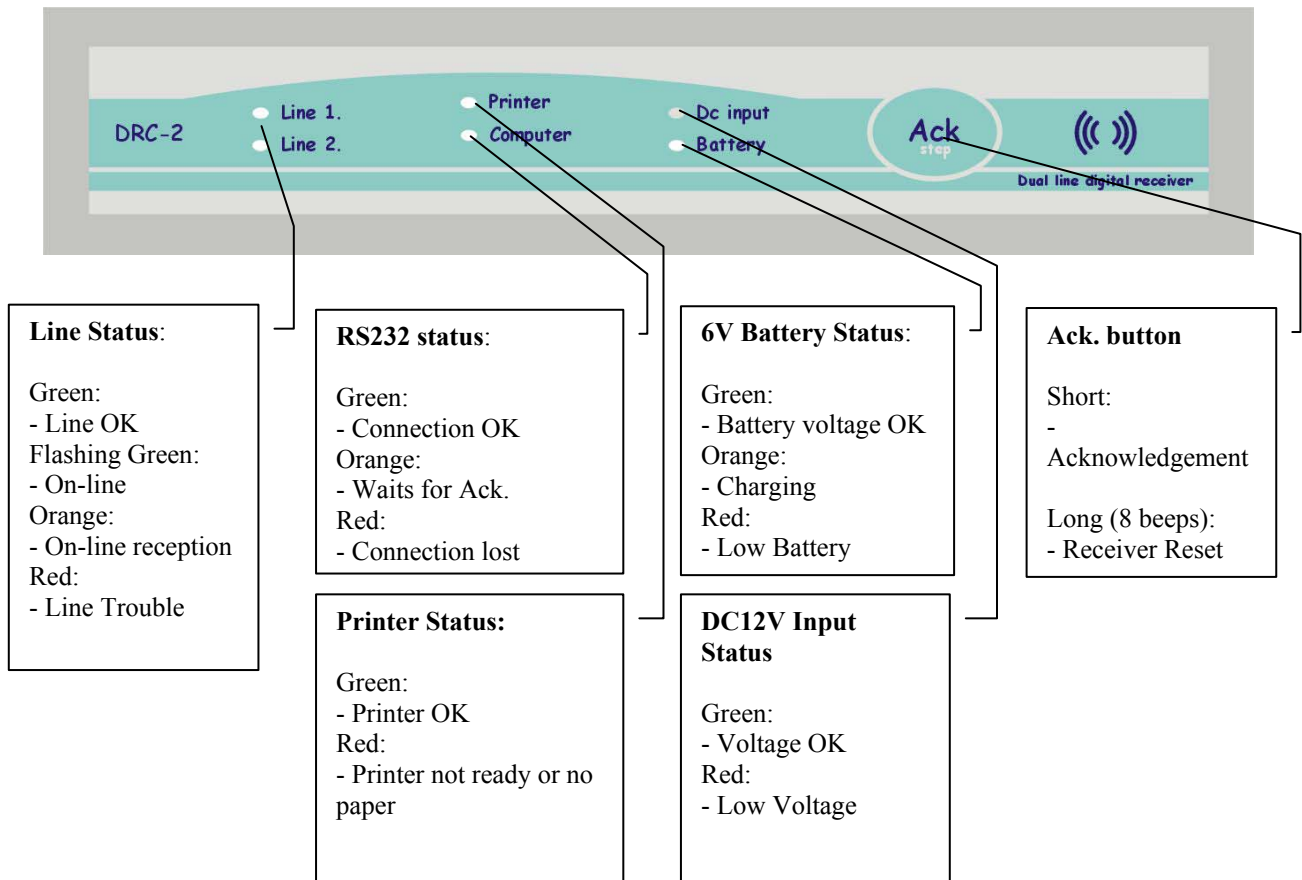
- 2 independent Linecards
- External (Wall-mounted) DC12V power unit or 12V UPS
- In-built 6V battery charger with programmable charging current (6V -1.3Ah, 4Ah, 7Ah)
- No interference signal transmission and the in-built 6V power supply provides effective linear stabilizers.
- Low power consumption, long life battery. (more than 30 hours with 6V-4Ah)
- In-built Clock. (Y2K compatibility).
- In-built Event Buffer (max: 4000 events)
- In-built parallel printer output (printer event buffer)
- Programmable printing modes
- Standard serial protocol (Basic + Clock signal)
- Serial line for parameter setting and FW Update
- Multilink (in versions 1.0.11 or higher)
- In-built sounder with tones and programable function modes
- In-built Acknowledge button.
- Clear, multicolor LEDs for particular functions
- Programmable (OC) output for essential troubles.
- Programmable input (external anti-tamper or external acknowledgement)
- Small design, easy installation

Recommended application:

This low-cost device is ideal for smaller systems but with linked receivers it can be used in municipal monitoring as well.

