# EN 1001

## Preliminary Data Sheet

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## EM-NOVA Microapplications
## 2007-2008

EN1OO1 ICOM® PCR-1000 Digital Radio Control and Interface

## EN1001 - a quick and easy solution for your PCR-1000

No doubt: the ICOM® PCR-1000 is a pretty nice radio. With the right software you can experience many interesting hours in front of your PC. With the right (offset) antenna, shielding from your local area network, wireless equipment and computers, you will have much success in receiving far distant stations and decoding new digital technologies.

But what about quick and easy listening? Getting up in the morning and switching on this radio requires booting your PC, starting the control program, selecting the right station... This can take many minutes before your favorite music sounds from the speaker...

What you will want is an easy way to override the PC dependence, when you don't need all the sophisticated functions of the software control.

There is another drawback with the PC controlled radio concept. The electromagnetic pollution inside the walls of our houses become a real thread for sensitive radio reception. Not only the computer the radio is linked to will disturb your efforts, but wireless, cable and tv networks become the enemy of the radio.

Three measures can help:
• Place the antenna and best the PCR-1000, too, as far away from the source of pollution as you can
• Disconnect the PC and your home power network galvanically from the radio power supply, e.g. use wireless serial data transfer
• Substitute your PC by a low emitting source of pollution

The EN1001 integrated circuit can help you implementing all of these measures:
• The small device, even together with the few peripherals it requires, is an extremely weak source of pollution only
• It supports remote control of the PCR-1000 over cable or wireless serial connections by different serial speed modes - and

... just switch it on - and select your favorite radio station within seconds instead of minutes...
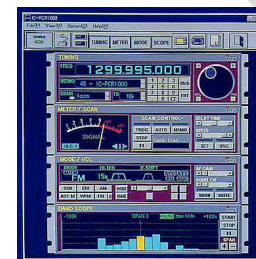
The EN1001 is not designed as a super device, that enables you to use all PCR-1000 functions instead of the PC. Your PC still has its right! Therefore the EN1001 does not provide access to the following PCR-1000 functions: IF shift - BFO shift - DSP add-on - DTMF/CTCSS/Tone squelch - Voice scan - Bandscope - AFC - Other baudrates than 9.600/38.400 Bd

But you have access to the following functions: Radio on/off - AF Volume - Squelch - Frequency tune - ATT - NB - AGC - Filter bandwidth - Demodulator mode - Tune step - Channel Scan - LED S-Meter - 150 frequency/filter/mode/step memory

Important notice:
The EM-NOVA EN1001 is an independent device for operation with the ICOM® PCR-1000. It has not been tested or endorsed by ICOM. While EM-NOVA has designed and tested the EN1001 carefully its operation in conjunction with the PCR-1000 is at the sole risk of the user.

### EN1001   ICOM® PCR-1000 Digital Radio Control and Interface

#### Features

- Stand-alone radio control for ICOM® PCR-1000
- Access to almost all PCR-1000 functions through rotary encoders, push buttons and LCD display
- Low power 5V/20mA operation (200 mA, if LCD display backlit)
- Single chip solution, only user interface elements and RS232 level conversion are additionally required
- Four rotary encoder inputs for different tune functions (with integrated pull-up resistors) with digital micro code bouncing elimination
- Ten push button and one on/off switch inputs for radio control functions (with integrated pull-up resistors)
- Standard 20x4 LCD alphanumeric HD44780 compatible interface
- 7 banks with 10 channels EEPROM frequency and mode memory (100,000 write cycles)
- 8 banks with 10 channels each Flash-ROM memory, with 12-character text field (10,000 write cycles)
- 8.33 kHz Air Band channel functions
- Bank scan feature
- 9,600/38,400 ICOM compatible baud rate

#### Applications

- Directly interfaces ICOM® PCR-1000 without need for PC-based control – ready-to-use whenever you like to listen to your radio
- Much less rf interferences compared to PC operation
- Stand-alone solution for field or remote operation of PCR-1000, even battery powered
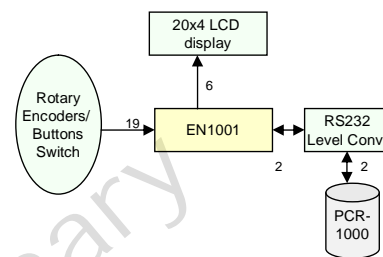


