

PXdragon DR-9400

Practical Guide

SCS GmbH & Co. KG, October 2025

FW-Version 1.00.00

Thank you for choosing a PXdragon modem. The new DR-9400 modem essentially replaces the DR-7400 modem and is largely compatible with it, but includes additional features such as a WLAN interface and generally available Bluetooth interface. Moreover, the powerful floating-point processor allows the use of more sophisticated algorithms. For example, significant parts of the PACTOR-3 and PACTOR-4 algorithms have been redesigned and implemented, optimizing them through extensive use of the processor's SIMD capabilities (fast parallel processing). The new architecture also facilitates easier customization of PACTOR modes to meet specific customer requirements, such as broader channels.



Open-Source Materials (Notices & Source Code)

This product contains open-source software components. The corresponding source code for these components is available on request for at least three years after distribution, either electronically or on physical media for a cost no more than the distribution fee.

Requests: info@wimo.com

Please include "Open Source Request PXdragon DR-9400" in the subject line.

Firewall

The modem must be operated behind a firewall! Port 3000 on the modem is open, so the modem can be controlled through port 3000.

LEDs

- P4/P3** Indicates PACTOR-4 or PACTOR-3 operation.
- P2/P1** Indicates PACTOR-2 or PACTOR-1 operation.
- PX/RPR** PX indicates PACTOR variants beyond P4 (currently not available). RPR indicates *Robust Packet Radio* operation.
- AUD/OVR** AUD indicates that there is sufficient audio input level available.
OVR indicates that the audio input level from the receiver (RX) is too high.
- TFC/ERR** During PACTOR connection, it shows whether a packet or a short acknowledgment was correctly received or if an error occurred (prompting a request for retransmission).

In Standby mode, it indicates whether the channel is free or busy. If the TFC LED (green) is on, the channel is currently occupied (*Channel-Busy-Detector*).
- RCV/PTT** RCV shows that a packet or acknowledgment is being received.
PTT shows that transmission is ongoing.
- CON/SND** CON indicates that you are connected (also in PR/RPR).
SND indicates that you are connected and the PACTOR transmit direction is set to sending packets, meaning you can send data yourself (Half-duplex status).

The Bluetooth and USB LEDs are self-explanatory and indicate traffic on their respective ports. In the prototypes, the USB LED is not connected.

The **Power LED** indicates when the modem has finished booting: it turns **green**.

Rear Panel:



First Startup

The modem cannot be powered directly from the USB-C connector! It requires an external voltage supply of 12 to 24 volts at the 2-pin power socket. At 13.8 V, a current of 1 A should be available.

Upon powering on, the modem takes approximately 20 seconds to boot up. During this process, the Power LED remains red and turns green once the modem is ready for operation. If the LED stays red, it indicates that the boot sequence was not completed successfully.

If you want to communicate with the modem quickly, connect the modem to your network with a patch cable while it is powered off, then switch it on.

Next, after the modem has booted completely (Power LED green), open a command prompt (e.g. Windows Terminal) and enter the command:

telnet pxdragon-lan 3000

A Telnet session should open in which you can enter commands. For example, type help (and press Enter) to see a list of all the modem's commands.

You also can use

ping pxdragon-lan

on a Windows Terminal if you want to find out the local **IP address of your modem**.

Interfaces

To connect with the modem, four different interfaces are available:

- LAN
- WLAN
- USB
- Bluetooth

An external Wi-Fi/Bluetooth USB stick is required for Wi-Fi and Bluetooth!

The package includes a stick with a Realtek RTL8821CU chipset that supports both Wi-Fi and Bluetooth.

Please insert the stick while the unit is powered off. The modem is not fully hot-plug capable.

The net: menu

The net: menu allows configuration and status output for the LAN and Wi-Fi interfaces. From the cmd: menu (main menu), it is accessed with the command **net**. All commands of the net menu can also be executed from the cmd: menu by prefixing them with **net**, e.g., **net ip**.

All parameters of the net: menu are immediately stored in internal non-volatile memory, in a dedicated area for the network configuration. Apart from the WLAN parameter (0 or 1), they do not need to be explicitly made permanent with the SAP command.

```
net: h
```

```
Command key words:
```

```
=====
```

```
COUNTRY Help  IPaddress MAC IPLan  HOSTname  IPWlan  
Gateway MODE  MAsk          DNS Quit   SER2net   SSID+passwd  
SAP          WLAN
```

```
For more information type: Help <CMD> (eg: H Help)
```

```
net:
```

COUNTRY

Allows you to set the ISO country code. **This is necessary in order to obtain, where applicable, higher transmit power and more channels than in the factory setting (country code 00).** In the factory setting, transmit power is limited to 10 mW EIRP and only channels 1–11 are supported. The modem generally uses only channels in the 2.4 GHz band, regardless of the country code setting.

Examples of country codes: US, DE.

A list of ISO-3166 country codes can be found on the internet.

Example: **COUNTRY US**

IPaddress

Allows you to view the currently configured IP addresses:

```
net: ip

lan: 192.168.0.148
wlan: 192.168.0.82
```

Example: **IP**

MAC

Allows you to view the interfaces' MAC addresses.

```
net: mac

MAC address(es) :
lan   : d8:3a:dd:94:00:dd
wlan  : e8:4e:06:b1:15:32
```

Example: **MAC**

IPLan

Allows you to view or assign a new static LAN IP address.

```
net: ipl

*** STATIC LAN IP ADDRESS: 192.168.0.222
```

Example: **IPL 192.168.0.111**

The static IP address only takes effect when net *MODE* is set to *STATIC*; see below. In DHCP operation this address has no effect.

Changes only take effect after rebooting the modem.

IPWlan

Allows you to view or assign a new static Wi-Fi IP address.

```
net: ipwl

*** STATIC WLAN IP ADDRESS: 192.168.0.223
```

Example: **IPWL 192.168.0.112**

The static IP address only takes effect when net MODE is set to STATIC; see below. In DHCP operation this address has no effect.

Changes only take effect after rebooting the modem.

HOSTname

Allows you to change the modem's base host name. The modem automatically appends **-lan** and **-wlan** to the base host name, so the defaults for LAN and Wi-Fi are **pxdragon-lan** and **pxdragon-wlan**.

```
net: host
```

```
*** HOSTNAME: pxdragon
```

If the LAN and/or Wi-Fi interface is active, you can, for example, use the ping command to check whether the modem can be reached. Example in a Windows Terminal:

```
ping pxdragon-lan
```

Example: **HOST myhostname**

Gateway

Allows you to set the IP address of the default gateway. This is usually the address of the next router. This setting is only relevant if DHCP operation is disabled; see net MODE below.

```
net: Gateway
```

```
*** GATEWAY IP ADDRESS: 192.168.0.1
```

Example: **G 192.168.0.2**

MOde

Allows switching between DHCP and static IP operation. The default is DHCP. The arguments STATIC and DHCP are accepted. After a change, you must reboot the modem for it to take effect.

```
net: MO
```

```
*** MODE: DHCP
```

In static mode (and only then), the commands **IPLan**, **IPWlan**, **Gateway**, **DNS** and **MASK** become relevant.

Example: **MO STATIC**

MAsk

Allows you to set the subnet mask. This setting is only relevant if DHCP operation is disabled; see net MODE below.

```
net: mask
```

```
*** NETMASK: 255.255.255.0
```

Example: **MASK 255.255.0.0**

DNS

Allows you to set the IP address of the DNS server. In the simplest case, this is the address of the next router. This setting is only relevant if DHCP operation is disabled; see net MODE command below.

```
net: dns
```

```
*** NAMESERVER IP ADDRESS: 192.168.0.1
```

Example: **DNS 192.168.0.2**

SER2net

Allows you to view the port on which telnet operation with the modem is possible. This value cannot be changed at present and is fixed at port 3000.

```
net: ser
```

```
ser2net port: 3000
```

Example: **SER**

SSID+passwd

Allows you to enter the SSID (network name) and password to access the Wi-Fi, i.e., to set up Wi-Fi.

```
net: ssid MySSID MyPasswordXyz
```

```
*** WLAN SSID and PASSWORD SET!
```

```
*** USE WLAN 1 COMMAND TO ACTIVATE WLAN NOW!
```

```
*** USE SAP COMMAND FOR MAKING WLAN 1 SETTING PERSISTENT!
```

```
*** CURRENT WLAN SSID: MySSID
```

Example: **SSID MySSID MyPasswordXyz**

Note that WPA2 user names and passwords are case-sensitive.

After the *SSID* command, you can immediately issue the command *WLAN 1*. It activates the Wi-Fi interface and sets the WLAN parameter to 1. After a few seconds, the Wi-Fi interface

should obtain its own IP address (normally from the DHCP server); you can view it with the IP command.

IMPORTANT: After entering the *WLAN 1* command, you must run the *SAP* (Save All Parameters) command to make this setting permanent so that the Wi-Fi interface remains available after the next reboot.

If no Wi-Fi IP address is assigned, please power the modem off and on again. The connection to the Wi-Fi network should then be established reliably.

This command only works if a Wi-Fi feature license has been loaded into the modem.

WLAN

This command can be used to switch the Wi-Fi interface on or off. Parameter “1” turns the Wi-Fi interface on. Parameter “0” switches the Wi-Fi interface off.

This parameter must be made permanent with the SAP command if it is to retain its value after the next reboot.

Example: ***WLAN 1***

This command only works if a Wi-Fi feature license has been loaded into the modem.

LAN Interface

For network (LAN) operations, connect the modem to your network via the RJ45 port using a router or switch. **Connect the cable while the modem is switched off!** Per default setting, the modem operates with DHCP and obtains an IP address from a DHCP server within the connected network.

