The following extract of the *External Mode target debug message log* (level 2) is analyzed to determine the cause of a deadlock situation observed when after a parameter download from the host to the target. Note that, with debug messaging switched on (level 2), the target does not have enough time in the background task to upload every packet individually. Every upload thus includes an entire set of packets (e.g. 0x00000110 = 266 bytes, see below). On the host, this manifests itself in a “slightly jumpy” display of the scope blocks . For details about how the deadlock situation occurs [see page 8 ff](#explanation).

(…)

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] ser<ISR>ial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] se<ISR>rial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x3<LF>

-[2] serial\_set\_string: Sending 0x3<LF>

[1] Ex<ISR>tSetPktWithACK: ExtMode packet sent, setting waitForAck to TRUE<LF>

<ISR><2 0x7E 0x7E 0x2 0x0 0x0 0x0 0x0 0x3 0x3><LF>

[ 0x7E 0x7E 0x2 0x0 0x0 0x0 <ISR>0x0 0x3 0x3 ]<LF>

[1] ExtGetPktBlocking: Received ACK\_PACKET -> waitForAck = FALSE;<LF>

[1] ExtSetPkt: waitForAck = FA<ISR>LSE -> clear to send<LF>

-[2] serial\_set\_string: Sending 0x7E<LF>

-[2] serial\_set\_string: Sending 0x7E<LF>

-[2] serial\_s<ISR>et\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x10<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial<ISR>\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] seria<ISR>l\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] seri<ISR>al\_set\_string: Sending 0x41<LF>

-[2] serial\_set\_string: Sending 0x9B<LF>

-[2] serial\_set\_string: Sending 0x5C<LF>

-[2] <ISRserial\_set\_string: Sending 0x28<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] <ISR>serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3F<LF>

-[2<ISR>] serial\_set\_string: Sending 0x8C<LF>

-[2] serial\_set\_string: Sending 0xCC<LF>

-[2] serial\_set\_string: Sending 0xCC<LF><ISR>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<ISR><LF>

-[2] serial\_set\_string: Sending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0<ISR>x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending <ISR> 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending <ISR> 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending<ISR> 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sendin<ISR>g 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sendi<ISR>ng 0x41<LF>

-[2] serial\_set\_string: Sending 0x9B<LF>

-[2] serial\_set\_string: Sending 0x85<LF>

-[2] serial\_set\_string: S<ISR>ending 0x1E<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string:<ISR> Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3F<LF>

-[2] serial\_set\_strin<ISR>g: Sending 0x99<LF>

-[2] serial\_set\_string: Sending 0x99<LF>

-[2] serial\_set\_string: Sending 0x99<LF>

-[2] serial\_set\_st<ISR>ring: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_s<ISR>tring: Sending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set<ISR>\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_s<ISR>et\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_<ISR>set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial<ISR>\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial<ISR>\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x41<LF>

-[2] seri<ISR>al\_set\_string: Sending 0x9B<LF>

-[2] serial\_set\_string: Sending 0xAE<LF>

-[2] serial\_set\_string: Sending 0x14<LF>

-[2] <ISR>serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2]<ISR> serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3F<LF>

-[2] serial\_set\_string: Sending 0xA6<LF>

-<ISR>[2] serial\_set\_string: Sending 0x66<LF>

-[2] serial\_set\_string: Sending 0x66<LF>

-[2] serial\_set\_string: Sending 0x0<ISR><LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x<ISR1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x<ISR>0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending <ISR>0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending <ISR> 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending<ISR> 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sendin<ISR>g 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x41<LF>

-[2] serial\_set\_string: Send<ISR>ing 0x9B<LF>

-[2] serial\_set\_string: Sending 0xD7<LF>

-[2] serial\_set\_string: Sending 0xA<LF>

-[2] serial\_set\_string: Se<ISR>nding 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: S<ISR>ending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3F<LF>

-[2] serial\_set\_string: Sending 0xB3<LF>

-[2] serial\_set\_string<ISR>: Sending 0x33<LF>

-[2] serial\_set\_string: Sending 0x33<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_str<ISR>ing: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1A<LF>

-[2] serial\_set\_s<ISR>tring: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_<ISR>string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_se<ISR>t\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_se<ISR>t\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_s<ISR>et\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_<ISR>set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x41<LF>