#### Pinout
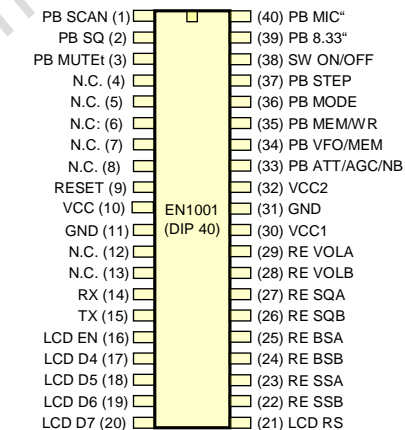


SW:Switch PB:Push button RE:Rotary encoder

#### Quick Reference

| Absolute Maximum Ratings | EN1001-8-003 |
|---|---|
| VCC supply voltage referenced to GND | 6.0V |
| Input voltage at any other pin than VCC referenced to GND | -0.5V...VCC+0.5V |
| DC current at any pin exc 10-13,30-32 | 40 mA |
| DC current VCC/GND | 200 mA |
| Storage temperature | -65°C...+150°C |
| Operating temperature (crystal clk) | -55°C...+125°C |
| Operating temperature (standard) | +15°C...+35°C |

| Recommended Operating Ratings | EN1001-8-003 |
|---|---|
| VCC supply voltage referenced to GND | 5.0V |
| Operating temperature | -40°C...+85°C |
| Outputs | TTL |
| Analog inputs | VCC to GND |
| Encoder/Button/Switch Inputs | Open or GND |

EN1001   ICOM® PCR-1000 Digital Radio Control and Interface

### Principles of Operation

The EN1001 can substitute your PC for controlling the main functions of the PCR-1000. For this purpose it sends ASCII control strings over the serial interface to the PCR-1000. These strings are exactly the same as output by your PC when using the original or another PCR-1000 control software. The EN1001 also listens to reply strings from the PCR-1000, but only a few are used for non-basic functions (squelch open, S-Meter, scan) and therefore the reception capability is not mandatory.

The serial interface of your PC is usually connected to your PCR-1000 by a multi-wire cable. The connection between the EN1001 and your PCR-1000 uses three wires only: Receive (RX), Transmit (TX) and Ground (GND).

To adapt the voltages on the RS232 lines the EN1001 requires a level converter, e.g. MAX232 to convert RS232 levels to TTL voltages. RS232 lines may NEVER be connected directly to the EN1001, but will destroy it in this case.
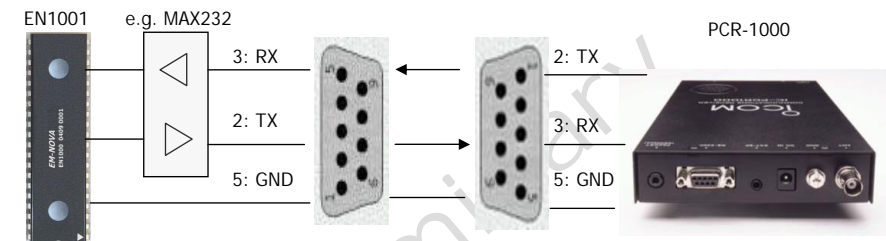


Plug and cable arrangement between  EN1001 and PCR-1000

It is a good idea to make the PC, the EN1001 and the PCR-1000 connectable to any of each other. Why? While you will like to use the EN1001 to control your radio everyday, you will sometimes also like to use the enhanced capabilities of your PC software, when strange signals are around. On the other hand the memory of the EN1001 can be programmed from your PC. So you need the capability to connect every device to any of the two others, while the unused device is fully disconnected. This three-way switch must also disconnect the unused GND line to prevent digital signal pollution.
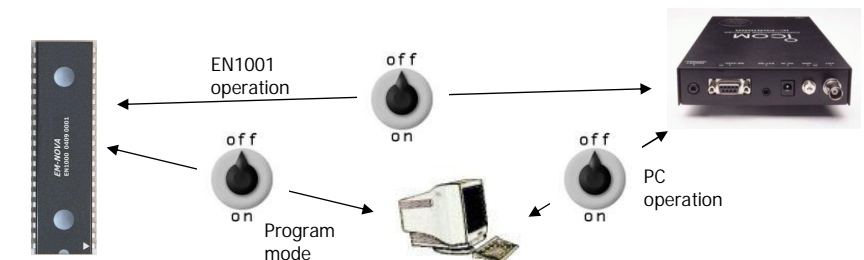