If you already have a connection through another interface, you can always query the IP address with the command **net ip** (from the **cmd:** menu).

The LAN IP address will be displayed with the prefix **lan:** indicating its source. Normally, this assigned IP address can also be viewed in your router settings.

```
net: ip

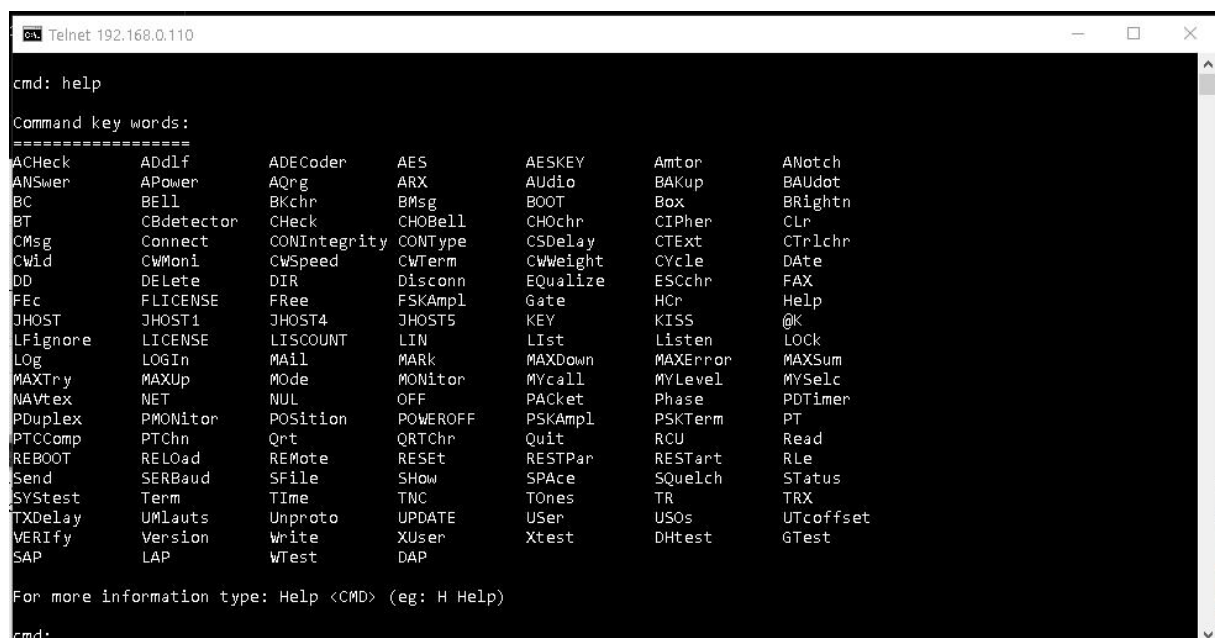
lan: 192.168.0.110
wlan: 192.168.0.82
```

To establish a Telnet connection to the modem under Windows, you can use the following command in your command prompt:

```
telnet pxdragon-lan 3000 (using the standard hostname)
```

or

```
telnet 192.168.x.y 3000 (using directly the IP address)
```



```
Telnet 192.168.0.110

cmd: help

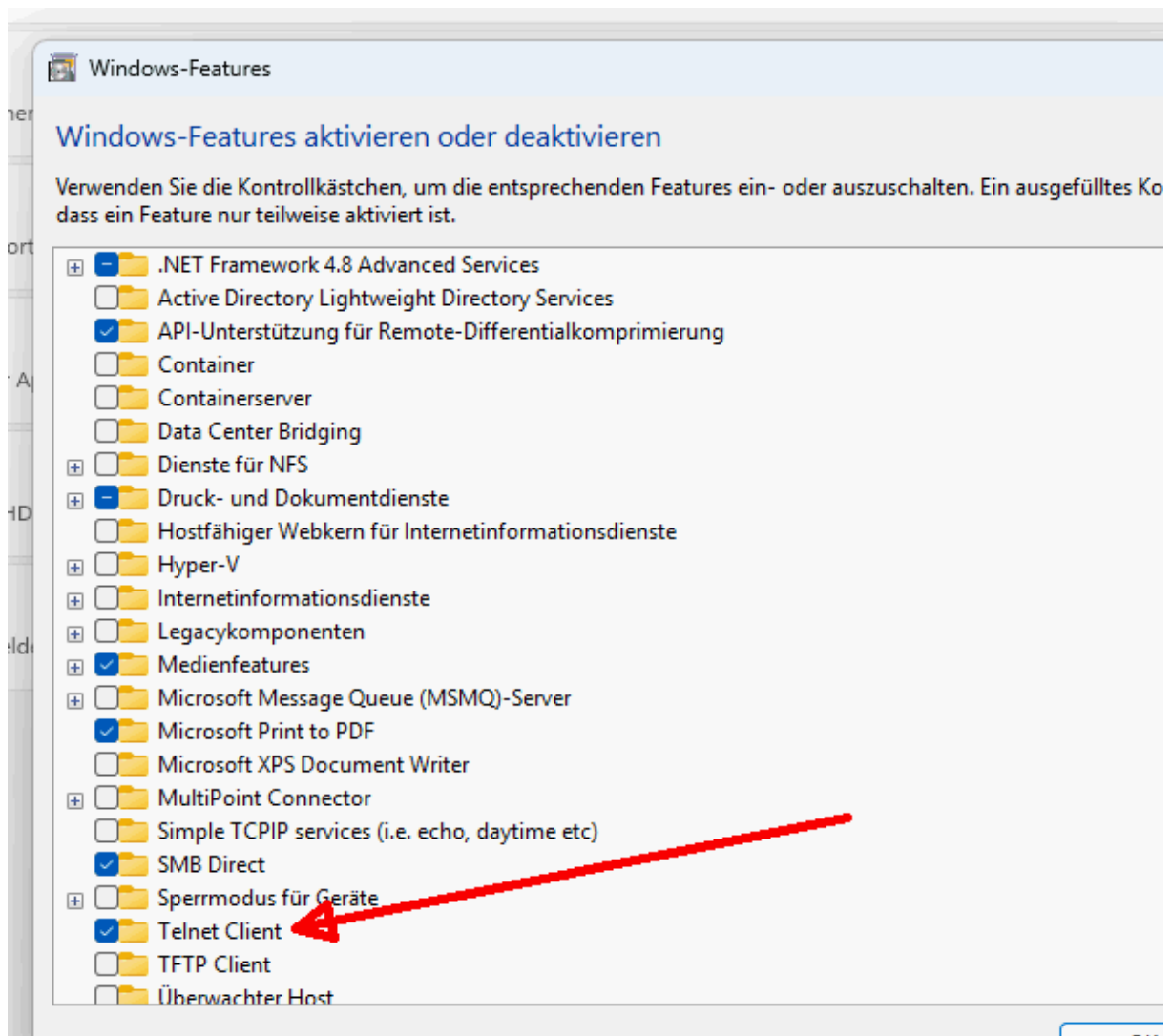
Command key words:
=====
ACHECK      AddIf      ADECODER   AES         AESKEY     Amtor      ANotch
ANSWER      APOW       AQNG       ARX         AUDIO      BAKup      BAUDot
BC          BELL       BKchr      BMSG       BOOT       Box        BRighTn
BT          CBdetector CHECK       CHOBell    CHOchr     CIPher     CLn
CMsg        Connect   CONIntegrity CONTYPE    CSDelay    CText     CTRlchr
CWid        CWMoni    CWSpeed    CWTerm     CWeight    CYcle      DATE
DD          DELETE    DIR        Disconn    EQualize   ESCchr     FAX
FEC         FLICENSE   FREE       FSKAmpl    Gate       HCr        Help
JHOST       JHOST1    JHOST4     JHOST5     KEY        KISS       @K
LFignore    LICENSE   LISCOUNT LIN         List       Listen     Lock
LOG         LOGIn     MAIL       MARK       MAXDown    MAXError   MAXSum
MAXTry      MAXUp     Mode       MONitor    MYcall     MYLevel    MYSelc
NAVtex      NET       NUL        OFF         Packet     Phase      PDTimer
PDuplex     PMONitor  POSITION    POWEROFF   PSKAmpl    PSKTerm    PT
PTCComp     PTChn     Qrt        QRTChr     Quit       RCU        Read
REBOOT      REload    REMote     RESet      RESTPar    RESTart    RLe
Send        SERBaud   Sfile      Show       SPace      SQuelch    STatus
SYStest     Term      Time       TNC        Tones      TR         TRX
TXDelay     Umlauts   Unproto    UPDATE     User       USOs       UTCOffset
VERIfy      Version   Write      XUser      Xtest      DHtest     GTest
SAP         LAP       WTest      DAP

For more information type: Help <CMD> (eg: H Help)

cmd:
```

This allows you to access to the well-known SCS modem command interface.

Please note that Telnet is a Windows 'feature' which might have to be enabled prior first use, according to screenshot below.



Software like P4config.exe, SCSmail, or Winlink Express can be operated directly via Telnet. Inputting the IP address (or hostname if the software allows that) and port (usually 3000) is also required here. It is not possible to change this port on the modem. The configured port can be displayed with the command **net ser2net**.

USB Interface

To operate the modem like the old DR-7X00 modems over a virtual COM port via USB, you need to install a new SCS-USB driver.

First, completely delete or uninstall the previous SCS-USB driver. You can do this in the Device Manager by selecting "Uninstall device" or in the Apps & Features section of Windows by searching for SCS and removing the driver.