-[2] serial\_set\_string: Sending 0x9B<LF>

-[2] seri<ISR>al\_set\_string: Sending 0xFF<LF>

-[2] serial\_set\_string: Sending 0xFF<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] s<ISR>erial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] <ISR>serial\_set\_string: Sending 0x3F<LF>

-[2] serial\_set\_string: Sending 0xC0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2<ISR>] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[<ISR>2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

<ISR>-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<ISR><LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x<ISR>0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0<ISR>x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending <ISR>0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending <ISR>0x0<LF>

-[2] serial\_set\_string: Sending 0x41<LF>

-[2] serial\_set\_string: Sending 0x9C<LF>

-[2] serial\_set\_string: Sendin<ISR>g 0x28<LF>

-[2] serial\_set\_string: Sending 0xF5<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sen<ISR>ding 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Se<ISR>nding 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: S<ISR>ending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: <ISR>Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string:<ISR> Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_strin<ISR>g: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_stri<ISR>ng: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_str<ISR>ing: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_st<ISR>ring: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_s<ISR>tring: Sending 0x41<LF>

-[2] serial\_set\_string: Sending 0x9C<LF>

-[2] serial\_set\_string: Sending 0x51<LF>

-[2] serial\_s<ISRet\_string: Sending 0xEB<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_s<ISR>et\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3D<LF>

-[2] serial<ISR>\_set\_string: Sending 0xCC<LF>

-[2] serial\_set\_string: Sending 0xCC<LF>

-[2] serial\_set\_string: Sending 0xCC<LF>

-[2] se<ISR>rial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] s<ISR>erial\_set\_string: Sending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2]<ISR> serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[<ISR>2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[<ISR>2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-<ISR>[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

<ISR>-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x41<ISR><LF>

-[2] serial\_set\_string: Sending 0x9C<LF>

-[2] serial\_set\_string: Sending 0x7A<LF>

-[2] serial\_set\_string: Sending <ISR>0xE1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending<ISR> 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3E<LF>

-[2] serial\_set\_string: Sendi<ISR>ng 0x4C<LF>

-[2] serial\_set\_string: Sending 0xCC<LF>

-[2] serial\_set\_string: Sending 0xCC<LF>

-[2] serial\_set\_string: Se<ISR>nding 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: S<ISR>ending 0x1A<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string:<ISR> Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x18<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_strin<ISR>g: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_stri<ISR>ng: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_str<ISR>ing: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_str<ISR>ing: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x41<LF>

-[2] serial\_set\_s<ISR>tring: Sending 0x9C<LF>

-[2] serial\_set\_string: Sending 0xA3<LF>

-[2] serial\_set\_string: Sending 0xD6<LF>

-[2] serial\_s<ISR>et\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_<ISR>set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x3E<LF>

-[2] serial\_set\_string: Sending 0x99<LF>

-[2] seri<ISR>al\_set\_string: Sending 0x99<LF>

-[2] serial\_set\_string: Sending 0x99<LF>

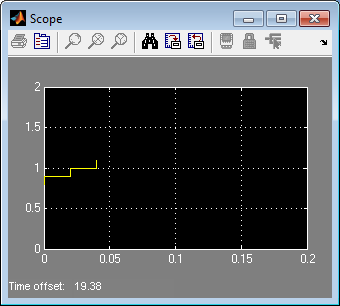
-[2] serial\_set\_string: Sending 0x3<LF>

-[2] s<ISR>erial\_set\_string: Sending 0x3<LF>

[1] ExtSetPktWithACK: ExtMode packet sent, setting waitForAck to TRUE<LF>

-[2] SendP<ISR>ktToHost: Sending action Packet type is **EXT\_TERMINATE\_LOG\_EVENT (31) with size 4**<LF>

At this moment (t =0x419CA3D6 = 19.579998 s ≈ 19.58 s, signal value: 0x3E999999 = 0.3999994 ≈ 0.4), the target is ready to notify the host of a “scope trigger point” event. Note that t = 19.58 s represents the end of such a trigger interval (see scope below). This notification of the host is done by first sending an **EXT\_TERMINATE\_LOG\_EVENT (31)** packet announcing a subsequent event data packet with event data size **4**. The target thus intends to send two packets in a row.