- Backup system Stations
- Building Monitoring Stations
- Technical Monitoring Stations
- Municipal Monitoring Stations

Front



Internal Sounder:

The internal sounder can be programmed different functions:

- Always Off
- Always On
- Enabled in „offline” only.

If the sounder is enabled a short sound can be programmed to notify line events (if the reception is incorrect two long signals will be heard).

The meaning of the sounds:

- Short, high sound: Button pressed or new line event
- Two deeper sounds: System failure (flashing red LED(s)) repeated until acknowledged or wrong line format.
- Deep sound in every minutes: Internal clock not set

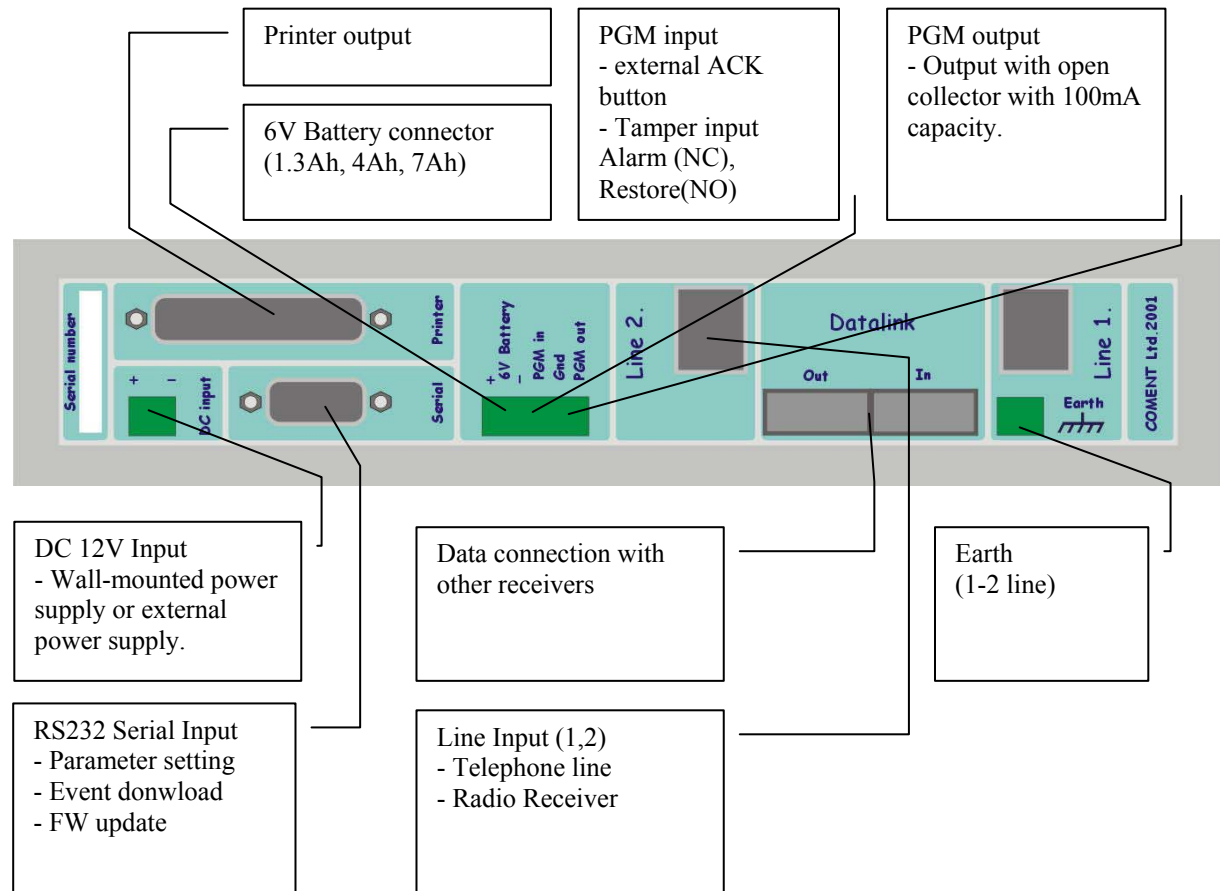
If the sounder is enabled new troubles will appear with flashing red light. After manual acknowledgement, red lights will turn to steady and the sounder will go off.