Then, proceed with installing the new driver:

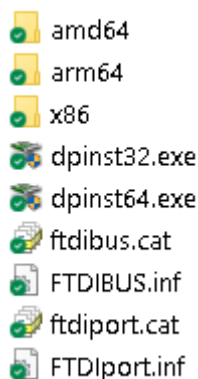
Download the entire ZIP archive of the driver from the following URL:

https://www.dropbox.com/scl/fi/lzk75qorz8zuar8r7guzx/SCS-FTDI_TEST_-2024-06-21_signed-co-3.zip?rlkey=1sklflteh7ynewf97grk02fl&st=phxygf2n&dl=0

Please disconnect all modems from the computer before installing the driver!

Locally extract the ZIP archive. In the main directory of the archive, you will find the executable file **dpinst64.exe**.

Name



Run **dpinst64.exe** as an **Administrator** and follow the instructions.

This installs the driver. There is only a 64-bit version available, as Microsoft no longer supports the 32-bit version. All old SCS modems are supported by this driver, which also resolves issues with the previous driver on Windows 11.

After connecting the DR-9400, a virtual COM port will be created:



This virtual COM port can be used as usual in terminal software and other modem-related software. The DR-9400 behaves essentially like a DR-7400, so it should be compatible with all standard applications.

WLAN Interface

To set up WLAN, you need to have access to the modem's command interpreter. Additionally, the modem must have a feature license for WLAN:

```
cmd: flicense
FLICENSE: 100000C756129223 MFCFQQIDDDFDCBFACC12
LICENSED FEATURES:
-----
- WLAN option
- BLUETOOTH option
- AES-256 option V2 (+dynamic key)
cmd:
```

To permanently set up WLAN, three commands must be entered:

net ssid MySSID MyPassword

- **MySSID** is the SSID of the WLAN network you want to connect the modem to.
- **MyPassword** is the WPA password for this network.

2. Enable WLAN generally with:

net wlan 1

3. For permanent WLAN availability (after powering off and back on), make this setting persistent using:

SAP

(Save All Parameters)

After a few seconds, the WLAN interface should activate and receive an IP address from the DHCP server in the network. This can be queried with:

net ip

(see above)

```
cmd: net ip
lan: 192.168.0.148
wlan: 192.168.0.82
```

The **wlan:** address is the IP address of the modem in the WLAN.

Telnet operation over port 3000 can also be performed using this address. Of course, Winlink Express software, for example, can also be operated via this address.

Finally use the **net COUNTRY** command (see above) to set the modem to the appropriate power level and channel set for your country / regulatory domain.

Bluetooth Interface

A Bluetooth feature license is required for Bluetooth operation, see the WLAN section above.

You do not need a so-called passkey for pairing.

After powering on, the DR-9400 modem always appears as a Bluetooth device named **SCS PXdragon 9400 on BT-USB**.

On Windows, pairing is typically started with:

1. Right-click the **Bluetooth Icon in the System Tray**
2. Select **Bluetooth and Other Devices**
3. Choose **Add Bluetooth or Another Device**
4. Select **SCS PXdragon 9400 on BT-USB**
5. As soon as the pairing message appears, please briefly **press the reset button** and then click on **CONNECT**.

This process **creates two new virtual COM ports**. It is usually necessary to test which port is the "out-going" port, as it is not always the higher-numbered one.

Communication with the modem over this port can be established similarly to how it is done over the USB-COM port.

Parallel Operation of Interfaces

In general, the interfaces are operated in parallel in the modem: The modem outputs are sent simultaneously to all available and connected interfaces. Inputs from all interfaces are forwarded to the command interpreter as soon as they become available, without the command interpreter being able to differentiate the source. Therefore, for example, only one Hostmode software can be run on the modem at a time. All other interfaces should either remain closed or at least no inputs should occur from them, as these would otherwise interfere with the Hostmode operation.

Only a single Telnet client is supported. If multiple Telnet clients connect to the modem simultaneously, they will not have access to the command interpreter.

Connection to HF Transceiver

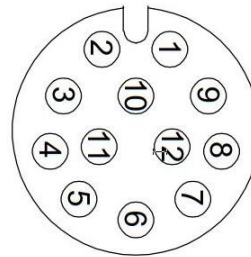
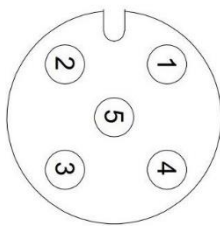
The HF transceiver can be connected in the same way as with the DR-7X00 modems. The pinout of the new sockets on the DR-9400 corresponds to the pinout of the respective DIN sockets on the DR7800 modems.

If an adapter to DIN sockets is included, existing cables for transceivers can be reused without modification (“Plug’n Play”). This applies to both the 5-pin Audio/PTT socket and the 13-pin Transceiver Control socket.

The modem also accepts power supply from the transceiver (Pin 5). The transceiver must be able to provide sufficient current (12 V, 1 A).

If only cable harnesses with open ends are supplied, the corresponding cables must be assembled manually.

When looking at the connectors **from the rear of the modem**, the following pin assignments apply.



Modem Pin Assignment

(see socket labeling above)

Audio/PTT (5-pin)

- **Pin 1:** Audio from modem (TX audio)
- **Pin 2:** Ground
- **Pin 3:** PTT output (open drain)
- **Pin 4:** Audio from transceiver (RX audio)
- **Pin 5:** Optional power input 12–24 V, 1 A at 13.8 V

TRX Control

- **Pin 1:** TxD TTL
- **Pin 2:** RTS V.24
- **Pin 3:** TxD V.24
- **Pin 4:** CTS V.24
- **Pin 5:** CTS TTL
- **Pin 6:** Icom data line (CI-V)
- **Pin 7:** Not connected
- **Pin 8:** RxD V.24
- **Pin 9:** TxD TTL
- **Pin 10:** RTS TTL
- **Pin 11:** Not connected
- **Pin 12:** Ground

These pin numbers are 100% compatible with the pin numbers of the old DR-7X00 DIN connectors. So, if you want to solder your own cables, you simply need to connect Pin 1 to Pin X of the new connector to Pin 1 to Pin X of the corresponding DIN plug or socket.

The only exception: Pin 13 of the DIN socket must be connected to Pin 12 of the new connector. Pin 12 of the DIN socket remains unconnected.



Pinout of old (DR-7X00) DIN connectors is shown **from the rear side** as well.

Simple Terminal Operation

For simple terminal use, P4config.exe can be used, for example:

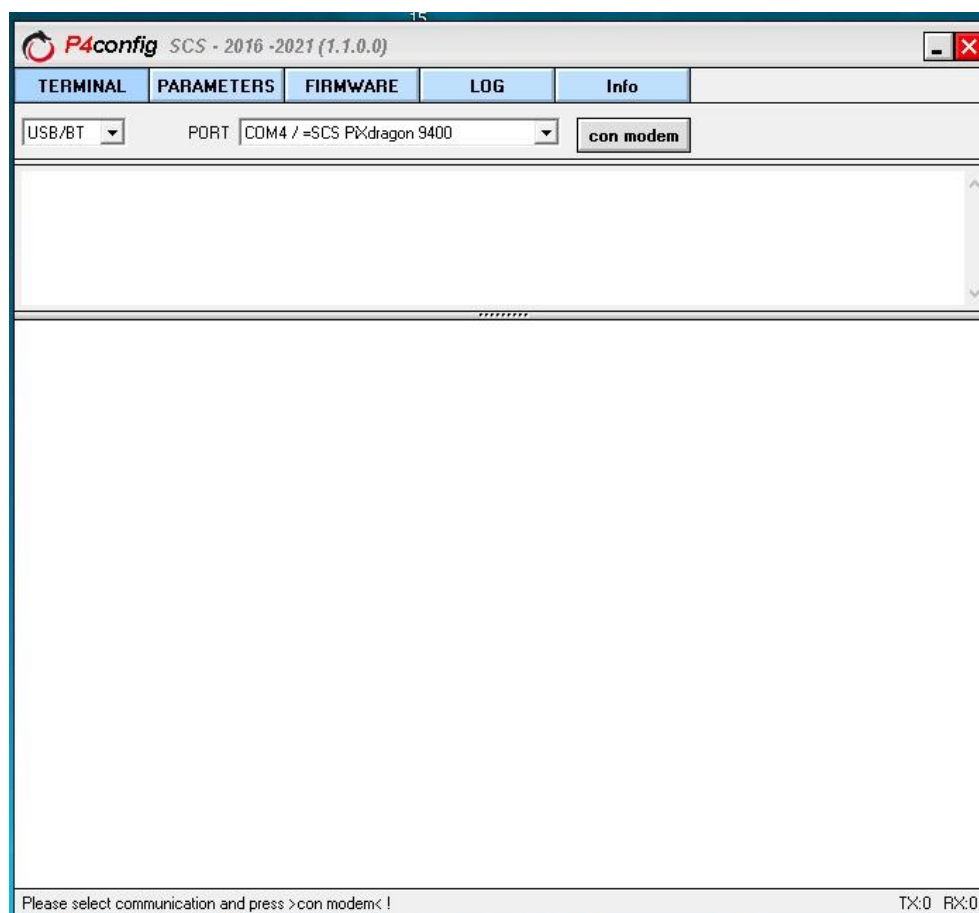
https://www.p4dragon.com/download/SCS_P4config%20V1.1.zip

It is sufficient to unpack the zip file and start the exe file.

