

Introduction

The purpose of this application note is to help you setup Conexant Embedded modem products (SmartACF, SC56D, SmartV.xx, SM56D, SCXV.22bis and SCXV.xx) to the different modes used in Point of Sale (POS) applications. This Application Note provides the AT commands initialization string for all the following modes:

- Bell103FastConnect and V.21FastConnect (300bps) Asynchronous
- V.22 and Bell212A (1200bps) SDLC
- V.22 and Bell212A (1200bps) Asynchronous
- V.22FastConnect and Bell212AFastConnect (1200bps) SDLC
- V.22FastConnect and Bell212AFastConnect (1200bps) Asynchronous
- V.22bis and Bell 2400bps (2400bps) SDLC
- V.22bis and Bell2400bps (2400bps) Asynchronous
- V.29FastPOS (9600bps) SDLC
- ITU and Bell POS answer modes

Note: Not all Conexant Embedded products/firmware releases support the POS features described in this document. Please contact to your local FAE for more information on what code version or product you should be using in order to support the features described in this document.

1. V.21FastConnect and Bell103FastConnect (300bps) Asynchronous Mode

Note: Some POS servers in the field use a non-standard V.21 or Bell103 handshake sequence that allows shorter connection time. Enabling standard ITU V.21 or standard Bell103 (ATS17=0) will also work fine against these servers. However, setting S17 register bit 6 (ATS17=64) in addition to AT+MS=V21 or AT+MS=B103 activates “V.21FastConnect” or “Bell103FastConnect” handshake sequence. Please refer to S17 register definition.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V.21FC ASYN: AT&F\N0;+MS=V21;S17=64
B103FC ASYN: AT&F\N0;+MS=B103;S17=64
- For other Conexant Embedded Products (supporting V.29FastPOS)

V21FC ASYN: AT&F;%C0\N0;+A8E=,,,0;+MS=V21;S17=64
B103FC ASYN: AT&F;%C0\N0;+A8E=,,,0;+MS=B103;S17=64

2. ITU V.22 and Bell212A (1200bps) SDLC Mode

Note: Some POS servers in the field require going into data mode earlier than standard V.22 or Bell212A handshake. Setting bit1 of S-register 17 in addition to AT+MS=V22 or AT+MS=B212 activates what we internally call “Early Data Mode” in V.22 and Bell212A in order to connect to these servers. Please refer to S17 register definition.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22 SDLC AT&F\N0;+MS=V22;+ES=6,,8;+ESA=0,0,,,1,0;S17=7
B212 SDLC AT&F\N0;+MS=B212;+ES=6,,8;+ESA=0,0,,,1,0;S17=7
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22 SDLC AT&F;%C0\N0;+A8E=,,,0;+MS=V22;+ES=6,,8;+ESA=0,0,,,1,0;S17=7
B212 SDLC AT&F;%C0\N0;+A8E=,,,0;+MS=B212;+ES=6,,8;+ESA=0,0,,,1,0;S17=7

3. ITU V.22 and Bell212A (1200bps) Asynchronous Mode

Note: Some POS servers in the field require going into data mode earlier than standard V.22 or Bell212A handshake. Setting bit1 of S-register 17 in addition to AT+MS=V22 or AT+MS=B212 activates what we internally call “Early Data Mode” in V.22 and Bell212A in order to connect to these servers. Please refer to S17 register definition.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22 ASYN AT&F\N0;+MS=V22;S17=6
B212 ASYN AT&F\N0;+MS=B212;S17=6
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22 ASYN AT&F;%C0\N0;+A8E=,,,0;+MS=V22;S17=6
B212 ASYN AT&F;%C0\N0;+A8E=,,,0;+MS=B212;S17=6

4. V.22FastConnect and Bell212AFastConnect (1200bps) SDLC Mode

Notes: The only difference that exists between V.22FastConnect and Bell212AFastConnect is the type of answer tone sent by the answering modem. If ITU answer tone is sent (2100 Hz), we

call this 1200bps fast connect handshake “V.22FastConnect”. But if Bell answer tone is sent (2225 Hz), we call it “Bell212AFastConnect”. However, we use the same AT commands to enable both modes.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22FC SDLC
AT&F\N0;\$F2;+MS=V22;+ES=6,,8;+ESA=0,0,,,1,0;S17=13
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22FC SDLC
AT&F;%C0\N0;+A8E=,,,0;\$F2;+MS=V22;+ES=6,,8;+ESA=0,0,,,1,0;S17=13