Acknowledge button:

It is a multi-function button:

- Short press means acknowledgement.
- After 2 second hold, short repeated (every 1sec) sounds indicate function menu scrolling. After the 8th sound release the button and the receiver resets

Backplate Connectors



DC input

Connector for external 12VDC. The required input voltage is 11 – 20V. The receiver reports trouble if the voltage drops below 11Volts. Supply adequate charging current for the battery.

Maximum current consumption (when charging) in accordance with the battery settings:

1.3Ah	70 - 250mA (Wall-mounted power supply e.g. ICA12-500PC)
4Ah	70 - 500mA
7Ah	70 - 900mA

The input is polarity-proof. If the polarity is reversed the power supply won't be recognised.

6V Battery

6V battery can be connected only!!!

Do not connect external load to the battery clamps since it affects the function of the automatic charger!

The battery input is polarity-proof and short protected (electrical). The receiver will shut down in case of abnormal state.

By default, the charger operates in longer charging time (charging current is 5-10% of the capacity) to spare the battery lifetime. The charging current can be decreased but it is not recommended to set it to a higher value.

PGM input

The programmable input recognises the closing of PGM In to GND terminal. In Anti-Tamper input function, the cut (NC) causes alarm and the short causes restoral.

PGM output

PGM output is an open collector output with 100mA loads capacity. It supplies steady negative (GND) until the programmed troubles are present. It can supply small sounder, strobelight or relay spool. It can't supply positive to the connected unit! Use the positive of the 12V input (Do not use the positive of the battery!).

Serial

RS232 input and output for PC connection. In the following format:

9600 baud, 7bit + Even parity, 1 stop bit

Printer

Parallel printer output (40 or 80 characters/line). Programmable printer functions. In power on mode the system continuously monitors the printer. The required minimum control signals for printer:

- STROBE Input
- DATA1-8 Inputs
- ACKNLG Output
- BUSY Output
- PE Output
- ERROR Output

Datalink

In- and Outputs for linking more receivers. (Not supported by the current version)

Line 1,2

Terminals of the Line Inputs are installed directly into the linecards therefore, it is always corresponds to the current card. Telephone line connectors can be connected as in usual. (the inner two wires are the lines)

Earth

Lightning protection earth. It is the outlet of the lightning protection earth of the linecards. (The points are the same inside therefore it is enough to use one of them). With this earth connection the efficiency of the overvoltages can be essentially increased.

Setup

1. Connect the end of the wire of the included wall-mounted power supply to the DC In input, do not apply power yet.
2. Connect the plug of the included (9/9) serial cable to the receiver and the socket to the PC. The PC connection is significant for the clock settings.
3. Connect the printer and switch it on. Optional.
4. Connect the included battery cable to the receiver (5-pole plug), do not connect the clamps to the battery yet. The 6V battery is optional but supply 12V Ups if not used.
5. Connect the telephone line to the linecard (Line 1 or Line 2)
6. Connect the power supply to the Mains.
7. All LED in the frontplate light in orange, after 2 seconds the system starts.
8. „Line 1,2” lights in Green to indicate installed lines. If there is no card the LEDs are Off.
9. The „Printer” LED of the printer lights in Green (if the printer is enabled). If the printer is disabled the LED is Off. The printer test takes 1 minute hence the green LED lights for a minute although there is no printer connected.
10. The „Computer” LED lights in orange (It is up to send reports to the PC but no acknowledgement arrives). After 10 seconds, the flashing red LED and the repeated sound warns that the connection to PC is lost. If the monitoring program is running the LED lights in green after initialising the connection.
11. The „DC Input” LED lights in green indicating the adequate voltage of the 12V input.
12. The „Battery” LED of the 6V battery lights in green. Connect the clamps to the 6V battery (verify correct polarity: Red – Positive, Black - Negative). If the battery takes charging current the LED goes green. The default type of the battery is 1.3Ah (That is the maximum current the included power supply is able to supply with the nominal voltage)
13. Stop occasional sound signals by the short press of the „ACK” button.
14. Run „DRConfig” program on the PC then set the adequate parameters and time (Time can be set from ÖrMe program).
15. Exit the program and start monitoring software (Set the serial format to 9600, 7 + Even Parity if not the ÖrMe software is used).