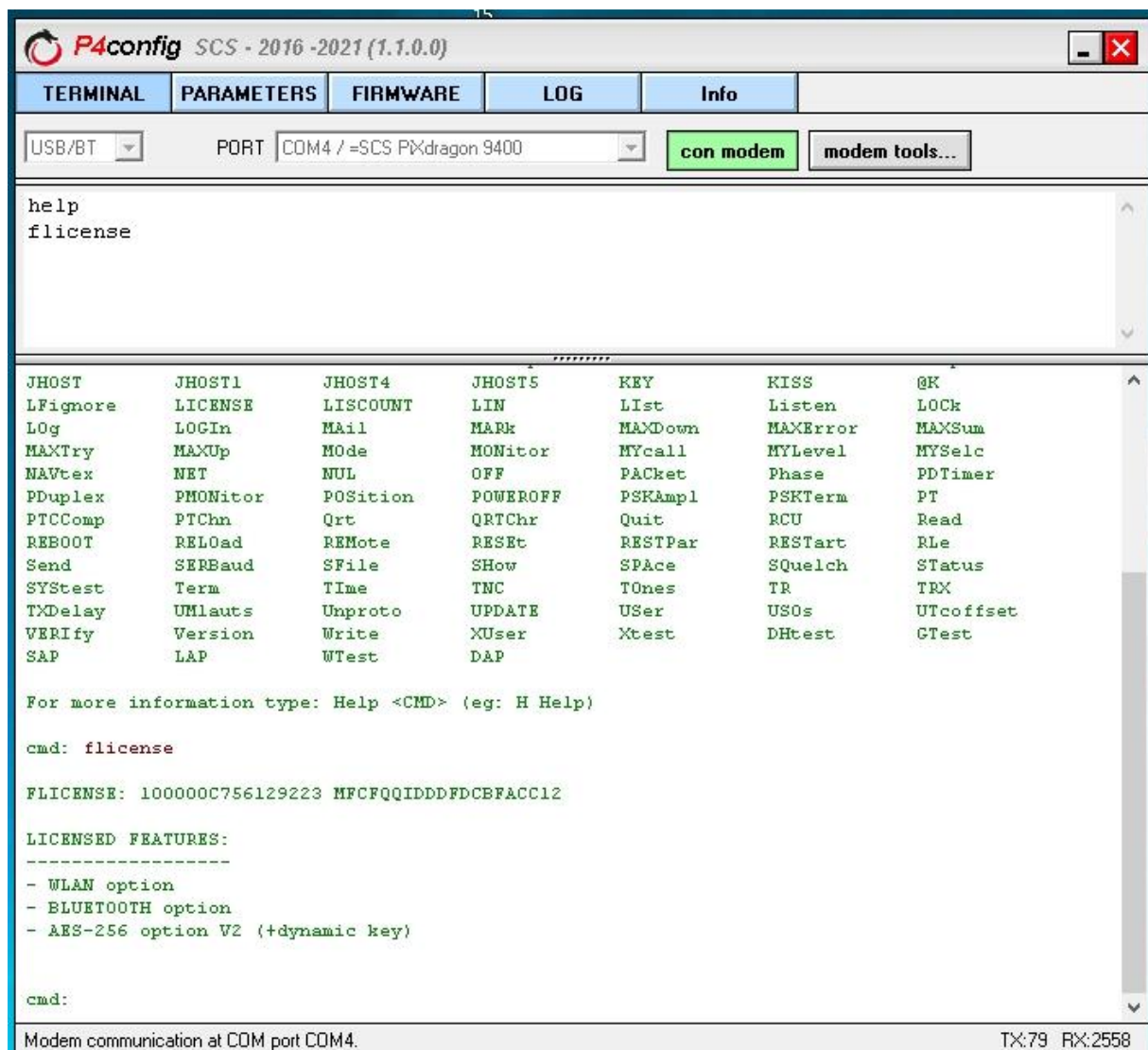
Alternatively, CoolTerm is a good option as it allows recording of data or sending files:

<https://freeware.the-meiers.org/>

When using the SCS software P4config.exe, you must first choose the communication port through which the modem should be addressed.



Then click on **con modem**. The **con modem** field should turn green, indicating that a connection with the modem has been successfully established. After this, the simple terminal operation can be selected using the field or tab labeled "TERMINAL."



In the upper window, terminal commands can be entered (modem's **cmd: mode**). A list of available commands can be displayed by typing **help**<Enter>.

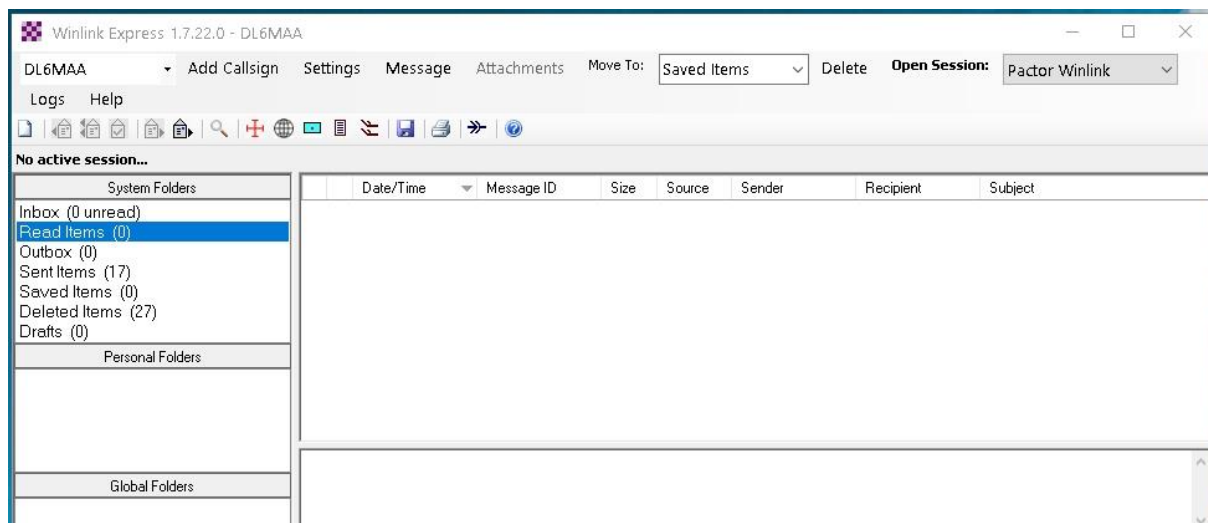
For example, the command **flicense** shows the current feature license status. It can also be used to install a new license.

Winlink Operation

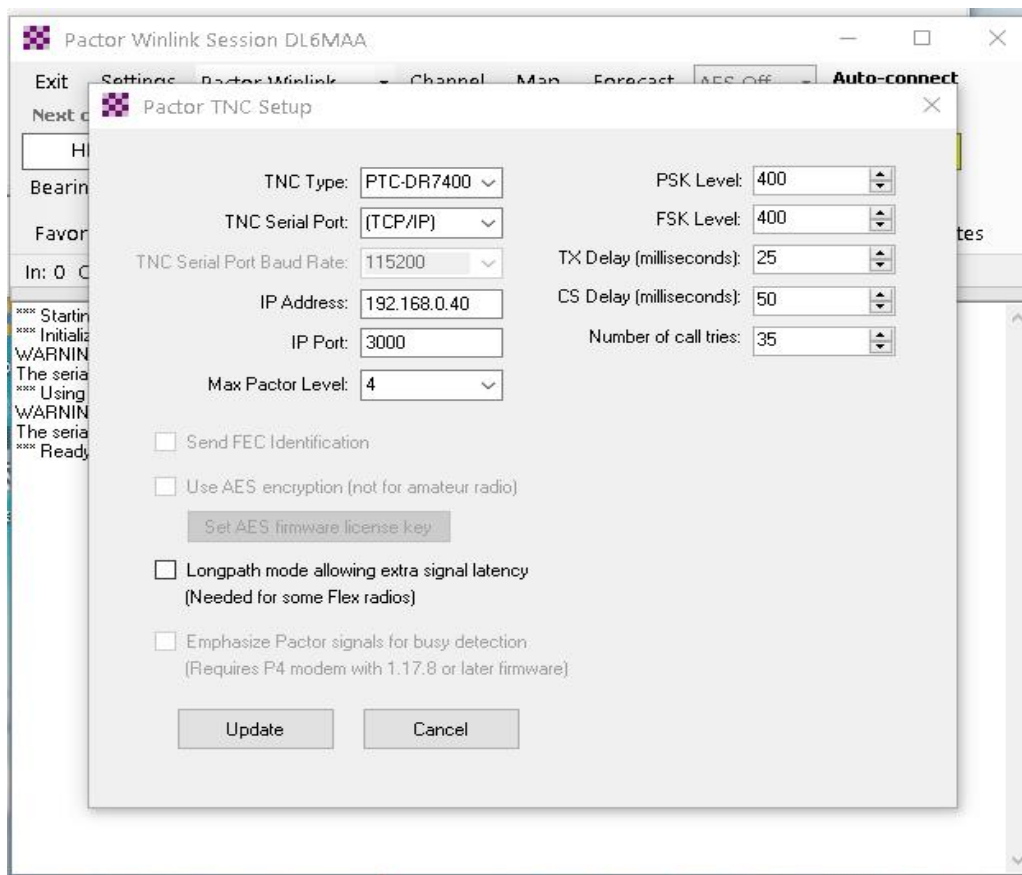
To operate Winlink, Winlink Express must be installed, and a Winlink account is required. Details can be found on the Winlink website:

<https://winlink.org/>

To exchange emails, start by launching the Winlink Express software:



In the upper right corner, select "Pactor Winlink" under "Open Sessions."

