LocalNet 20/100™
Dual Port Packet Communication Unit

The LocalNet 20/100™ Packet Communication Unit (PCU) is a microprocessor-based, packet-mode network interface unit that is associated with each user device (terminal, host port, etc.) to provide distributed intelligence, and to provide connection between the user device and a CATV-based local area network. LocalNet equipment can support over 20,000 connections to the network.

Features
- Provides an error rate of less than 1 in $10^9$ bits for virtually error-free data transmission.
- Operates with standard CATV cable (or other 75 ohm coaxial cable), allowing installation by local contractors with no special electronics experience.
- Compatible with midsplit, subsplit and dual cable installations for easy implementation on existing networks.
- Uses branching tree cable topology, so that failure of a single node or cable branch has no effect on the rest of the network.
- Is frequency agile; allows any of a pre-selected set of 20 frequency channels to be digitally tuned.
- Provides virtual connection support and value added services.

Description
The 20/100 PCU is an extraordinarily sophisticated RF transceiver. It performs digital/analog (device to cable) and analog/digital (cable to device) conversion, plus all the following tasks:
- Establishing, maintaining and disconnecting virtual connections between nodes.
- Formatting and addressing user data packets to their destinations, using internal LocalNet data communications protocols.
- Controlling the allocation of the channel bandwidth using CSMA/CD (Carrier Sense Multiple Access with Collision Detection) mechanisms.
- Controlling the flow of data over the channel and supported virtual connections to prevent congestion and data loss—both local (at the terminal or host port) and global (aggregate traffic on the backbone channel).
- Detecting errors through use of CRC (Cyclic Redundancy Checks), and correcting errors through retransmission of lost or damaged packets.
- Supporting optional value-added services, including protocol and code conversion, directory services, and end-to-end encryption.
- Exporting these functions to the user equipment through use of interface protocols.

The 20/100 PCU contains a frequency synthesized, full-duplex, frequency-shift keyed, RF modem with a fixed offset spacing between the transmit and receive frequencies. Each PCU in the network is frequency agile, and can operate on any of 20 pre-selected frequencies. Many PCUs can share the same frequency, using the CSMA/CD mechanism. Each 20/100 PCU can support two serial user ports, which may be either synchronous or asynchronous.

### Analog Specifications

**Transmitter**

- Transmit frequency range: 70 to 106 MHz (midsplit) 10 to 28 MHz (subsplit)
- Transmitter power output: +30 to +48 dBmV, factory adjustable
- Output linearity: ± 2 dB
- Modulation technique: Frequency shift keying (FSK)
- Frequency deviation: ± 35 KHz, with a tolerance of ± 2 KHz
- Frequency stability: ± 0.005%
- Number of channels supported: 120 midsplit, 60 subsplit
- Channel spacing: 300 KHz
- Frequency agility: Any one of 20 subchannels within 6 MHz wide group is software-selected. Group assignment is an ordering option.

**Receiver**

- Carrier on/off ratio: Greater than 50 dB
- Carrier harmonic content: Greater than 50 dB below carrier level
- Output impedance: 75 ohms

### Digital Interface Specifications

**Option P01:** EIA RS-232C asynchronous with full modem control Protocol
- Data rate: 75 bps to 19.2 Kbps
- Flow control: EIA (RTS/CTS), XON/XOFF, or none
- Character length: 7 (with parity), 8 (without parity)
- Number of stop characters: 1, 1.5, or 2
- Parity: Odd, even, or none
- Number of DTE interfaces: Two
- Throughput: 16 Kbps

### User Interface Specifications

**Type:** A set of parameters and functions similar to those of CCITT X.3 is provided for the interface between the DTE and the 20/100 PCU. Interface to the LocalNet is provided via a CCITT X.28-like interface specifically designed to support local area networks.

**Protocol:** Virtual connection (VC) higher-level protocol, providing end-to-end data integrity.

**Capacity:** Up to four concurrent virtual connections supported per 20/100 PCU.

**User commands**

- **AU[tobaud]** Enables and disables the autobaud pin on the RS-232 connector.
- **BA[ud]** Specifies the DTE to 20/100 PCU port baud rate.
- **CA[ll]** Requests establishment of a virtual connection to another PCU.
- **CO[mmand]** Specifies character sequence (or break key) to be used to enter command mode.
- **DCD** Determines how the Data Carrier Detect signal is controlled.

### Nominal input power level:

-2 dBmV ± 6
-8 dBmV to +4 dBmV
Greater than 2.7 microvolts for 20 dB of quieting on all channels

**Receiver sensitivity:**

Receiver stability:

Input impedance:

### Analog Specifications

- **Transmitter**
  - Transmit frequency range:
    - 70 to 106 MHz (midsplit)
    - 10 to 28 MHz (subsplit)
  - Transmitter power output:
    - +30 to +48 dBmV, factory adjustable
  - Output linearity:
    - ± 2 dB
  - Modulation technique:
    - Frequency shift keying (FSK)
  - Frequency deviation:
    - ± 35 KHz, with a tolerance of ± 2 KHz
  - Frequency stability:
    - ± 0.005%
  - Number of channels supported:
    - 120 midsplit, 60 subsplit
  - Channel spacing:
    - 300 KHz
  - Frequency agility:
    - Any one of 20 subchannels within 6 MHz wide group is software-selected. Group assignment is an ordering option.