Plug, cable and three-way-switch arrangement between PC, EN1000 and PCR-1000

EN1001 ICOM® PCR-1000 Digital Radio Control and Interface

### EN1001 Pinout table - Pins 1 - 20

| Pin | Function | In/Out | Pullup* | Charac.* | Description |
|---|---|---|---|---|---|
| 1 | PB SCAN | IN | PULLUP | TTL-in | In MEM mode only: starts/stops scan of stored channels. Halts if signal is present. Restarts scan after ca. 3 sec. Secondary: Stores memory channel if MEMWR was pressed |
| 2 | PB SQ | IN | PULLUP | TTL-in | Opens/closes squelch. Last squelch setting is stored/restored. |
| 3 | PB MUTE | IN | PULLUP | TTL-in | Mutes/opens Audio. Last volume setting is stored/restored. |
| 4 | n.c. | IN | | TTL-in | not used - can be used in customized versions for additional functions (IN or OUT) |
| 5 | n.c. | IN | | TTL-in | not used - can be used in customized versions for additional functions (IN or OUT) |
| 6 | n.c. | IN | | TTL-in | not used - can be used in customized versions for additional functions (IN or OUT) |
| 7 | n.c. | IN | | TTL-in | not used - can be used in customized versions for additional functions (IN or OUT) |
| 8 | n.c. | IN | | TTL-in | not used - can be used in customized versions for additional functions (IN or OUT) |
| 9 | VCC/ RESET | IN | | | Hardware reset; can be connected to a push button to GND for manual reset - if not required connect to VCC - see application note 1 |
| 10 | VCC | IN | | | see application note 2 |
| 11 | GND | IN | | | Digital ground; do not connect to radio linear ground |
| 12 | n.c. | | | XTAL | Do not connect in standard clock mode - see application note 3 |
| 13 | n.c | | | XTAL | Do not connect in standard clock mode - see application note 3 |
| 14 | RX | IN | | TTL-in | Serial receive data; connect to D-SUB 9 male pin 2 through level converter, e.g. MAX232 - see application note 4 |
| 15 | TX | OUT | | TTL-out | Serial transmit data; connect to D-SUB 9 male pin 3 through level converter, e.g. MAX232 - see application note 4 |
| 16 | LCDEN | OUT | | TTL-out | LCD HD44780 enable; connect to LCD module pin 6 |
| 17 | LCDD4 | OUT | | TTL-out | LCD HD44780 data 4; connect to LCD module pin 11 |
| 18 | LCDD5 | OUT | | TTL-out | LCD HD44780 data 5; connect to LCD module pin 12 |
| 19 | LCDD6 | OUT | | TTL-out | LCD HD44780 data 6; connect to LCD module pin 13 |
| 20 | LCDD7 | OUT | | TTL-out | LCD HD44780 data 7; connect to LCD module pin 14 |

*Please refer to section "DC characteristics" for details.

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### EN1001 Pinout table - Pins 21 - 40

| Pin | Function | In/Out | Pullup* | Charac.* | Description |
|---|---|---|---|---|---|
| 21 | LCDRS | OUT | | TTL-out | LCD HD44780 RS; connect to LCD module pin 4 |
| 22 | RE SSB | IN | PULLUP | TTL-in | Rotary encoder Small tuning step B |
| 23 | RE SSA | IN | PULLUP | TTL-in | Rotary encoder Small tuning step A |
| 24 | RE BSB | IN | PULLUP | TTL-in | Rotary encoder Big tuning step B |
| 25 | RE BSA | IN | PULLUP | TTL-in | Rotary encoder Big tuning step A |
| 26 | RE SQB | IN | PULLUP | TTL-in | Rotary encoder Squelch B |
| 27 | RE SQA | IN | PULLUP | TTL-in | Rotary encoder Squelch A |
| 28 | RE VOLB | IN | PULLUP | TTL-in | Rotary encoder Audio Volume B |
| 29 | RE VOLA | IN | PULLUP | TTL-in | Rotary encoder Audio Volume A |
| 30 | VCC1 | IN | | | see application note 5 |
| 31 | GND | IN | | | Digital ground; do not connect to radio linear ground |
| 32 | VCC2 | IN | | | see application note 6 |
| 33 | PB ATT/AGC/NB | IN | PULLUP | TTL-in | toggles through ATT, AGC, NB settings |
| 34 | PB VFO/MEM | IN | PULLUP | TTL-in | changes between VFO and MEM mode |
| 35 | PB MEMWR | IN | PULLUP | TTL-in | Enters MEMWR mode to store/erase a channel in the selected bank. SCAN follows to store, MUTE folows to erase. |
| 36 | PB MODE | IN | PULLUP | TTL-in | toggles through Demodulator/Bandwidth modes |
| 37 | PB STEP | IN | PULLUP | TTL-in | toggles through tuning small steps |
| 38 | SW ON/OFF | IN | PULLUP | TTL-in | Switch on/off; switch to be closed when radio on |
| 39 | PB 8.33 | IN | PULLUP | TTL-in | between 118 and 137 MHz only: toggles between 8.33 and 25 kHz mode |
| 40 | PB MIC | IN | PULLUP | TTL-in | in VFO mode: toggles between standard and micro tuning steps - in MEM mode: transfers current settings to VFO mode |

*Please refer to section "DC characteristics" for details.