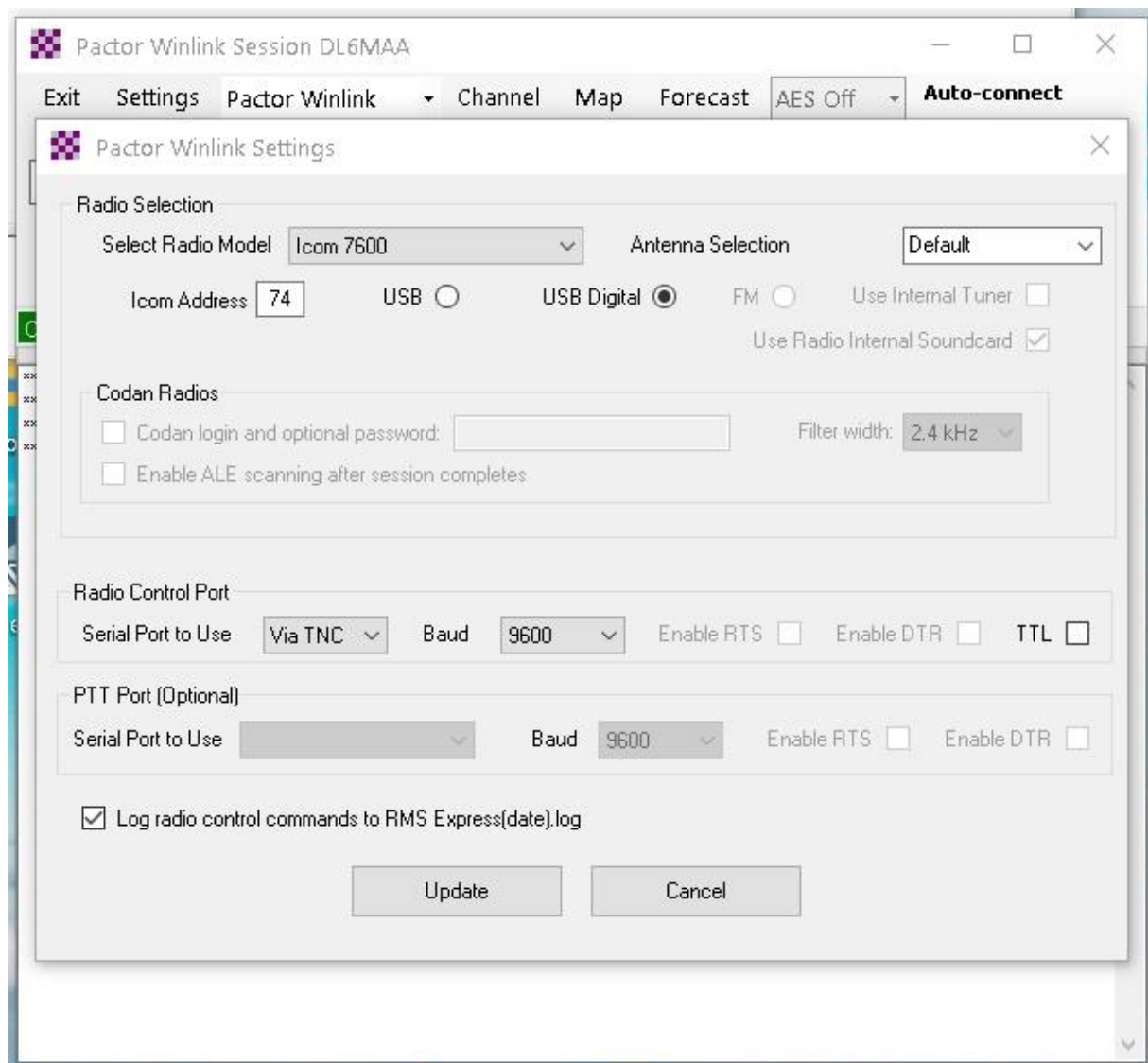


After waiting briefly, you can configure the modem and communication port through Settings -> "Pactor TNC Setup." Select "PTC-DR7400" as the Modem; the DR-9400 is compatible with DR-7400.

For the "TNC Serial Port," you might use the LAN Telnet port of the modem, i.e., enter the LAN IP address under "IP Address" and set the "IP Port" to 3000. Choose "4" for "Max Pactor Level." On the right side, additional settings can be made, such as audio output levels (PSK and FSK) and TX Delay/CSD.

Once all settings are configured, click on "Update."

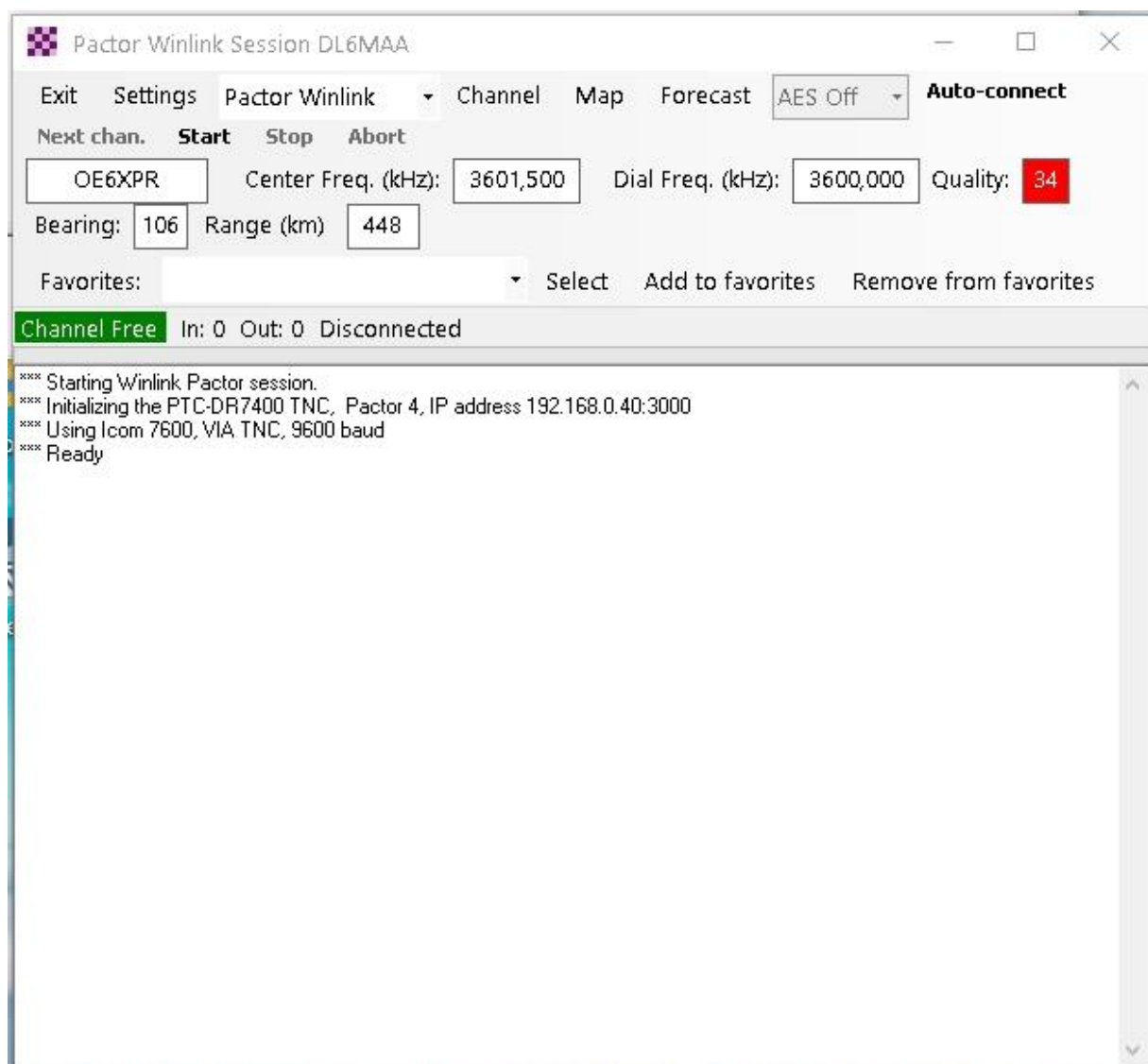
Additional settings for frequency control of the connected radio can be adjusted via Settings -> "Radio Settings."