- **Receiver**
  - Carrier on/off ratio:
    - Greater than 50 dB
  - Carrier harmonic content:
    - Greater than 50 dB below carrier level
  - Output impedance:
    - 75 ohms

<table>
<thead>
<tr>
<th>Option</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td>EIA RS-232C asynchronous with full modem control Protocol</td>
</tr>
<tr>
<td>P02</td>
<td>3270 Bisynchronous Protocol</td>
</tr>
<tr>
<td></td>
<td>Data rate: 75 bps to 19.2 Kbps</td>
</tr>
<tr>
<td></td>
<td>Flow control: EIA (RTS/CTS), XON/XOFF, or none</td>
</tr>
<tr>
<td></td>
<td>Character length: 7 (with parity), 8 (without parity)</td>
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<td>Number of DTE interfaces: Two</td>
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<tr>
<td></td>
<td>Throughput: 16 Kbps</td>
</tr>
</tbody>
</table>

- **Nominal input power level:**
  - -2 dBmV ± 6
  - -8 dBmV to +4 dBmV
  - Greater than 2.7 microvolts for 20 dB of quieting on all channels

- **Receiver sensitivity:**

- **Receiver stability:**

- **Input impedance:** 75 ohms

**Digital Interface Specifications**

- **Option P01:** EIA RS-232C asynchronous with full modem control Protocol
- **Option P02:** 3270 Bisynchronous Protocol
- **Data rate:** 75 bps to 19.2 Kbps
- **Flow control:** EIA (RTS/CTS), XON/XOFF, or none
- **Character length:** 7 (with parity), 8 (without parity)
- **Number of stop characters:** 1, 1.5, or 2
- **Parity:** Odd, even, or none
- **Number of DTE interfaces:** Two
- **Throughput:** 16 Kbps

**User Interface Specifications**

- **Type:** A set of parameters and functions similar to those of CCITT X.3 is provided for the interface between the DTE and the 20/100 PCU. Interface to the LocalNet is provided via a CCITT X.28-like interface specifically designed to support local area networks.
- **Protocol:** Virtual connection (VC) higher-level protocol, providing end-to-end data integrity.
- **Capacity:** Up to four concurrent virtual connections supported per 20/100 PCU.
- **User commands**
  - **AU[tobaud]** Enables and disables the autobaud pin on the RS-232 connector.
  - **BA[ud]** Specifies the DTE to 20/100 PCU port baud rate.
  - **CA[ll]** Requests establishment of a virtual connection to another PCU.
  - **CO[mmand]** Specifies character sequence (or break key) to be used to enter command mode.
  - **DCD** Determines how the Data Carrier Detect signal is controlled.
DI[sable] Specifies commands which are to be made unavailable.

DTR Determines how the Data Terminal Ready signal is controlled.

DO[ne] Terminates a previously established virtual connection.

EC[ho] Causes 20/100 PCU port to echo data characters back to the DTE when in the data transfer mode.

EN[able] Re-enables previously disabled commands.

EOM Specifies conditions for sending end-of-message signal to remote PCU.

EX[pand] Specifies character sequence to be generated in response to a newline character from the DTE.

F[low] Specifies method of DTE to 20/100 PCU port flow control.

G[roup] Specifies the modem channel group for the PCU.

H[elp] Displays list of 20/100 PCU commands.

ID[le] Specifies the delay after the last byte is received by the 20/100 PCU port before a packet is sent.

IN[terrupt] Causes the 20/100 PCU to send an interrupt (break) signal to a remote PCU.

LI[sten] Specifies that the port is to listen for incoming call request packets.

LO[cation] Specifies channel and link address for the 20/100 PCU.

M[axsession] Specifies the maximum number of sessions allowed for this user port.

N[ewline] Specifies the value of the newline character.

PA[arity] Specifies the parity to be used from the 20/100 PCU port to the DTE. The parity of data received by the DTE is ignored.

PC[all]: Determines if permanent sessions are to be established, and under what conditions.

PR[ivilege] Enables or disables 20/100 PCU privileged mode. Privilege mode allows a 20/100 PCU to override both local and remote command disablement in order to execute any command on any PCU.

PU[nit]: Identifies the unit and, optionally the port to which a permanent session is to be made.

Q[uiet] Suppresses character echo and command responses from the 20/100 PCU port to the DTE.

R[emote] Specifies commands that are to be executed at a remote PCU.

STA[tus] Displays the status of the 20/100 PCU and the PCU port in use. This display contains the following information:

Software version ID number
Local address specification
Baud rate to DTE
Command mode entry character sequence
Echo mode
EOM conditions
Newline expansion characters
Flow control mode
Idle timeout
Listen mode status
Maxsession count
Newline character
Parity selected
Privileged mode status
Quiet mode status
Number of stops
XON/XOFF characters
Connection status
PCALL
PUNIT
AUTOBAUD
DCD
DTR

STO[ps] Specifies the number of stop bits on data bytes to be sent to the DTE.

