# T10 02 – 203r2  SAS (Link & Port) Request-Confirmation List

R-REQUEST, C-CONFIRMATION,

| State | Type | Request/Conformation | Reason |
|---|---|---|---|

Black – Current Spec (SAS r00c)Wording; Blue- Change to Spec

## SAS Link Layer to Port Layer Communication

| State | Type | Request/Conformation | Reason |
|---|---|---|---|
| SL0; | R | Open Connection | Port layer request link layer to open a connection |
| SL1;Arb Sel | R | Stop Arb | Port layer request link layer to terminate arbitration |
| SL1;SL0 | C | Open Failed(Wrong destination) | IF OPEN_REJECT(WRONG  DESTINATION) |
|  | C | Open Failed(Link Rate Not Supported) | IF OPEN_REJECT(LINK RATE NOT SUPPORTED) |
|  | C | Open Failed(Protocol Not Supported) | IF OPEN_REJECT-PROTOCOL NOT SUPPORTED) |
|  | C | Open Failed(Retry) | IF OPEN_REJECT(RETRY) |
|  | C | Open Failed(-Pathway Blocked | IF OPEN_REJECT(PATHWAY BLOCKED ) |
|  | C | Open Failed(No Destination) | IF OPEN-REJECT(NO DESTINATION) |
|  | C | Open Failed(Bad Destination) | IF OPEN_REJECT(WRONG DESTINATION) |
|  | C | Open Failed(STP Resources Busy) | IF OPEN_REJECT(STP RESOURCES BUSY) |
| SL1;SL4 | C | Connection Opened(By SSP Source path) | SSP LINK OPENED BY TX |
|  | C | Connection Opened(By STP Source path) | STP LINK OPENED BY TX |
|  | C | Connection Opened(By SMP Source parh) | SMP LINK OPENED BY TX |
| SL1;SL6 | C | Open Failed(Port Layer Request) | Arbitration terminated due to port layer Stop Arb request |
|  | C | Open Failed(Open Timeout Occurred) | Arbitration terminated due to Open Timeout expired |
| SL1;SL7 | CC | Open Failed(Break Received) | BREAK received during arbitration |
| SL2;Sel | R | Reject Opens | Port layer request link layer to reject opens |
|  | R | Accept Opens | Port layer request link layer to accept opens |
| ~~SL2;SL0~~ | ~~C~~ | ~~Connection Rejected(Retry)~~ | ~~Port layer request link layer to reject opens & open rcved~~ |
|  | ~~C~~ | ~~Connection Rejected(Protocol Not Supported)~~ | ~~Protocol in open frame not supported~~ |
|  | ~~C~~ | ~~Connection Rejected(Wrong Destination)~~ | ~~Destination port in open frame not this SAS port~~ |
|  | ~~C~~ | ~~Connection Rejected(Link Rate Not Supported)~~ | ~~Link rate in open frame not supported~~ |
|  | ~~C~~ | ~~Connection Rejected(Break Received)~~ |  |
| SL2;SL4 | C | Connection Opened(By SSP Destination path) | SSP LINK OPENED by the Receive path |
|  | C | Connection Opened(By STP Destination path) | STP LINK OPENED by the Receive path |
|  | C | Connection Opened(By SMP Destination path) | SMP LINK OPENED by the Receive path |
| SL2;SL7 | C | Connection Closed(Break Received | A BREAK was received while connected |
| SL4: Connected SL4:SL7 | C | Connection Closed(Break Received | A BREAK was received while connected |
| SL5;D Wait |  |  |  |
| SL5;SL0 | C | Connection Closed(Normal) | CLOSE transmitted and received with no errors |
| SL5;SL6 | C | Connection Closed(Close Timeout) | CLOSE timeout exceeded after CLOSE was transmitted |
| SL5;SL7 | C | Connection Closed(Break Received | A BREAK was received while trying to close |
| SL6;Bk Wait |  |  |  |
| SL6;SL0 | C | Connection Closed(Link Broken) | BREAK timeout exceeded after a BREAK was transmitted |