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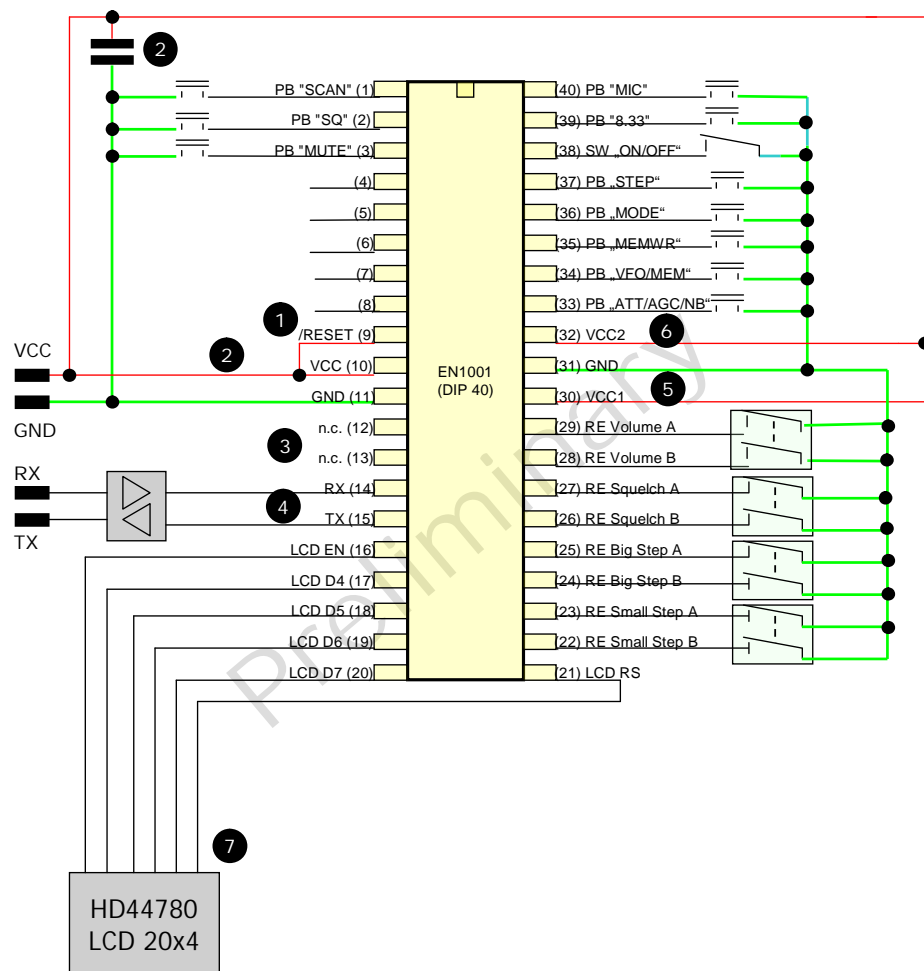## EN1001     General Application Layout



```
                    PB "SCAN" (1)          40) PB "MIC"
                    PB "SQ" (2)            39) PB "8.33"
                    PB "MUTE" (3)          38) SW „ON/OFF"
                    (4)                    37) PB „STEP"
                    (5)                    36) PB „MODE"
                    (6)                    35) PB „MEMWR"
                    (7)                    34) PB „VFO/MEM"
                    (8)                    33) PB „ATT/AGC/NB"
                    /RESET (9)             32) VCC2
                    VCC (10)    EN1001     31) GND
                    GND (11)    (DIP 40)   30) VCC1
                    n.c. (12)              29) RE Volume A
                    n.c. (13)              28) RE Volume B
                    RX (14)                27) RE Squelch A
                    TX (15)                26) RE Squelch B
                    LCD EN (16)            25) RE Big Step A
                    LCD D4 (17)            24) RE Big Step B
                    LCD D5 (18)            23) RE Small Step A
                    LCD D6 (19)            22) RE Small Step B
                    LCD D7 (20)            21) LCD RS
```