SU[spend] Suspends data transfer on the specified session.

SW[itch] Deactivates the current session and switches the DTE to another session.

U[nit] Specifies a unique identification number for the 20/100 PCU.

XOFF Specifies the character to be used to represent XOFF.

XON Specifies the character to be used as XON with XON/XOFF flow control.

(Note that most of these commands are applicable to either of the DTE interface ports. The status returned will then correspond to that particular port.)
Environmental Specifications
Operating temperature: 0 to +40°C
Relative humidity: To 95% (non-condensing)

Physical and Mechanical Specifications

Rear panel connectors
Digital: Two DB-25S or equivalent per DTE port
RF: Female type F coaxial fitting
Power: Recessed male RFI-filtered fused AC connector
Rear panel controls: System reset push-button

Front panel indicators
Power on: Red/green LED indicates power on condition and packet transmission
Status: Red/green LED indicates self-test status, connection established, and packet reception

Size: 3.625" high by 8.25" wide by 12.5" long
Weight: 6 lbs (approximate)

Power Requirements:
Voltage/Frequency: 115 VAC ±10%, 60 Hz ±5%
220 VAC ±10%, 50 Hz ±5%
Power Consumption: 35W
MTBF: 2.9 years

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LocalNet 20/100</td>
<td>P01</td>
<td>Asynchronous User Device Protocol</td>
</tr>
<tr>
<td></td>
<td>P02</td>
<td>3720 Bisynchronous User Device Protocol</td>
</tr>
<tr>
<td></td>
<td>U00</td>
<td>RS-232C User Device Physical Interface</td>
</tr>
<tr>
<td></td>
<td>W00</td>
<td>115 VAC 50/60 Hz AC power</td>
</tr>
<tr>
<td></td>
<td>W01</td>
<td>220 VAC 50/60 Hz AC power</td>
</tr>
</tbody>
</table>

IMPORTANT: Each LocalNet 20/100 PCU must be ordered with one modem channel group option from the following list.

Single Cable Midsplit Channel Groups

<table>
<thead>
<tr>
<th>Option</th>
<th>Desc.</th>
<th>Rx Freq.</th>
<th>Tx Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>Group A</td>
<td>226.25-232.25</td>
<td>70-76 MHz</td>
</tr>
<tr>
<td>B01</td>
<td>Group B</td>
<td>232.25-238.25</td>
<td>76-82 MHz</td>
</tr>
<tr>
<td>C01</td>
<td>Group C</td>
<td>238.25-244.25</td>
<td>82-88 MHz</td>
</tr>
<tr>
<td>D01</td>
<td>Group D</td>
<td>244.25-250.25</td>
<td>88-94 MHz</td>
</tr>
<tr>
<td>E01</td>
<td>Group E</td>
<td>250.25-256.25</td>
<td>94-100 MHz</td>
</tr>
<tr>
<td>F01</td>
<td>Group F</td>
<td>256.25-262.25</td>
<td>100-106 MHz</td>
</tr>
</tbody>
</table>

Dual Cable Midsplit Channel Groups

<table>
<thead>
<tr>
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<th>Desc.</th>
<th>Rx Freq.</th>
<th>Tx Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02</td>
<td>Group A</td>
<td>226.25-232.25</td>
<td>70-76 MHz</td>
</tr>
<tr>
<td>B02</td>
<td>Group B</td>
<td>232.25-238.25</td>
<td>76-82 MHz</td>
</tr>
<tr>
<td>C02</td>
<td>Group C</td>
<td>238.25-244.25</td>
<td>82-88 MHz</td>
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<td>Group E</td>
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<td>F02</td>
<td>Group F</td>
<td>256.25-262.25</td>
<td>100-106 MHz</td>
</tr>
</tbody>
</table>

Single Cable Subsplit Channel Groups

<table>
<thead>
<tr>
<th>Option</th>
<th>Desc.</th>
<th>Rx Freq.</th>
<th>Tx Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L11</td>
<td>Group L</td>
<td>226.25-232.25</td>
<td>10-16 MHz</td>
</tr>
<tr>
<td>M11</td>
<td>Group M</td>
<td>232.25-238.25</td>
<td>16-22 MHz</td>
</tr>
<tr>
<td>N11</td>
<td>Group N</td>
<td>238.25-244.25</td>
<td>22-28 MHz</td>
</tr>
</tbody>
</table>

Dual Cable Subsplit Channel Groups

<table>
<thead>
<tr>
<th>Option</th>
<th>Desc.</th>
<th>Rx Freq.</th>
<th>Tx Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L12</td>
<td>Group L</td>
<td>226.25-232.25</td>
<td>10-16 MHz</td>
</tr>
<tr>
<td>M12</td>
<td>Group M</td>
<td>232.25-238.25</td>
<td>16-22 MHz</td>
</tr>
<tr>
<td>N12</td>
<td>Group N</td>
<td>238.25-244.25</td>
<td>22-28 MHz</td>
</tr>
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