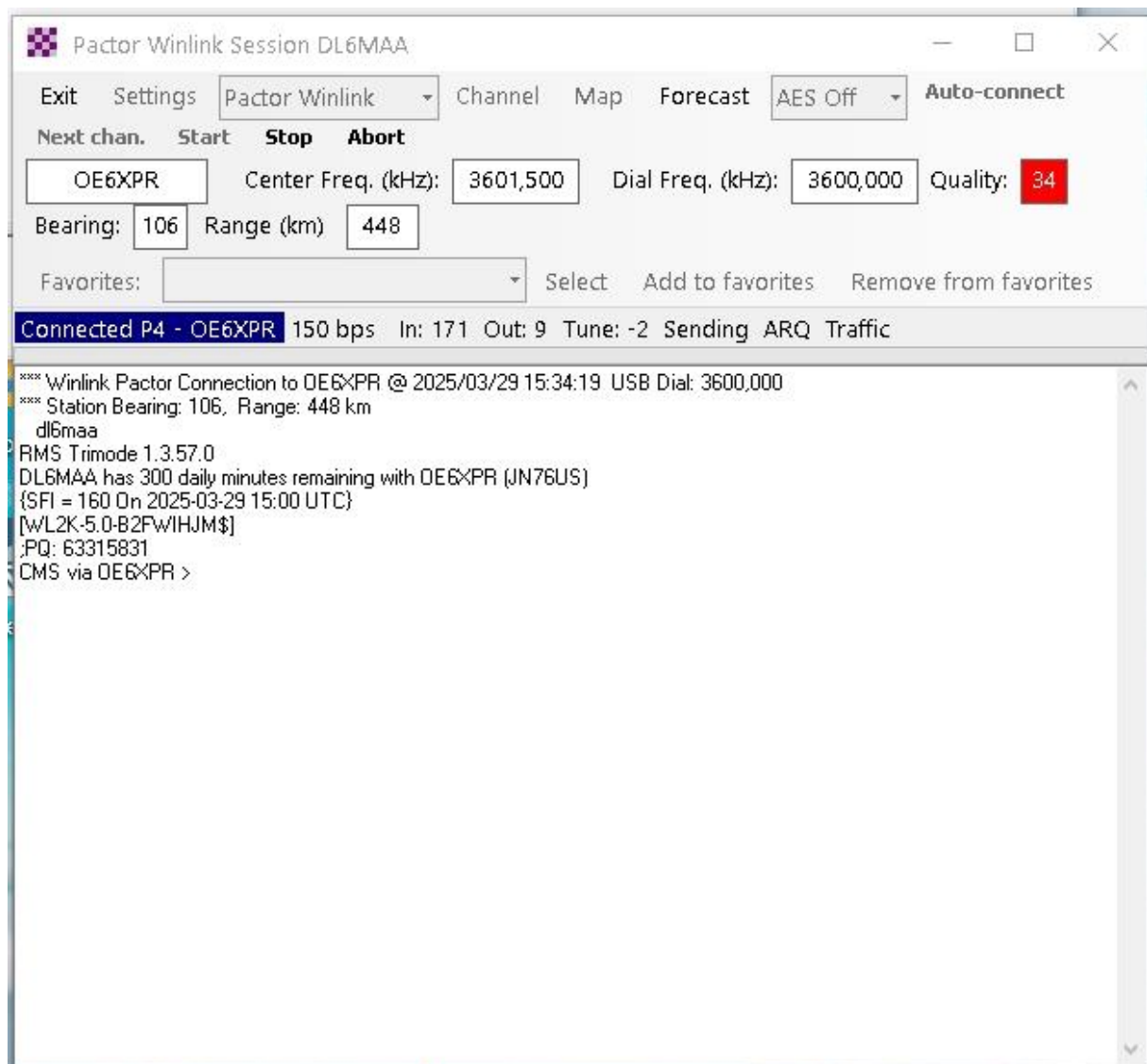
If you want to work through the TRX-Control port of the attached DR-9400 modem, set "Serial Port to Use" to "Via TNC." The baud rate must match the setting in the radio. In the example above, an IC-7700 (compatible with IC-7600) with address 74 Hex and 9600 Bit/s is used. After making this adjustment, click on the field "Update" again.

The session is now ready for a PACTOR connection to a Winlink RMS. By clicking on the channel dropdown menu, you can see available Winlink node stations.

The small field "Channel Free" or "Channel Busy" indicates whether the modem currently detects channel occupation. Normally, only attempt a connection with "Start" when the channel is free.



A connection process looks approximately like this:



The connection will be automatically terminated by the Winlink RMS after exchanging emails.

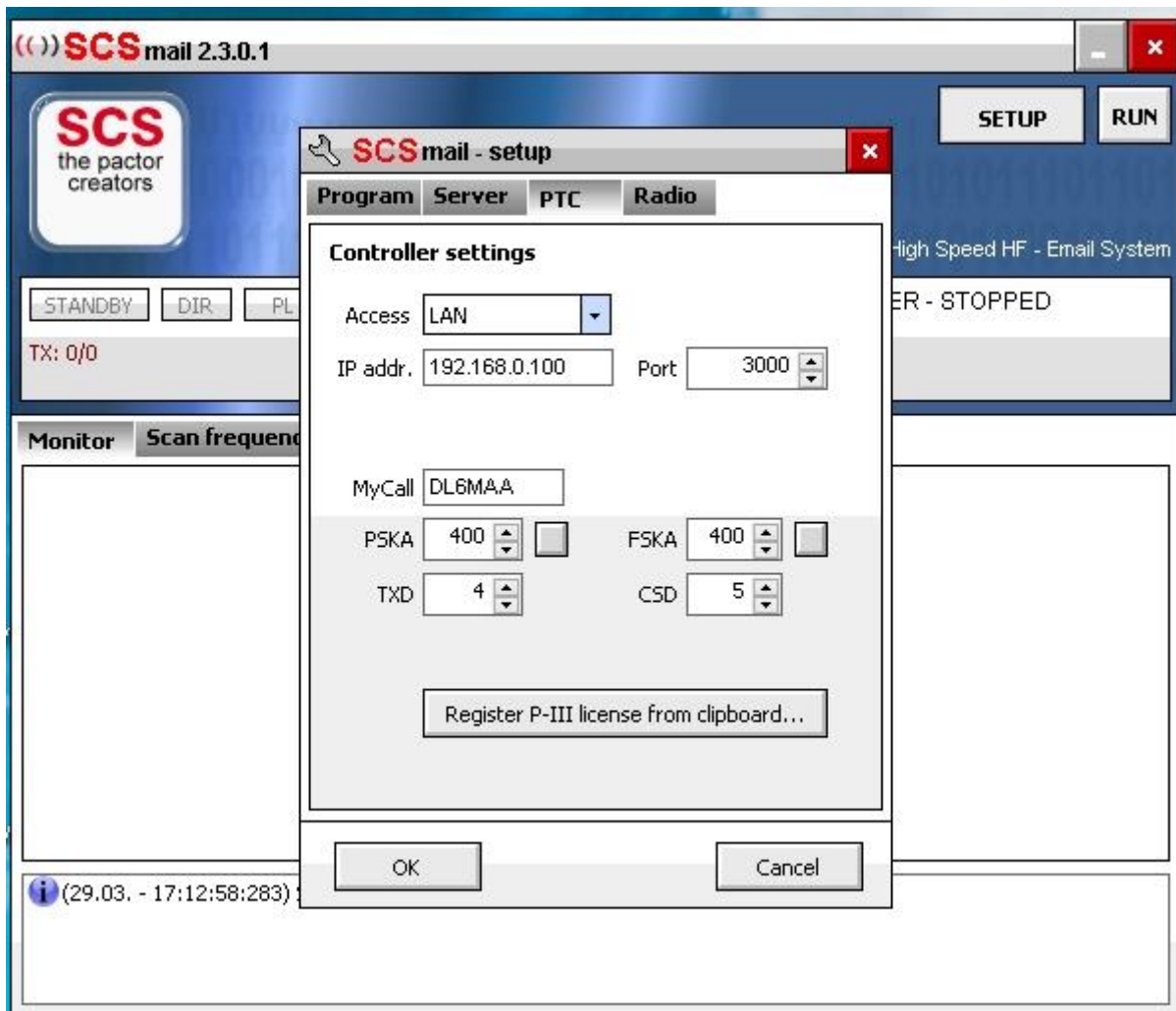
SCSmail Operation

SCSmail is available as a ZIP archive on the SCS website:

<https://www.p4dragon.com/download/SCSmail%202.3.0.1.zip>

No actual "installation" is needed. Simply extract the ZIP archive to your desired location and, if necessary, create a shortcut for SCSmail.exe on your desktop. Launch SCSmail by double-clicking on SCSmail.exe.

Operating SCSmail with the DR-9400 is identical to operating it with older DR-7400 modems, but also allows direct connection via an IP address (Telnet, ser2net) as an interface.



After setting the IP address, port 3000, audio levels, and TXD and CSD values to OK by clicking "OK," a session can be started with "RUN." SCSmail will then briefly configure the modem, after which the STOP button in the top right corner turns green. Details on operating SCSmail can be found in the SCSmail manual included in the ZIP archive.

Firmware Update (Applying a User Firmware)

A firmware update is performed using the **P4config.exe Tool**, similar to DR-7X00 modems (see above, "Simple Terminal Operation"). The outdated SCSupdate tool is currently unsuitable due to issues with larger update files.

For an update, the corresponding update file must always be available locally on your computer. Automatic download by P4config.exe is no longer supported for DR-9400. Update files are offered either directly on the SCS website or under special URLs (especially for beta testers).

The update files for the DR-9400 continue to use the file extension ".dr7" for compatibility reasons.

First, select the desired communication port for the modem in P4config.exe. Updates can be performed over all possible ports (LAN, WLAN, USB, Bluetooth).

After selecting the correct "PORT," "con modem" turns green.