HD44780 LCD 20x4

① Please refer to hardware application notes

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## Hardware application notes

| | |
|---|---|
| ① | A manual reset push button may be connected to GND instead. It is recommended to decouple it by an RC combination. |
| ② | Proper decoupling between VCC and GND is required close to the EN1001 pins. Use 100nF capacitors |
| ③ | Not used unless an external crystal oscillator need to be connected. This may be the case if the baud rate is not precise enough over the operating temperature range. If you require a modified EN1001 for external crystal operation please contact EM-NOVA. |
| ④ | RX and TX lines must be buffered to RS232 levels. A MAX232, MAX3232 or similar device will do. Please refer to OEM documentation. |
| ⑤ | Connect to VCC |
| ⑥ | Connect to VCC |
| ⑦ | Standard LCD display connector pinouts: (1) GND (2) VCC (3) VDisplay (4) RS (5) RW (6) EN (7)(8)(9)(10) not used (11) D4 (12) D5 (13) D6 (14) D7. RW signal must be connected to GND. VDisplay must be connected according to panel OEMs instructions. |

Recommendation:

After assembly of a EN1001 hardware application it is strongly recommended to test the RS232 link together with a PC before connecting to a PCR-1000.
Use a terminal program as Hyperterminal and watch for characters incoming.
Be sure the RX and TX lines are properly connected, i.e. RX<->TX crossovers.
The PCR-1000 does not need other RS232 lines connected if used with EN1001.
The initial sequence is sent with 9600 Bd/8/n/1.
All data thereafter are sent with 38.400 Bd/8/n/1.
Set the terminal program to 38.400 Bd/8/n/1 and be sure you can read ASCII characters after the initial sequence.

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### EN1001 DC characteristics

| Symbol | Parameter | Condition | min | typ | max | units |
|--------|-----------|-----------|-----|-----|-----|-------|
| Supply | | | | | | |
| VCC | Supply voltage | | 4.75 | 5.0 | 5.25 | V |
| ICC | Power supply current | VCC=5V TA=25°C | | 12 | 15 | mA |
| | | VCC=5V TA=85°C | | 11 | | mA |
| TTL-in | | | | | | |
| VIL | Input low voltage | | -0.5 | | 0.2 VCC | V |
| VIH | Input high voltage | | 0.6 VCC | | VCC + 0.5 | V |
| IIL | Input leakage current low | VCC=5.25V | | | 1 | µA |
| IIH | Input leakage current high | VCC=5.25V | | | 1 | µA |
| PULLUP | | | | | | |
| RPU | Pull-up resistor to VCC | | 20 | | 50 | kOHM |
| TTL-out | | | | | | |
| VOL | Output low voltage | IOL=20mA | | | 0.7 | V |
| VOH | Output high voltage | IOH=-20mA | 4.2 | | | V |

Please refer also to front page for Absolute and Recommended Ratings.

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## Bank/Memory allocation procedure

The EN1001 contains

   • 7 banks (A to G) of reprogrammable memory, each 10  stations. These banks are stored in the non-volatile EEPROM inside the EN1001.

   • 8 banks (H to O) of non-programmable memory, each 10 stations. These banks are programmed ex-factory into the Flash-ROM of the EN1001. Most stations have been selected to represent a starting point for tuning a certain band.

Any of the frequencies, bandwidth filter, mode, tuning mode settings can be stored to banks A to G.

### Store a station:

   • Select station and other settings in VFO mode
   • Press MEMWR button
   • Observe display change to Bank/Memory indication followed by "!"
   • Select desired Bank/Memory
   • Free Memory is displayed as "?"
   • Non-programmable Memory is displayed as " ' "
   • Press SCAN

### Erase a station:

   • Tune Bank/Memory
   • Press MEMWR
   • Press MUTE
   • Observe "?X" to denote a deleted station

EN1OO1  ICOM® PCR-1000 Digital Radio Control and Interface

## Memory channel assignment (I)

| Bank A | Free programmable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

| Bank B | Free programmable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

| Bank C | Free rogrammable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

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## Memory channel assignment (II)

| Bank D | Free programmable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

| Bank E | Free programmable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

| Bank F | Free rogrammable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

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## Memory channel assignment (III)

| Bank G | Free programmable | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |

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## Memory channel assignment (IV)

| Bank H | Commercial Broadcasting | | | | |
|---|---|---|---|---|---|
| 0 | 100.000.000 | WFM | 250 | 50.0 | Default frequency |
| 1 | 144.000 | AM | 6 | 9.0 | LW broadcasting |
| 2 | 530.000 | AM | 6 | 10.0 | MW broadc. America |
| 3 | 531.000 | AM | 6 | 9.0 | MW broadc. Europe |
| 4 | 2.300.000 | AM | 6 | 5.0 | SW broadc. 120m |
| 5 | 3.200.000 | AM | 6 | 5.0 | SW broadc. 90m |
| 6 | 3.900.000 | AM | 6 | 5.0 | SW broadc. 75m |
| 7 | 4.750.000 | AM | 6 | 5.0 | SW broadc. 60m |
| 8 | 5.900.000 | AM | 6 | 5.0 | SW broadc. 49m |
| 9 | 7.100.000 | AM | 6 | 5.0 | SW broadc. 41m |
| Bank I | Commercial Broadcasting | | | | |
| 0 | 9.400.000 | AM | 6 | 50.0 | SW broadc. 31m |
| 1 | 11.600.000 | AM | 6 | 50.0 | SW broadc. 25m |
| 2 | 13.570000 | AM | 6 | 50.0 | SW broadc. 22m |
| 3 | 15.100.000 | AM | 6 | 50.0 | SW broadc. 19m |
| 4 | 17.480.000 | AM | 6 | 50.0 | SW broadc. 17m |
| 5 | 18.900.000 | AM | 6 | 50.0 | SW broadc. 16m |
| 6 | 21.450.000 | AM | 6 | 50.0 | SW broadc. 13m |
| 7 | 25.600.000 | AM | 6 | 50.0 | SW broadc. 11m |
| 8 | 65.900.000 | WFM | 250 | 50.0 | FM broadc. EEU |
| 9 | 87.500.000 | WFM | 250 | 50.0 | FM broadcasting |
| Bank J | Amateur | | | | |
| 0 | 1.800.000 | USB | 3 | 1.0 | Amateur 120m |
| 1 | 3.200.000 | USB | 3 | 1.0 | Amateur 90m |
| 2 | 3.500.000 | USB | 3 | 1.0 | Amateur 75m |
| 3 | 7.000.000 | USB | 3 | 1.0 | Amateur 40m |
| 4 | 10.100.000 | CW | 3 | 0.1 | Amateur 30m |
| 5 | 14.000.000 | USB | 3 | 1.0 | Amateur 20m |
| 6 | 18.068.000 | USB | 3 | 1.0 | Amateur 17m |
| 7 | 21.000.000 | USB | 3 | 1.0 | Amateur 15m |
| 8 | 24.890.000 | USB | 3 | 1.0 | Amateur 12m |
| 9 | 28.000.000 | USB | 3 | 1.0 | Amateur 10m |

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## Memory channel assignment (V)

| Bank K | Amateur/Time standard | | | | |
|---|---|---|---|---|---|
| 0 | 50.000.000 | USB | 3 | 1.0 | Amateur 6m |
| 1 | 144.000.000 | FM | 6 | 1.0 | Amateur 2m |
| 2 | 420.000.000 | FM | 6 | 1.0 | Amateur 70cm |
| 3 | 902.00.0000 | FM | 6 | 1.0 | Amateur 33cm |
| 4 | 1240.000.000 | FM | 6 | 1.0 | Amateur 23cm |
| 5 | 5.000.000 | CW | 3 | 1.0 | Time standard |
| 6 | 10.000.000 | CW | 3 | 1.0 | Time standard |
| 7 | 15.000.000 | CW | 3 | 1.0 | Time standard |
| 8 | 20.000.000 | CW | 3 | 1.0 | Time standard |
| 9 | 25.000.000 | CW | 3 | 1.0 | Time standard |
| Bank L | Aeronautical Services | | | | |
| 0 | 2.851.000 | USB | 3 | 3.0 | Aero MWARA |
| 1 | 3.401.000 | USB | 3 | 3.0 | Aero MWARA |
| 2 | 4.651.000 | USB | 3 | 3.0 | Aero MWARA |
| 3 | 5.451.000 | USB | 3 | 3.0 | Aero MWARA |
| 4 | 6.526.000 | USB | 3 | 3.0 | Aero MWARA |
| 5 | 8.816.000 | USB | 3 | 3.0 | Aero MWARA |
| 6 | 10.003.000 | USB | 3 | 3.0 | Aero MWARA |
| 7 | 11.276.000 | USB | 3 | 3.0 | Aero MWARA |
| 8 | 13.205.000 | USB | 3 | 3.0 | Aero MWARA |
| 9 | 17.901.000 | USB | 3 | 3.0 | Aero MWARA |
| Bank M | Aeronautical Services | | | | |
| 0 | 21.925.000 | USB | 3 | 3.0 | Aero MWARA |
| 1 | 3.800.000 | USB | 3 | 1.0 | Aero LDOC |
| 2 | 15.010.000 | USB | 3 | 1.0 | Aero LDOC |
| 3 | 23.000.000 | USB | 3 | 1.0 | Aero LDOC |
| 4 | 117.975.000 | AM | 6 | 25.0 | Aero VHF |
| 5 | 118.000.000 | AM | 6 | 8.33 | Aero VHF |
| 6 | 137.000.000 | AM | 6 | 25.0 | Aero MIL |
| 7 | 230.000.000 | AM | 6 | 25.0 | Aero MIL |
| 8 | 121.500.000 | AM | 6 | 25.0 | Aero EMERGENCY |
| 9 | 243.000.000 | AM | 6 | 25.0 | Aero EMERGENCY |