Now, the receiver is ready to receive line events.

The receiver reset will clear the event buffer and resets the clock but the parameters will be stored. Linecard parameters will be uploaded to linecard only after reset, consequently reset the receiver after each modification. Other parameters will be validated immediately. In subsequent software versions won't require this reset.

Printer Format

A monitoring software (e.g. ÖrME) is suitable to operate the receiver but the events can be displayed on a printer as well. The events can be divided into two essential groups: Events, status changes (account code 0000, line number 0) generated by the receiver and the events arrived via line.

System Events:

11:16:58-07/02 0000-D0 Reset

1. **11:16:58-07/02** Hours : Mins : Seconds – Day / Month
2. **0000-D0** Account (receiver) – Event Code
3. **Reset** Short name of system event
4. **01-0** Receiver number (always 01) – line number (in System always 0)

Basic protokoll (4/1 – 4/3):

19:22:44-07/02 1234-58 P(4/2) 01-1

1. **19:22:44-07/02** Hours : Mins : Seconds – Day / Month
2. **1234-58** Account – Event Code

- 3. P (4/2) Line format Pulse 4/2 (P – Pulse, DT – DTMF)
- 4. 01-1 Receiver number (always 01) – Line number (1 or 2)

ContactID protokoll:

14:36:14-07/02 1234-E130 z002g01 01-1

- 1. 14:36:14-07/02 Hours : Mins : Seconds – Day / Month
- 2. 1234-E130 Account – Event Code
- 3. z002g01 z – zone number, g – group number
- 4. 01-1 Receiver number (always 01) – Line number (1 or 2)

Debug protokoll:

11:57:14-07/02 ?(2341816A2A1AAA) 01-1

- 1. 11:57:14-07/02 Hours : Mins : Seconds – Day / Month
- 2. ?(2341816A2A1AAA) ?(non-interpretable digits)
- 3. 01-1 Receiver number (always 01) – Line number (1 or 2)

DRC-2 System Events:

System events arrive with account code 0000.

Code	Printed	Event	Description
D0	Reset	RECEIVER RESET	After power on (Receiver reset)
05	CommErr	COMM ERROR	PC connection lost
06	Comm Ok	COMM OK	PC connection restored
01	Prn Err	PRINTER ERROR	Printer is Off or out of paper
02	Prn Ok	PRINTER OK	Printer ready
15	DCinErr	DC IN ERROR	No 12V power
16	DCin Ok	DC IN OK	12V power restored
03	BattErr	BATTERY LOW	6V battery voltage low
04	Batt Ok	BATTERY OK	6V battery charged
0C	ChangeP	PROGRAM ACCESS	Parameters modified (DRC2Config)
1B	SetTime	TIME / DATE SET	Clock set
07	TampArm	TAMPER ALARM	DRC2 tamper input in alarm
08	TampRes	TAMPER RESTORE	DRC2 tamper restored
09	Man Ack	MANUAL ACK	Acknowledgement on DRC2 (only if trouble occurs after alarm)

Line System Events: (Line1, Line2)

Code	Printed	Event	Description
20	LineErr	LINE ERROR	Line Error
30	Line Ok	LINE OK	Line OK
F0	CardTrb	LINE CARD FAIL	Linecard connection failed
10	CallTrb	FAULT DATA	Fault data on line (non-interpretable format) DEBUG protocol lists the data

Program Versions:

The Firmware of DRC-2 receiver can be updated subsequently by the user by FW update function. This function helps the user to insert new features to the system.

FW v0.5.12 (2002-05-27)

Warning! Version v0.5.12 resets all parameters to default at the first update (e.g. v04.12 -> v0.5.12) because of the extended parameters!!! Therefore, after downloading, re-define the parameters (if the system uses other settings than default).

