## **ex\_trcread**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | |  | | | | | | |
|  | RUN | × | BRK | | ○ | |
|  | | | | | | | | | | | |  |
| Functions supported only in <OCD2, OCD3> | | | | | | | | | | | |  |
|  | | | | | | | | | | | |  |
| [Function] | | | | | | | | | | | |  |
|  | Read the trace data. | | | | | | | | | | |  |
|  |  | | | | | | | | | | |  |
| [Format] | | | | | | | | | | | |  |
|  | int ex\_trcread( EXTRREAD \*rd, ULONG \*tp) | | | | | | | | | | |  |
|  |  | | | | | | | | | | |  |
|  |  | type | Argument name | Attributes | Explanation | | | | | 使用 | |  |
|  |  | EXTRREAD | \*rd | <IO> | Trace read data structure | | | | | ○ | |  |
|  |  | ULONG | \*tp | <O> | Frame number indicated by the trace read start pointer | | | | | ○ | |  |
|  |  |  | | | | | | | | | |  |
|  |  | typedef struct{ | | | | | | | |  | |  |
|  |  | USHORT | mode | <I> | Type of frame to read | | | | | ○ | |  |
|  |  | USHORT | direct | <I> | Read direction | | | | | ○ | |  |
|  |  | ULONG | num | <I> | Number of frames to read | | | | | ○ | |  |
|  |  | ULONG | rnum | <O> | Number of frames read | | | | | ○ | |  |
|  |  | ULONG | dsize | <O> | Number of bytes of trace data | | | | | ○ | |  |
|  |  | UCHAR | \*data | <O> | Trace data | | | | | ○ | |  |
|  |  | } EXTRREAD | | | | | | | |  | |  |
|  |  |  | | | | | | | | | |  |
|  |  | In the case of the RL78 OCD, the trace data is stored in the structure TRCDAT2 in units of one frame.  When a plurality of frames are read, an array is formed, and the address of the first element is stored in \* data.  TRCDAT2 is a structure that is not defined in the provided header file, so when reading EXTRCDAT, each time one frame is read, the address of \* data is read forward by 4 bytes (skipping fm\_type). | | | | | | | | | |  |
|  |  | Typedef struct{ | | | | | | | |  | |  |
|  |  | ULONG | fm\_type | <O> | Frame type | | | | | ○ | |  |
|  |  | EXTRCDAT | fm\_data | <O> | Frame data | | | | | ○ | |  |
|  |  | } TRCDAT2 | | | | | | | |  | |  |
|  |  |  | | | | | | | | | |  |
|  |  | typedef struct{ | | | | | | | |  | |  |
|  |  | ULONG | framno | <O> | Trace frame number | | | | | ○ | |  |
|  |  | USHORT | sts1 | <O> | Trace operation status information | | | | | ○ | |  |
|  |  | USHORT | sts2 | <O> | Valid data information | | | | | ○ | |  |
|  |  | USHORT | sts3 | ― | ― | | | | | ― | |  |
|  |  | USHORT | sts4 | ― | ― | | | | | ― | |  |
|  |  | ULONG | faddr | <0> | Branch source address | | | | | ○ | |  |
|  |  | ULONG | fdata | ― | ― | | | | | ― | |  |
|  |  | USHORT | ext | ― | ― | | | | | ― | |  |
|  |  | USHORT | dummy1 | ― | ― | | | | | ― | |  |
|  |  | ULONG | raddr | ― | ― | | | | | ― | |  |
|  |  | ULONG | rdata | ― | ― | | | | | ― | |  |
|  |  | ULONG | waddr | ― | ― | | | | | ― | |  |
|  |  | ULONG | wdata | ― | ― | | | | | ― | |  |
|  |  | ULONG | time | ― | ― | | | | | ― | |  |
|  |  | ULONG | jaddr | ― | ― | | | | | ― | |  |
|  |  | USHORT | ncode | ― | ― | | | | | ― | |  |
|  |  | USHORT | dummy2 | ― | ― | | | | | ― | |  |
|  |  | UCHAR | disasm[8] | ― | ― | | | | | ― | |  |
|  |  | } EXTRCDAT | | | | | | | |  | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [Parameters] | | | | | | | | | | | | |  |
|  |  | | rd | | | | | | | | | |  |
|  |  | |  | | mode | EX\_ALL1\_DATA | | | | | | All frames (fixed) |  |
|  |  | | direct | EX\_DIR\_PLUS | | | | | | + Direction (moved to new one) (fixed) |  |
|  |  | | num | <1～trcmem\_size> | | | | | | Specify the number of frames to read |  |
|  |  | | rnum | <0～num> | | | | | | Returns the number of frames read. |  |
|  |  | | Dsize | <0 to trcmem\_size \* TRCDAT2 size> | | | | | | Returns the number of bytes of trace data |  |
|  |  | | \*data | Returns trace data | | | | | | |  |
|  |  | | tp | | | <0～(trcmem\_size-1)> | | | | | | Trace frame number indicated by the trace read start pointer after reading |  |
|  |  | |  | |  | | \* Trcmem\_size is the maximum number of trace frames acquired by ex\_getenv (). | | | | | |  |
|  |  | |  | |  | |  | | | | | |  |
|  |  | | Data(TRCDAT2) | | | | | | | | | |  |
|  |  | |  | | fm\_type | EX\_PRO\_TRCDATA | | | | | Trace data of user program (fixed) | |  |
|  |  | | fm\_data | Trace data structure (EXTRCDAT) | | | | | | |  |
|  |  | |  | |  | |  | | | | | |  |
|  |  | | fm\_data(EXTRCDAT) | | | | | | | | | |  |
|  |  | |  | | framno | <0～(trcmem\_size-1)> | | | | | Returns the trace frame number | |  |
|  |  | | sts1 | bit0 | | | | 1 fixed | All traces, section traces (always returns 1) | |  |