5. V.22FastConnect and Bell212AFastConnect (1200bps) Asynchronous Mode

Note: The only difference that exists between V.22FastConnect and Bell212AFastConnect is the type of answer tone sent by the answering modem. If ITU answer tone is sent (2100 Hz), we call this 1200bps fast connect handshake “V.22FastConnect”. But if Bell answer tone is sent (2225 Hz), we call it “Bell212AFastConnect”. However, we use the same AT commands to enable both modes.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22FC ASYN AT&F\N0;\$F2;+MS=V22;S17=0
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22FC ASYN AT&F;%C0\N0;+A8E=,,,0;\$F2;+MS=V22;S17=0

6. ITU V.22bis and Bell 2400bps (2400bps) SDLC Mode

Note: When, instead of sending ITU 2100 Hz answer tone, answering modems send Bell answer tone (2225 Hz), we internally refer to this handshake sequence as “Bell 2400bps compatible handshake sequence”. The only difference with ITU V.22bis handshake is that, in this mode, instead of waiting for the end of answer tone and then looking for unscrambled ones, the originating modem directly sends S1 signal after detecting 2225Hz answer tone. In originating modes, Conexant Embedded modems use the same initialization string to connect either in ITU V.22bis or Bell 2400bps compatible handshake.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22B SDLC AT&F\N0;+MS=V22B;+ES=6,,8;+ESA=0,0,,,1,0;S17=7
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22B SDLC AT&F;%C0\N0;+A8E=,,,0;+MS=V22B;+ES=6,,8;+ESA=0,0,,,1,0;S17=7

7. ITU V.22bis and Bell 2400bps (2400bps) Asynchronous Mode

Note: When, instead of sending ITU 2100 Hz answer tone, answering modems send Bell answer tone (2225 Hz), we internally refer to this handshake sequence as “Bell 2400bps compatible handshake sequence”. The only difference with ITU V.22bis handshake is that, in this mode, instead of waiting for the end of answer tone and then looking for unscrambled ones, the originating modem directly sends S1 signal after detecting 2225Hz answer tone. In originating modes, Conexant Embedded modems use the same initialization string to connect either in ITU V.22bis or Bell 2400bps compatible handshake.

AT Commands Initialization string:

- For SCXV.22bis (not supporting V.29FastPOS)
V22B ASYN AT&F\N0;+MS=V22B;S17=6
- For other Conexant Embedded Products (supporting V.29FastPOS)
V22B ASYN AT&F;%C0\N0;+A8E=,,,0;+MS=V22B;S17=6

8. V.29FastPOS (9600bps) SDLC Mode

Note: V.29FastPOS is a half-duplex modulation. Only one modem can transmit at a time. When one modem transmits data, the other one must be in receive mode. In order to switch from transmit to receive mode and vice-versa, the host DTE must be able to handle half-duplex turn-around controlling/monitoring DTE-DCE interface hardware signals (RTS/CTS/DCD). For more information about Half-Duplex turn-around procedure, please refer to the Half-Duplex Turn-Around Application Note.

AT Commands Initialization string:

- For SCXV.22bis
NOT SUPPORTED
- For other Conexant Embedded Products (supporting V.29FastPOS)

V29FP SDLC AT&F;%C0\N0;+A8E=,,,0;\$F4;+ES=6,,8;+ESA=0,0,,,1,0;S17=13

Note: Some of our customers have required a software flow control of RTS, CTS and DCD signals. In order to answer their needs, we enable IBC (In Band Commands) flow control adding the following AT command to the usual V.29FastPOS initialization string:
AT+IBC=1,1,1,,1

The IBC DTE-DCE values reporting of RTS, CTS and DCD status are:

RTS OFF: 19h 42h

RTS ON: 19h 43h

CTS OFF: 19h 62h

CTS ON: 19h 63h

DCD OFF: 19h 66h

DCD ON: 19h 67h

9. ITU and Bell POS Answer Modes

- For SCXV.22bis (not supporting V.29FastPOS)

ITU POS ANS AT&F\N0+ESA=0,0,,,1,0;S0=1;S17=4;\$F2

Bell POS ANS AT&F\N0+ESA=0,0,,,1,0;S0=1;S17=4;\$F2;+MS=B212

- For other Conexant Embedded Products (supporting V.29FastPOS)

ITU POS ANS AT&F;%C0\N0;+A8E=,,,0;\$F4;+ESA=0,0,,,1,0;S17=5;B0

Bell POS ANS AT&F;%C0\N0;+A8E=,,,0;\$F4;+ESA=0,0,,,1,0;S17=5;B1

Note: If needed, POS answer modes can be limited to 2400bps (V.29FastPOS answer mode disabled). To do so, simply replace \$F4 by \$F2:

ITU POS ANS AT&F;%C0\N0;+A8E=,,,0;\$F2;+ESA=0,0,,,1,0;S17=5;B0

Bell POS ANS AT&F;%C0\N0;+A8E=,,,0;\$F2;+ESA=0,0,,,1,0;S17=5;B1