New Features:

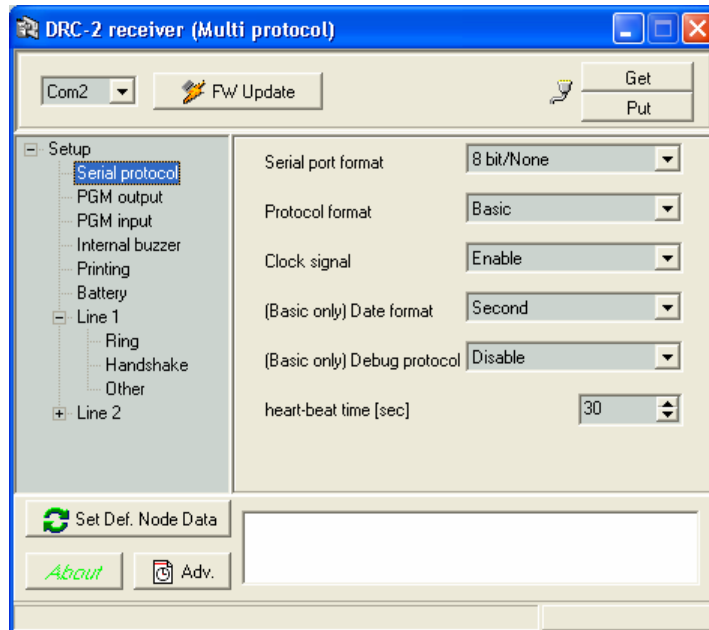
- Serial port format can be set.
Format: 8 databits, no (None) parity, 7 databits + Even parity, 7 databits + Odd parity
DRC2 Config program operation is not affected by the port settings!
- Inaccurate clock warning signal can be disabled.

Repairs:

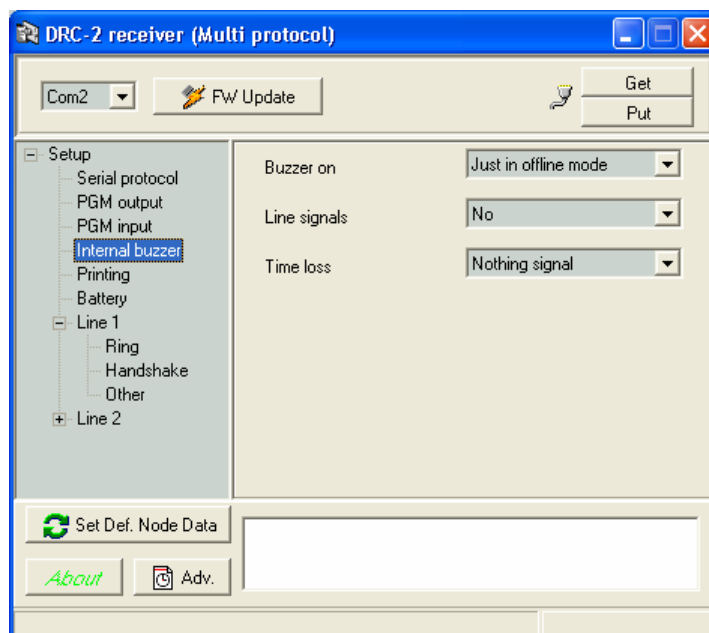
- Repaired date management.

Compatibility with other receivers:

DRC-2 receiver is able to cooperate with Enigma CPM module by this means it can be used as secondary receiver or even backup. Enigma feed bar can supply DRC-2 receiver (Enigma 12V → DRC-2 DC input) Since the Enigma 12V feed bar is UPS the 6V battery of DRC-2 is also needless. The serial output of DRC-2 is connected to the COM2 input of the CPM module causing CPM screen display the events. For cables required to connect the devices please, contact manufacturer. Before starting the operating perform the following settings in DRC-2 receiver.



Since the dating of events received on the serial input of Enigma managed by CPM module (excluding Clock signal) the clock of DRC-2 is disregarded. If no printer is connected to DRC-2 the clock setting is useless. To prevent missing setting signal the sound can be disabled.