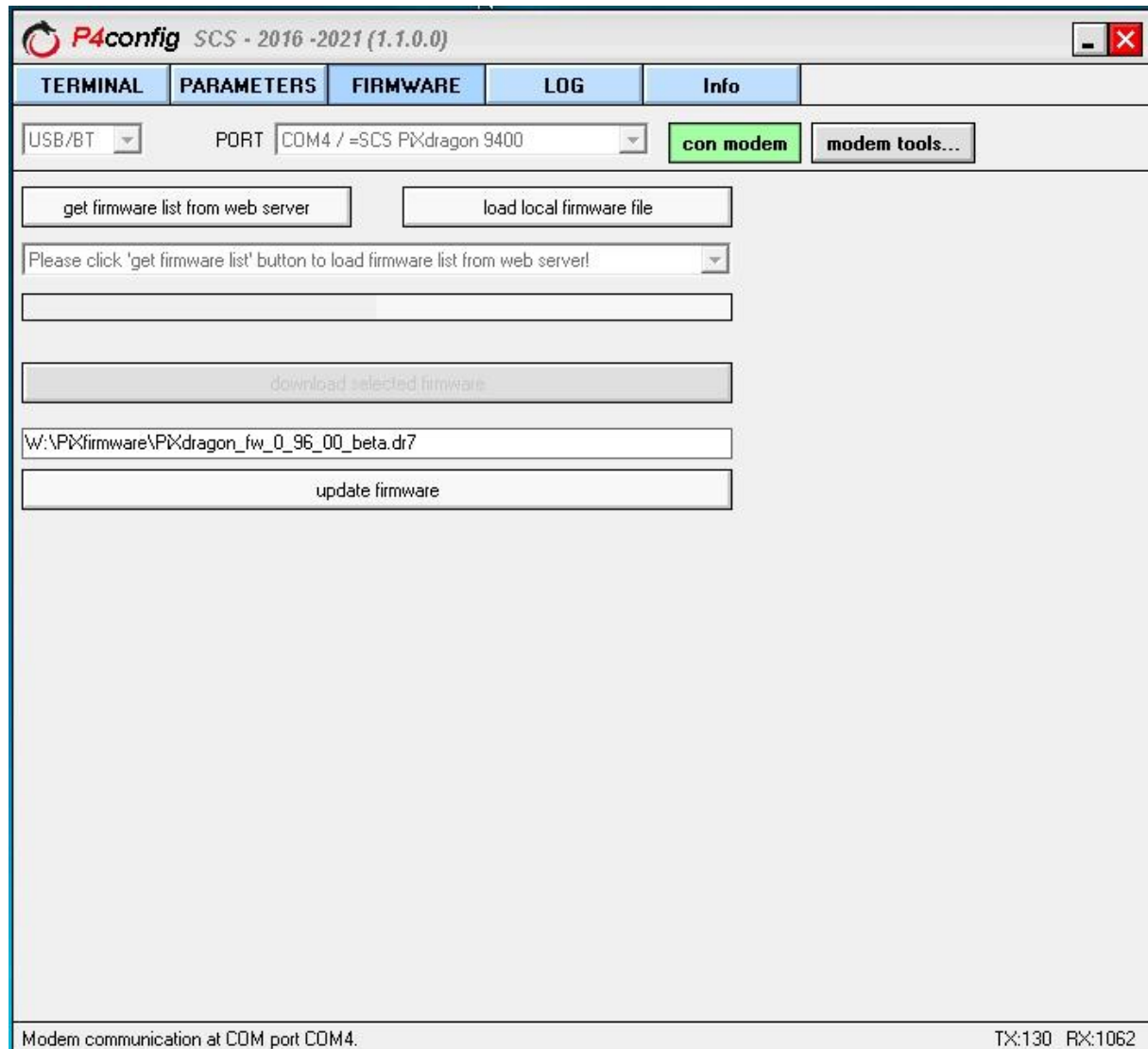
Now, click on the "FIRMWARE" tab.

The screenshot shows the P4config application window with the 'FIRMWARE' tab active. The 'PORT' is set to 'COM4 / =SCS PXdragon 9400'. The 'con modem' button is highlighted in green. The interface includes buttons for 'get firmware list from web server' and 'load local firmware file'. A message box prompts the user to click 'get firmware list' to load the firmware list from the web server. There is a 'download selected firmware' button and an 'update firmware' button. The status bar at the bottom indicates 'Modem communication at COM port COM4.' and 'TX:65 RX:531'.

Click on "load local firmware file" and select the desired update file from a local source. The DR-9400 updates always have filenames in the format:

PXdragon_fw_X_YY_ZZ_beta.dr7

Here, X is the main version number, YY is the two-digit minor version number, ZZ is the two-digit secondary minor version number, and "_beta" optionally indicates beta versions. The file extension is always ".dr7".



Then click on "update firmware."

The firmware update process begins. It should not be interrupted. However, if the update is interrupted, it does not affect the modem's functionality. The update only becomes effective and permanently stored after it has been fully received by the modem and the checksum verified.

The firmware update takes a few minutes to complete. Afterward, the modem automatically performs a "power cycle," meaning it reboots and replaces the old user firmware with new

user firmware. The so-called factory firmware (the version of the firmware the modem was delivered with) remains unaffected.

P4config.exe stays at an update status of 100% after successfully uploading the firmware and can be manually closed after the modem's reboot.

If a valid user firmware is found when starting the modem, the modem will use the user firmware instead of the factory firmware.

Resetting the Modem to Factory Firmware

If a user firmware ever causes problems that prevent further updates, it can be ignored by using the RESET button when starting the modem. This action will boot the factory firmware with its default settings.

To do this, press and hold the RESET button when powering on (before flipping the switch upwards) for about 10 seconds.

This also resets the WLAN parameter to 0, so if you want to perform an update over WLAN, it must be reset to 1.

After starting with factory firmware, a new user firmware can be uploaded into the modem using P4config.exe.

Feature Licenses

The DR-9400 modem currently supports feature licenses for the following features:

- **WLAN**
- **Bluetooth**
- **AES**

If you wish to utilize these features/abilities, you need a corresponding feature license (a license string tied to the serial number of the modem) from the dealer.

All three features are pre-licensed on the beta test modems.

More information about feature licenses can be found here:

https://www.p4dragon.com/download/SCS_Feature_Licenses_How_To_1.0.pdf

The information applies in principle to the DR-9400 as well, but note that ALE is not currently offered for this model.

Position Data

Position data (e.g. GPS) can be obtained either via a USB “GPS mouse” or via the serial NMEA input on the rear panel of the device.

Using GPS mouse

Two categories of USB position devices are supported:

- **USB UART Bridge devices** that connect as generic serial USB devices (ttyUSB on Linux).
- Devices that connect as **Abstract Control Model (ACM) devices** (ttyACM on Linux), like typical u-blox based GPS devices.

In both cases the modem performs automatic detection and full autobaud support.

We recommend the **BU-353N5 USB-GNSS receiver**. It is a USB UART Bridge type of USB position devices.

To verify if the GPS signal is correctly read by the modem, you can use the POS command:

```
cmd: pos

GPS POSITION REPORT
-----
- Latitude: 49° 13.3864' North
- Longitude: 010° 18.1766' East
- Velocity: 0.08 Knots
- Course: 126°
- Recorded at: 29/03/25 17:32:01 UTC/GMT
```

Using serial NMEA input

The NMEA/GPS port on the back of the device functions similarly to the DR-7X00 modems, with an added feature that allows polarity switching. This is achieved using the new command:

```
sys GPSPolarity 0/1
```

By default, it is set to 0, which means a non-inverted TTL signal at the middle pin (with "ground" on the far right pin) is decoded correctly. V.28 signals ("RS-232") can also be processed. The NMEA input is isolated from any potential.

To check and change the polarity:

```
cmd: sys GPSP

GPS/NMEA Port Polarity (0 -> normal, 1 -> inverted): 0
```

The GPSPolarity parameter can be made permanent with the SAP command.

To verify if the GPS signal is correctly read by the modem, you can also use the POS command, see above.

Secondary Operating Modes (Packet Radio, APRS)

The DR-9400 modem supports secondary operating modes alongside PACTOR, including Packet Radio (PR), Robust Packet Radio (RPR), as well as APRS. These modes are primarily of interest to amateur radio enthusiasts.

For detailed information on the features, you can currently refer to the following documents:

https://www.p4dragon.com/download/Update_Info_DR7X00_Version_2_00_English.pdf

https://www.p4dragon.com/download/Update_Info_DR7X00_Version_2_10_English.pdf

https://www.p4dragon.com/download/Update_Info_DR7X00_Version_2_20_English.pdf

The modem uses an SD card as non-volatile storage. The modem uses an SD card as non-volatile storage.

On the Durability of the microSD Card

The modem utilizes a microSD card as non-volatile memory. The Linux on that microSD card, used as *platform* (OS) for the modem, is not a standard Linux. It is a *Buildroot*-based Linux developed specifically for the modem, precisely tailored to it. The entire operating system resides in a **read-only** partition.

Only write operations are limited in number on flash memory; read operations are not a problem.

Only user data (modem parameters, Wi-Fi/Bluetooth settings, log data) are written to the microSD card - at very low frequency and in very small volume - and only in a separate partition, the user file system.

Nonetheless, industrial-grade microSD cards are used as non-volatile memory for the modem. Therefore, it is practically impossible that any damage would appear on the SD card as a result of long-term operation. When the modem is running in standby mode, normally nothing at all is written to the microSD card.

Modem Log

The command **sys log** in the cmd menu can be used to read the modem log. The modem log is often helpful for troubleshooting and should be sent to the manufacturer or firmware creator (SCS) if requested.

It can, for example, be redirected to a file using Coolterm. Also automatic, protocol-based downloading of the log using the corresponding P4config function is possible:

modem tools... -> Download modem logfile... -> Save File after download is completed.

The log can currently grow up to 4 MB in size.

cmd: **sys log**

LOG:

READ n - print the last n bytes of the system log.
The default is 10000 bytes if n is omitted.
READ BOOT - print the log since the last boot event.
READ ALL - print the complete system log.
SIZE - print the log size.
CLEAR - clear system log.