## SSP Link Layer to Port Control Layer Communication - Signals directly pass through

| State | Type | Request/Conformation | Reason |
|---|---|---|---|
| SSP_R1; Rcv | C | ~~Destination ACK/NAK time-out; DONE(ACK/NAK timeout)~~ | ~~ACK/NAK timeout occurred after last transmit~~ |
|  |  | Done Timeout Received(ACK/NAK Timeout) | DONE received with ACK/NAK reason code |
|  |  | ~~Destination credit time-out; DONE(credit time-out)~~ | ~~Credit unavailable for 1 ms after last tx~~ |
|  |  | Done Timeout Received(Credit Timeout) | DONE received with Credit Timeout  reason code |
| ~~SSP_RF1;~~ | ~~C~~ | ~~Protocol Violation;~~ | ~~discard frame 4 conditions but no reason codes~~ |
|  | ~~C~~ | ~~Illegal Frame;~~ | ~~discard frame-consecutive SOF without intervening EOF~~ |
| SSP_RF2; | C | Frame Received ~~number ACK/NAK's txed equal to EOF's received received~~(ACK/NAK Balanced) | frame successfully received |
|  | C | Frame Received ~~:number ACK/NAK's txed not equal to EOF's received(~~ ACK/NAK Not Balanced) | frame successfully received |
|  | ~~C~~ | ~~Failed Frame; frame error(i.e., CRC error)~~ | ~~frame unsuccessfully received~~ |
| SSP_TF1 | R | Tx Frame ~~:Interlocked frame.~~ (Balance Required) | Balance required before frame transmit |
|  | R | Tx Frame ~~:non-Interlocked Frame~~ (Balance Not Required) | Balance not required before frame transmit |
|  | R, | Close Connection |  |
|  | C | Frame Transmitted | Frame transmitted, Acknowledgenent not received |

| | C | Balanced | | ACK/NAKs balanced so port layer free to switch |
|---|---|---|---|---|
| | C | Not Balanced | | ACK/NAKs not balanced so port layer not free to switch |

(These were not confirmations but were statues which changed but which the Port layer could not read.  Don't need anyway because use the Balance required or not on the Tx Frame requests or if issue a Close connection the Link layer will wait for the Ack/Naks to be balanced before executes the close.  The Port layer must wait for the Connection Closed confirmation from the Link layer prior to issuing the next Open to the link layer for another connection request.  Verified with Bill Galloway on 7/3/02).

| SSP_TF2 | C | ACK/NAK time out Timeout | An ACK or a Nak was not rcv within 1 ms from last fm tx |
|---|---|---|---|
| SSP_TF3 | C | Credit Timeout | Credit Timeout since last Tx |
| SSP_TF5 | C | DONE Transmitted | a Done was transmitted  to close the transmit state |
| SSP_D1 | C | DONE Timeout | A DONE was not received within 1 ms of a DONE tx |
| SSP_TIM1 | C | ACK Received | An ACK was just received (for a frame transmitted) |
| | C | NAK Received | A NAK was just received (for a frame transmitted) |

## SAS SMP Link Layer to Port Layer Communication

Port to SMP link (requests):

Transmit Frame
Transport Layer Break
Accept_Reject Opens(Accept)
Accept_Reject Opens(Reject)

SMP link to port (confirmations):

Frame Transmitted
Frame Received
Frame Received Failure

| | |
|---|---|
| Connection Closed(Close Timeout) | CLOSE timeout exceeded after CLOSE was transmitted |
| Connection Closed(Break Received | A BREAK was received while trying to close |
| Connection Closed(Link Broken) | BREAK timeout exceeded after a BREAK was transmitted |

| | |
|---|---|
| Open Failed(Wrong destination) | IF OPEN_REJECT(WRONG  DESTINATION) |
| Open Failed(Link Rate Not Supported) | IF OPEN_REJECT(LINK RATE NOT SUPPORTED) |
| Open Failed(Protocol Not Supported) | IF OPEN_REJECT-PROTOCOL NOT SUPPORTED) |
| Open Failed(Retry) | IF OPEN_REJECT(RETRY) |
| Open Failed(-Pathway Blocked | IF OPEN_REJECT(PATHWAY BLOCKED) |
| Open Failed(No Destination) | IF OPEN-REJECT(NO DESTINATION) |
| Open Failed(Bad Destination) | IF OPEN_REJECT(WRONG DESTINATION) |
| Open Failed(STP Resources Busy) | IF OPEN_REJECT(STP RESOURCES BUSY) |
| Open Failed(Port Layer Request) | Arbitration terminated due to port layer Stop Arb request |
| Open Failed(Open Timeout Occurred) | Arbitration terminated due to Open Timeout expired |
| Open Failed(Break Received) | BREAK received during arbitration |