EN1001  ICOM® PCR-1000 Digital Radio Control and Interface

## Memory channel assignment (VI)

| Bank N | Maritime Services | | | | |
|---|---|---|---|---|---|
| 0 | 2.000.000 | USB | 3 | 1.0 | Maritime |
| 1 | 4.063.000 | USB | 3 | 1.0 | Maritime |
| 2 | 6.200.000 | USB | 3 | 1.0 | Maritime |
| 3 | 8.195.000 | USB | 3 | 1.0 | Maritime |
| 4 | 12.330.000 | USB | 3 | 1.0 | Maritime |
| 5 | 16.460.000 | USB | 3 | 1.0 | Maritime |
| 6 | 18.780.000 | USB | 3 | 1.0 | Maritime |
| 7 | 22.000.000 | USB | 3 | 1.0 | Maritime |
| 8 | 156.025.000 | FM | 15 | 25.0 | Maritime VHF |
| 9 | 160.625.000 | FM | 15 | 25.0 | Maritime VHF |
| Bank O | Miscellaneous | | | | |
| 0 | 26.565.000 | AM | 6 | 10.0 | CB |
| 1 | 46.750.000 | WFM | 250 | 250 | TV Band I |
| 2 | 180.750.000 | WFM | 250 | 250 | TV Band III |
| 3 | 471.250.000 | WFM | 250 | 250 | TV Band IV |
| 4 | 7.335.000 | CW | 3 | 0.1 | Time standard |
| 5 | 30.010.000 | AM | 6 | 20.0 | Fixed services |
| 6 | 40.010.000 | AM | 6 | 20.0 | Fixed services |
| 7 | 162.400.000 | FM | 15 | 25.0 | NOAA Weather |
| 8 | 5.505.000 | USB | 3 | 3.0 | Shannon Volmet |
| 9 | 1090.000.000 | AM | 6 | 1.0 | SSR Aircraft |

EN1001 ICOM® PCR-1000 Digital Radio Control and Interface

## Display legend (I)

| Display | ON | OFF |
|---|---|---|
| Attenuator | ATT | att |
| Automatic Gain Control | AGC | agc |
| NB | NB | nb |

| | |
|---|---|
| Write pending | ! |
| No write to ROM memory | ' |
| Write failed | X |
| Memory cleared | X |
| No channels to scan | + |
| Channel empty | ? |

```
123.125.000 A58 S48
                    7A
_ _ - - - ■ ■ ■
att a9c nb
AM 15k   25.0  ■   VFO
```
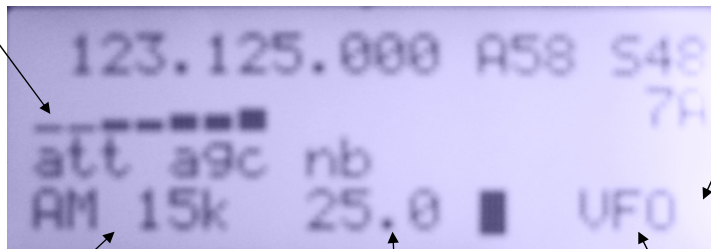
| Display | Mode | Filter |
|---|---|---|
| LSB 3k | LSB | 2.8 kHz |
| LSB 6k | LSB | 6 kHz |
| USB 3k | USB | 2.8 kHz |
| USB 6k | USB | 6 kHz |
| AM 3k | AM | 2.8 kHz |
| AM 6k | AM | 6 kHz |
| AM 15k | AM | 15 kHz |
| AM 50k | AM | 50 kHz |
| CW 3k | CW | 2.8 kHz |
| CW 6k | CW | 6 kHz |
| FM 6k | FM | 6 kHz |
| FM 15k | FM | 15 kHz |
| FM 50k | FM | 50 kHz |
| WFM 50 | WFM | 50 kHz |
| WFM 230 | WFM | 230 kHz |