However, before being able to actually transmit the EXT\_TERMINATE\_LOG\_EVENT packet, a packet from the host is intercepted: **EXT\_SETPARAM (4)**, announcing the download of a parameter set of size **0x18** = 24 bytes). Note that the **ACK\_PACKET** of the previously sent log data has also arrived and remains in the RX ring buffer.

The interception of the EXT\_SETPARAM packet is acknowledged by sending an ACK\_PACKET to the host. The host is thereby granted permission to send the announced parameter set.

-[2] Send<ISR>PktToHost: Sending action Packet type is EXT\_TERMINATE\_LOG\_EVENT (31) with size 4

<2 0x7E 0x7E 0x1 0x8 0x0 0x0 0x0<ISR> 0x0 0x0 0x0 **0x4** **0x0 0x0 0x0 0x18** 0x3 0x3 **0x7E 0x7E 0x2 0x0 0x0 0x0 0x0 0x3 0x3**><LF>

[ 0x7E 0x7E 0x1 0x0 0x0 0x0 0<ISR>x8 0x0 0x0 0x0 0x4 0x0 0x0 0x0 0x18 0x3 0x3 ]<LF>

-[2] ExtGetPktBlocking: Storing received EXTMODE\_PACKET in FIFO buffer

-[2] serial\_set\_string: Sending 0x7E<LF>

-[2] serial\_set\_string: Sen<ISR>ding 0x7E<LF>

-[2] serial\_set\_string: Sending 0x2<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: S<ISR>ending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: <ISR>Sending 0x3<LF>

-[2] serial\_set\_string: Sending 0x3<LF>

The interception of the EXT\_SETPARAM packet is acknowledged by sending an ACK\_PACKET to the host. The host is thereby granted permission to send the announced parameter set.

<2 **0x7E 0x7E 0x2 0x0 0x0 0x0 0x0 0x3 0x3**><LF>

[ 0x7E 0x7E 0x2 0x<ISR>0 0x0 0x0 0x0 0x3 0x3 ]<LF>

[1] ExtGetPktBlocking: Received ACK\_PACKET -> waitForAck = FALSE;<LF>

As expected, the next call to *ExtSerialPortDataPending* indicates that another valid packet is available in the RX ring buffer (the previously received **ACK\_PACKET**, acknowledging the correct receipt of the last transmitted log data). Consequently, variable *waitForAck* is reset (FALSE), i. e. the target is now clear to send the still pending **EXT\_TERMINATE\_LOG\_EVENT** packet (31 = **0x1F**, event data size **4**). This is done through a call to function *SendPktHdrToHost* which in turn calls *ExtSetPkt:*

[1] ExtSetPkt: waitFo<ISR>rAck = FALSE -> clear to send<LF>

-[2] serial\_set\_string: Sending 0x7E<LF>

-[2] serial\_set\_string: Sending 0x7E<LF>

-[2]<ISR> serial\_set\_string: Sending 0x1<LF>

-[2] serial\_set\_string: Sending 0x8<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2<ISR>] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending 0x0<LF>

-[2] serial\_set\_string: Sending **0x0**<LF>

-[<ISR>2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x1F**<LF>

-<ISR>[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x0**<LF>

<ISR>-[2] serial\_set\_string: Sending **0x4**<LF>

-[2] serial\_set\_string: Sending 0x3<LF>

-[2] serial\_set\_string: Sending 0x3<LF><ISR>

[1] ExtSetPktWithACK: ExtMode packet sent, setting waitForAck to TRUE<LF>

-[2] SendPktToHost: ... action and size s<ISR>ent.<LF>

The transmission of the EXT\_TERMINATE\_LOG\_EVENT packet (“action and size”) needs acknowledgement by the host: Variable *waitForAck* is thus set to TRUE, thereby preventing the target from sending any further data until an ACK\_PACKET is received.

To transmit the actual event data of the EXT\_TERMINATE\_LOG\_EVENT (🡪 event data size: 4 bytes), the target now makes a call to *SendPktDataToHost* which, in turn, calls *ExtSetHostPkt* which calls *ExtSetPktWithACK* which finally passes control on to *ExtSetPkt*.