An example of what it might look like is as follows:

cmd: **sys log read all**

```
Jan 1 01:00:13 localhost user.info PACTOR[504]: STBY_INIT started
Jan 1 01:00:13 localhost user.info PACTOR[504]: clr_brdA: brdout = 0, brdin = 0
Jan 1 01:00:13 localhost user.info PACTOR[504]: clr_brdB: brdout = 0, brdin = 0
Jan 1 01:00:13 localhost user.info PACTOR[504]: STBY_INIT ready
Jan 1 01:00:13 localhost user.info PACTOR[504]: PR TNC-INIT OK! 1
Jan 1 01:00:16 localhost user.notice StartNetwork: eth0: link
Jan 1 01:00:20 PXdragon-lan user.notice StartNetwork: chrony: starting via xS46chrony
Aug 23 16:11:10 PXdragon-lan user.info PACTOR[504]: EXT NMEA: RMC string found, device type 1 locked
Aug 23 16:11:40 PXdragon-lan user.info PACTOR[504]: clr_brdA: brdout = 0, brdin = 0
Aug 23 16:11:40 PXdragon-lan user.info PACTOR[504]: clr_brdB: brdout = 0, brdin = 0
Aug 23 16:11:41 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx779 st12779
Aug 23 16:11:42 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx778 st24778
Aug 23 16:11:43 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx777 st36777
Aug 23 16:11:45 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx776 st48776
Aug 23 16:11:46 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx775 st60775
Aug 23 16:11:47 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx774 st72774
Aug 23 16:11:48 PXdragon-lan user.info PACTOR[504]: ISS: PT1 SL2 Cyc0 dF 0.0 rxcs0 st39 prx0 ptx1000 ctx773 st84773
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: Disconnect
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: do_disconnectx
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: iss_task: low packet transmit time = 3042
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: STBY_INIT started
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: clr_brdA: brdout = 0, brdin = 8
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: clr_brdB: brdout = 0, brdin = 0
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: STBY_INIT ready
Aug 23 16:11:49 PXdragon-lan user.info PACTOR[504]: STBYA
```

Contact

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Technical Specifications

Supported Operating Modes

- PACTOR-1 / -2 / -3 / -4
- PACTOR Monitor
- Packet Radio (9k6 G3RUH, 1k2 AFSK)
- Robust Packet Radio (RPR)
- APRS (Automatic Beaconsing)
- Weather-FAX (Receive only)
- RTTY (Receive only)
- SITOR-B FEC (NAVTEX, Receive only)

Processor

ARM v8 Quad-Core @ 1.8 GHz

Permanent Storage

Industrial grade MicroSD card

Operating System

PXdragon Buildroot Linux (real-time processing)

User Interfaces

- USB-C
- LAN
- WIFI*
- Bluetooth*

*note: optional USB dongle + Licence required

GPS Interface

- Balanced, isolated GPS input (supports both TTL levels [3.3V / 5V] and V.28/RS-232)
- NMEA sentence decoder
- Software-switchable signal polarity
- Alternatively, USB GPS receivers ("GPS mouse") are supported, bypassing the hardware input. (The hardware input is mainly for compatibility with legacy DR-7X00 modems.)

Transceiver Audio Interface

- Input impedance: 44 k Ω
- Input level: 30 mV to 6.6 V p-p
- Output impedance: 1 k Ω
- Output level: 30 mV to 5.0 V p-p

Status Indicators

10 dual-color LEDs (green/red) indicating key operational states

Controls

- Toggle switch (Power On/Off)
- RESET button

Time Base

Temperature-compensated oscillator (TCXO), 1 ppm accuracy

Power Supply

- Voltage: 12V to 30V DC
- Current consumption: 270 mA @ 13.8 V (typical), up to 1 A (max)

Dimensions

168 × 45 × 100 mm

Weight

470 grams

Specifications are subject to change without prior notice.

OPTIONAL ACCESSORIES

WiMo and selected dealers offer the following useful and high-quality accessories for the PXdragon DR-9400.

Transceiver Adapter Cables

The transceiver cables are 1.60 m long and are compatible with the transceivers listed in the table below. The **TRX** cable enables **remote control of the transceiver** directly via the modem (and is used, for example, by Winlink Express). The audio cables provide the correct wiring for RX and TX audio, as well as PTT and optionally power supply.

Part no.	Description	Compatible Radios, e.g.
40150.IC8	Audio Cable ICOM 8 pin	IC-7610/7760 etc.
40150.IC13	Audio Cable ICOM 13 pin	IC-7300/IC718/IC-7100
40150.Y6	Audio Cable YAESU 6 pin Mini DIN	FT817/857/897/891/DX10/710/991/FT-101/(RTTY/DATA), TS-480
40150.YCAT	TRX-Control Cable YAESU 8 pin Mini DIN	YAESU FT817/857/897
40150.CIV	TRX-Control Cable ICOM CI-V	ICOM Radios with CI-V port (3.5mm mono)
40150.YSD9	TRX-Control Yaesu sub-D 9-pin	FT-DX101/DX10/991
40150.FLEX	Audio Flexradio HD-15	6x00/8x00

Adapter Cables DIN-M12 No 40150.xx

With these adapters (M12–DIN), the old cables for DR-7X00 modems can continue to be used easily. It is plug and play. An old SCS modem can be replaced with a new PXdragon modem without having to change the cabling to the transceivers. This compatibility extends all the way back to the legendary PTC-IIpro models.



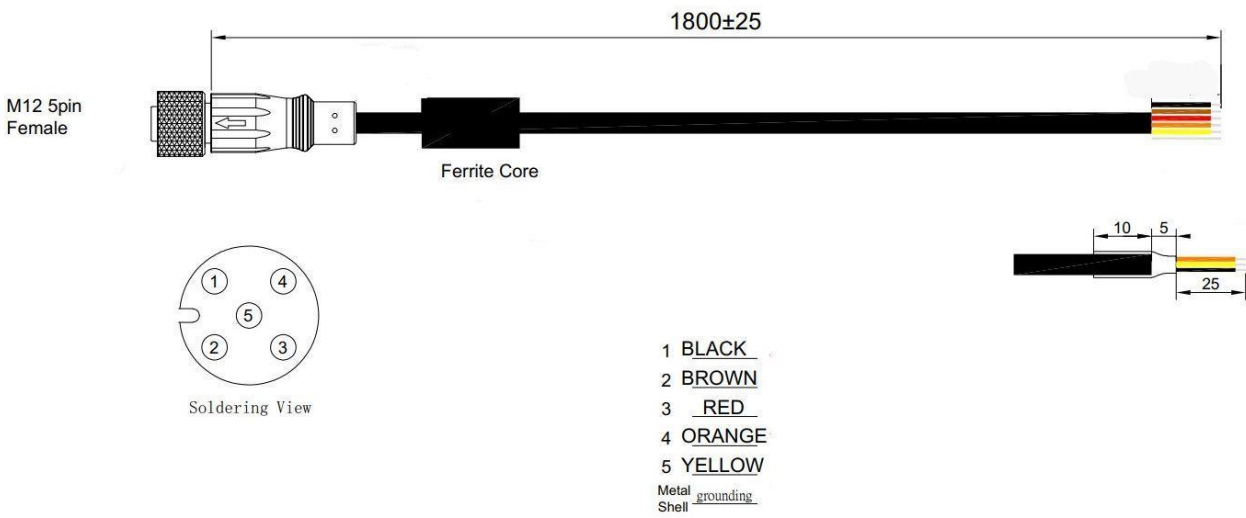
SKU:	Description
40150.12	DIN-Adapter cable 12pol for PXdragon
40150.05	DIN-Adapter cable 5-pol for PXdragon

Open End M12 Pigtails, No 40154.xx:

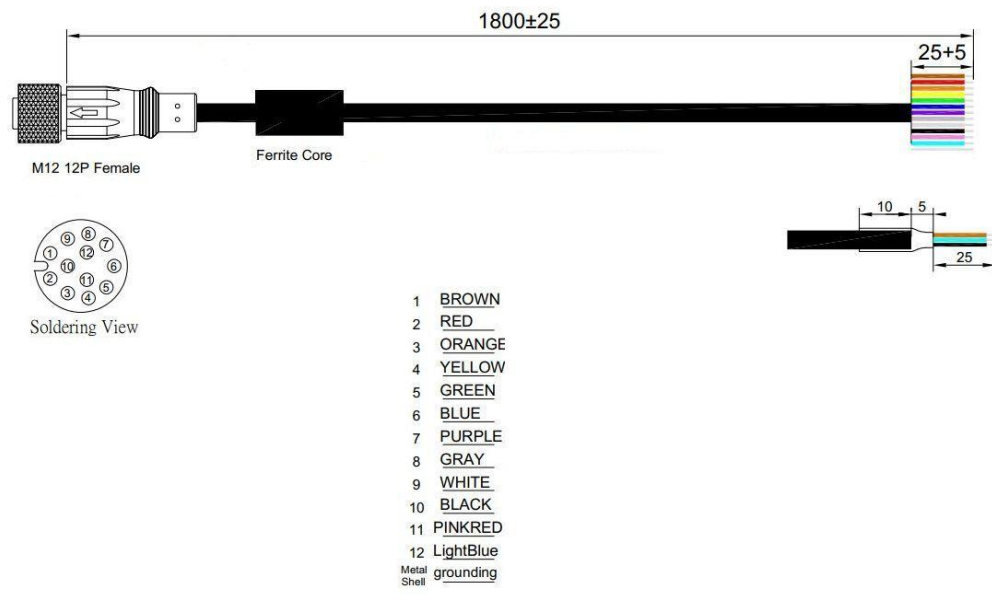
With these cables, you can create your own connection cables for any type of radio. If there are no pre-assembled cables for your radio listed in the table above, you will need to attach the connector on the radio side yourself.

SKU:	Description
40154.05	M12-5 Open end cable
40154.12	M12-12 Open end cable

Color Codes:



40154.05



40154.12