| Display | Small step in kHz* | Remarks |
|---|---|---|
| 0.1 | 0.1 | |
| 1.0 | 1.0 | |
| 3.0 | 3.0 | |
| 5.0 | 5.0 | |
| 9.0 | 9.0 | |
| 10.0 | 10.0 | |
| 12.5 | 12.5 | |
| 20.0 | 20.0 | |
| 25.0 | 25.0 | |
| AIR | 8.333 | activated only when inside 118-137 MHz |
| 50.0 | 50.0 | |
| 100 | 100 | |
| 250 | 250 | |
| SCAN | | Memory scan active |

*normal step; big step = 1 MHz

| Display | Tuning mode |
|---|---|
| VFO | normal step |
| vfo | micros step: 1 kHz/10 Hz |
| A0 - O9 | Memory Channel |

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EN1001 ICOM® PCR-1000 Digital Radio Control and Interface

## Display legend (II)

| Display | Audio volume |
|---|---|
| A00 - AFF (Steps 4) | active |
| a00 | muted and last value stored |

| Display | Squelch |
|---|---|
| S00 - SF8 (Steps 8) | Squelch value |
| s00 | Squelch open and last value stored |

Frequency in Hz

```
123.125.000 A58 S48
                    7A
_ _ - - - ■ ■ ■
att a9c nb
AM 15k   25.0  ■   VFO
```
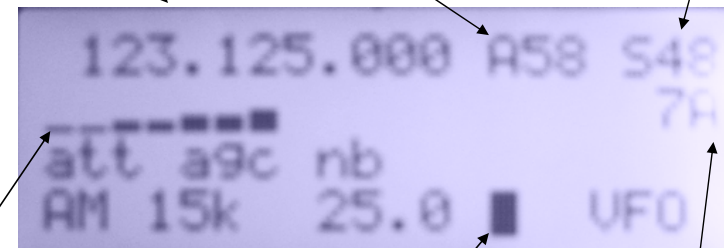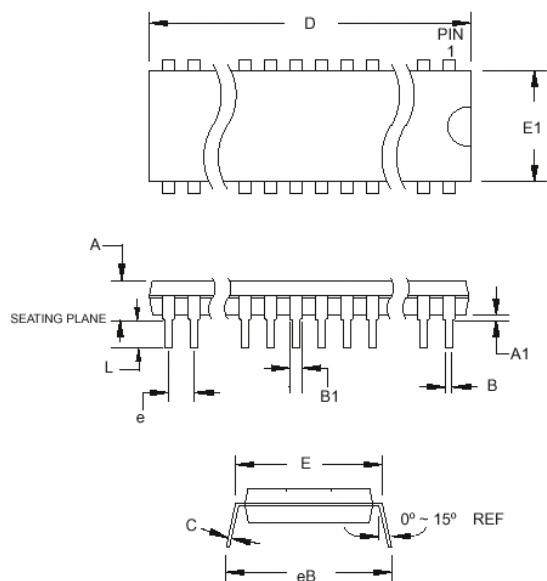
Signal strength graphics display

Down counter until released from scan stop

Signal strength 00 - FF

EN1OO1   ICOM® PCR-1000 Digital Radio Control and Interface

## Package



### COMMON DIMENSIONS
(Unit of Measure = mm)

| SYMBOL | MIN | NOM | MAX | NOTE |
|---|---|---|---|---|
| A | – | – | 4.826 | |
| A1 | 0.381 | – | – | |
| D | 52.070 | – | 52.578 | Note 2 |
| E | 15.240 | – | 15.875 | |
| E1 | 13.462 | – | 13.970 | Note 2 |
| B | 0.356 | – | 0.559 | |
| B1 | 1.041 | – | 1.651 | |
| L | 3.048 | – | 3.556 | |
| C | 0.203 | – | 0.381 | |
| eB | 15.494 | – | 17.526 | |
| e | 2.540 TYP | | | |

Notes:   1. This package conforms to JEDEC reference MS-011, Variation AC.
2. Dimensions D and E1 do not include mold Flash or Protrusion.
Mold Flash or Protrusion shall not exceed 0.25 mm (0.010").



EN 1001-8-003
0833

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## Order Information

| Partnr. | Description | Package |
|---|---|---|
| EN1001-8-003 | PCR-1000 Digital Radio Control Interface | DIP40 |