|  |  | | bit4 | | | | 1 fixed | Event cycle trace (always returns 1) | |  |
|  |  | | bit6 | | | | 0 | Other than below | |  |
|  |  | | 1 | When the trace operation mode is all trace, overwrite mode, and the last trace frame number | |  |
|  |  | | Bits other than the above | | | | | 0 fixed | |  |
|  |  | | sts2 | bit0 | | | 0 | | Invalid data | |  |
|  |  | | 1 | | valid data | |  |
|  |  | | Other than those above | | | 0 fixed | | Reservation | |  |
|  |  | | faddr | <0～7FFFFH> | | | | | Branch source address | |  |
|  |  | |  | |  | |  | | | | | |  |
| [Return Values] | | | | | | | | | | | | |  |
|  | |  | | EX\_NOERROR | | | | normal | | | | |  |
|  | |  | | EX\_FE\_COMM | | | | Communication not open | | | | |  |
|  | |  | | EX\_PE\_DATA | | | | Setting value is abnormal | | | | |  |
|  | |  | | EX\_SE\_USRPGMRUN | | | | During execution of user program | | | | |  |
|  | |  | | EX\_SE\_NOTRACE | | | | No measurements were taken | | | | |  |
|  | |  | | EX\_NOSUPRT | | | | This function is not supported | | | | |  |
|  | |  | | See also “5. Common EXEC Function Errors (P2)”. | | | | | | | | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [Description] | | | | | | |  |  |  |  |  |
|  |  | | ・ | | Read the trace data as follows.  From the frame pointed to by the trace read start pointer, set num frames in the direct direction to frames that match the mode conditions, or the latest or oldest trace frame in the data buffer, and rnum is the number of frames set in the data buffer , Dsize returns the number of bytes set in the data buffer. | | | | | |  |
|  |  | | ・ | | \* tp returns the trace read start pointer after reading.  This returns the frame number next to the last read frame number.  However, if it is the latest frame, the last frame number is returned. | | | | | |  |
|  |  | | ・ | | direct reads the trace frame in the fixed + direction (going to the new direction). If a direction other than the + direction is set, it is ignored and read in the + direction. | | | | | |  |
|  |  | | ・ | | If the number of frames from the trace read start pointer to the last frame is less than the required number of frames, the trace data read up to the last frame is returned, and the return value is EX\_NOERROR because reading beyond the last frame is not possible. . In this case, num> rnum. | | | | | |  |
|  |  | | ・ | | If the last frame number of the read frame is equal to the value of \* tp, it can be determined that the latest frame has been read. | | | | | |  |
|  |  | | ・ | | The trace read pointer is a pointer that points to a frame at which reading is started by ex\_trcread (), and moves due to the following factors. | | | | | |  |
|  |  | |  | | - | When the execution of the user program is stopped, the process moves to the last frame (the latest frame) written in the tracer. | | | | |  |
|  |  | |  | | - | Move to the next frame when trace data is read by ex\_trcread (). | | | | |  |
|  |  | |  | | - | Move to the specified frame with ex\_trcseek (). | | | | |  |
|  |  | |  | | Information for determining whether the frame is the latest trace frame is added to bit6 of sts1 in each trace frame.  This information is valid for trace frames acquired with ex\_trcmode () set to all traces (tmode = EX\_ALL\_TRC) and non-stop trace memory (fullstop = EX\_NON\_STOP).  The latest trace frame is the count result obtained by ex\_trcdatacount () This is the latest trace frame having a frame number (frameno) that is -1 from (\* cntrst). | | | | | |  |
|  |  | |  | |  | | | | | |  |
| [Error] | | | | | | | | | | |  |
|  |  | ・ | | If a value other than the defined value described in [Parameters] is specified for mode and direct, an error (EX\_PE\_DATA) is returned. | | | | | | |  |
|  |  | ・ | | If the user program is running, an error (EX\_SE\_USRPGMRUN) is returned and no processing is performed. | | | | | | |  |
|  |  | ・ | | If no trace data is recorded or the trace data is cleared with ex\_trcclear (), an error (EX\_SE\_NOTRACE) is returned and no processing is performed. | | | | | | |  |
|  | < Other than OCD2, OCD3 > | | | | | | | | | |  |
|  |  |  | | If this function is used, an error (EX\_NOSUPRT) is returned and no processing is performed. | | | | | | |  |
|  |  |  | |  | | | | | | |  |
| [Notes] | | | | | | | | | | |  |
|  |  | ・ | | There are many other modes and trace data types in EXECs other than RL78 OCD, but RL78 OCD supports only those described in this specification. | | | | | | |  |