At this stage, **the target is waiting for an ACK\_PACKET** (response to the previously transmitted EXT\_TERMINATE\_LOG\_EVENT) as well as for an EXT\_PACKET (the still outstanding parameter set packet). ***The order in which these two packets are sent by the host is undetermined, as it depends on an asynchronous event (🡪 the initiation of the SET\_PARAM telegram on the host).***

The debug message log indicates that, while waiting for the expected ACK\_PACKET, function *ExtSetPkt* intercepts the still outstanding parameter set packet (**0x18** bytes, the last 4 data bytes represent the modified gain value: **0x3E19999A** = 0.15). This packet is fetched from the RX ring buffer by a call to *ExtGetPktBlocking* which in turn calls *GetExtSerialPkt* (ext\_serial\_pkt.c) returning the received packet in variable *InBuffer*. Since the packet is not of type ACK\_PACKT, it is stored in the *FIFOPkt* queue for later processing (🡪 call to *SavePkt)*.

Provided the *FIFOFree* queue is not empty, i.e. the *FIFOPkt* queue is not full (= at least one more packet can be intercepted and stored), function *ExtSetPkt* is called again (recursion) to send an ACK\_PACKET, thereby acknowledging the receipt of the intercepted parameter set packet.

Note: *ExtSetPkt* must never be called when the *FIFOPkt* queue is full, as this function blocks until variable *waitForAck* assumes the value *false*, which occurs when an ACK\_PACKET is received. However, as the possibility of intercepting an incoming EXT\_PACKET can never be ruled out, there needs to be space in the *FIFOPkt* queue to store this packet.

The debug message log indicates that the **ACK\_PACKET** acknowledging the receipt of the parameter set packet is in fact written to the TX ring buffer (= sent to the host). **However, it seems that the host does not receive/notice this latest ACK\_PACKET**, thereby entering a deadlock situation.

-[2] SendPktToHost: Sending data...<LF>

<2 0x7E 0x7E 0x1 **0x18 0x0 0x0 0x0 0x0 0x0 0x0 0x1 0x0 0x0 0x0 0x0 0x0 <ISR>0x0 0x0 0x0 0x0 0x0 0x0 0x1 0x0 0x0 0x0 0x0 0x3E 0x19 0x99 0x9A** 0x3 0x3><LF>

[ 0x7E 0x7E 0x1 0x0 0x0 0x0 0x18 0<ISR>x0 0x0 0x0 0x1 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x1 0x0 0x0 0x0 0x0 0x3E 0x19 0x99 0x9A 0x3 0x3 ]<LF>

-[2<ISR>] serial\_set\_string: Sending **0x7E**<LF>

-[2] serial\_set\_string: Sending **0x7E**<LF>

-[2] serial\_set\_string: Sending **0x2**<LF>

<ISR>-[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x0**<LF><ISR>

-[2] serial\_set\_string: Sending **0x0**<LF>

-[2] serial\_set\_string: Sending **0x3**<LF>

-[2] serial\_set\_string: Sending **0x3**<ISR><LF>

<ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR><ISR

This constitutes the following deadlock situation:

In order to get clearance for the transmission of the event data (event data size: 4 bytes), the target still requires reception of an ACK\_PACKET, acknowledging the error-free reception on the host of the previously sent EXT\_TERMINATE\_LOG\_EVENT packet.

The host on the other hand also awaits an ACK\_PACKET from the target (in response to the parameter set packet sent by Simulink): Following the user action of changing a model parameter, SL invokes callback function *ExtSendGenericPkt* which in turn calls upon *ExtSetTargetPkt* to send the **EXT\_SETPARAM (4)** packet, thereby announcing the download of a parameter set of size **0x18** = 24 bytes). Since *ExtSetTargetPkt* calls *ExtSetPktWithACK* – which, in turn, calls *ExtSetPkt –* the host now requires an ACK\_PACKET from the target before proceeding with the sending of the actual parameter set packet. This is the ACK\_PACKET which has been sent by the target (see above), yet it is not received or noticed on the host.

Note that, symmetrically to the program flow on the target, the blockage of the host transmission occurs in function *ExtSetPkt* which is entered when the Simulink callback function *ExtSendGenericPkt* calls upon *ExtSetTargetPkt* (🡪 calling *ExtSetPktWithACK*, 🡪 calling *ExtSetPkt)* to send the actual parameter set data. However, function *ExtSetPkt* cannot transmit anything until an ACK\_PACKET is received from the target.