Automation Software Interface Definition

Normally, when an event is received, the receiver sends it in a message to the automation software with the protocol assigned to the event format. After sending one message to the computer, the receiver waits for the acknowledge from the automation software. The acknowledge message is a **CTRL-F (06h)** character. The **acknowledge must be received within a 3 seconds timeout period.**

If no acknowledge is received, the DRC-2 will try to resend the event 3 more times. If all attempts fail, the receiver generates a “Communication Error” event, and will keep it in the memory buffer and **repeatedly try to send the event until it succeeds.** The CPM Unit can store up to 4095 events in its memory buffer if the connection to the central station computer is broken.

If the receiver succeeds to send the event after a communication failure a “Communication Restored” event will be recorded. After the communication channel is restored, the DRC-2 will send all pending reportable events from its memory buffer to the computer. This method provides reliable and supervised communication between the DRC-2 and the central station computer.

The COM1 port is also supervised with heart-beat signals (See Serial Protocols/Heartbeat protocol). The heart-beat signals are used to test the communication channels between the receiver and the central station computer when there is no reportable event in the memory buffer. It works that way, that the receiver sends so called heart-beat signals to the computer in a programmed time and requires acknowledge for that. If the acknowledge is missing for 3 consecutive times, it assumes that the computer is failed, and gives “Communication Error” message.

If the automation software is not compatible with heart-beat supervision, the heart-beat signals can also be turned off by programming the heartbeat period to 0 in the receiver.

Serial Port Options

Port setting is 9600 baud, 7 databits, even parity.

Note: in all protocols ‘s’ means space (20h). The digits not in use are also reported as spaces.

Basic Signal Protocol

The Basic Signal Protocol is the mostly used protocol by the receiver. Receiver status events and the 3/1, 3/2, 4/1, 4/2, 4/3 (etc.) events received by the Line Cards and also the events received by the radio module are forwarded to the CPM using this protocol. The protocol format is:

```
1RRLssssAAAAAAssGYYY [DC4]
```

Where:

1	Protocol ID
RR	Receiver number
L	Line Card ID – can be ‘1’ to ‘2’ for line cards 1 – 2
AAAAAA	Account number
G	Area/Group number – in case of radio received event, the power of the received signal
YYY	Event code
[DC4]	Terminator, 014h

Heart-beat Protocol (Supervisory Protocol)

This protocol is used to supervise the connection between the digital receiver and the computer. It is sent periodically in a programmable time interval and the computer should positively acknowledge it for verification. (default period is 30 seconds)

1RR0sssssssssss@ssss [DC4]

Where:

1 Protocol ID (Basic Signal)
RR Receiver number
@ Heart-beat signal
[DC4] Terminator, 014h

Contact ID Protocol

The Contact ID Protocol is used to send messages received in Contact ID format to the computer

5RRLs18AAAAQXXXYYZZZ [DC4]

Where:

5 Protocol ID
RR Receiver number
L Line Card ID – can be ‘1’ to ‘2’ for line cards 1 – 2
AAAA Account number
Q Event Qualifier E – new event or open, R – restore or close, P – previous event
XXX Class and event code
YY Group/Area number
ZZZ Zone/User number
[DC4] Terminator, 014h

Debug Protocol

This protocol is used to transmit the Fault Data the Line Cards received.

9RRLddddddddddddds [DC4]

Where:

9 Protocol ID
RR Receiver number
L Line Card ID – can be ‘1’ to ‘2’ for line cards 1 – 2
ddd. . dd Fault Data received
[DC4] Terminator, 014h

Clock Signal Protocol

The Clock Signal Protocol is used to transmit time and date information together with the events. The Clock Signal is inserted to the serial protocol before the terminator character. The sending of Clock Signal Protocol can be enabled or disabled (See DRC-2 Options). The Clock Signal format is the following:

```
[Protocol]HH:MM:SS-dd/mm[DC4]
```

or, when reporting of the year of the event is selected:

```
[Protocol]HH:MM-dd/mm/yy[DC4]
```

Where:

[Protocol]	Protocol normally sent by the receiver (as described above)
HH	Hour
MM	Minute
SS	Second
Dd	Day
Mm	Month
Yy	Year (optional, see Y2K issue)
[DC4]	Terminator, 014h

Note, that for the Heart-beat Protocol the Clock Signal is not inserted, even if it is enabled with other protocols.