

EPICS Device and Driver Support for SNS RTDL Master Modules

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A U.S. Department of Energy Multilaboratory Project

S P A L L A T I O N N E U T R O N S O U R C E

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EPICS Device and Driver Support for SNS RTDL Master
(Beta Release)

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1. Introduction

This EPICS software supports the following VME boards used for SNS RTDL master IOC:

VME Board ID	Description
V106	RTDL Input Module
V105S	RTDL Encoder Module

2. EPICS device support Definitions for RTDL Input Module and Encoder Module

```
# EPICS Device Support for RTDL Input Module
device(stringin,INST_IO,devStringinRtdlInput,"RtdlInput")
device(longin,INST_IO,devLiRtdlInput,"RtdlInput")
device(longout,INST_IO,devLoRtdlInput,"RtdlInput")
device(bi,INST_IO,devBiRtdlInput,"RtdlInput")
device(bo,INST_IO,devBoRtdlInput,"RtdlInput")

# EPICS Device Support for RTDL Encoder Module
device(stringin,INST_IO,devStringinRtdlEncoder,"RtdlEncoder")
device(longin,INST_IO,devLiRtdlEncoder,"RtdlEncoder")
device(bi,INST_IO,devBiRtdlEncoder,"RtdlEncoder")
device(bo,INST_IO,devBoRtdlEncoder,"RtdlEncoder")
```

3. Driver Initialization

Before using RTDL master driver, rtdlDrv() must be called directly to install the driver in the VxWorks I/O system. RtdlDevCreate() must then be called to initialize and install each device.

```
#install rtdl driver
rtdlDrv()

#init rtdl devices
rtdlDevCreate <device name>, base-address, <module-type>, <Int #>, <Int Level>

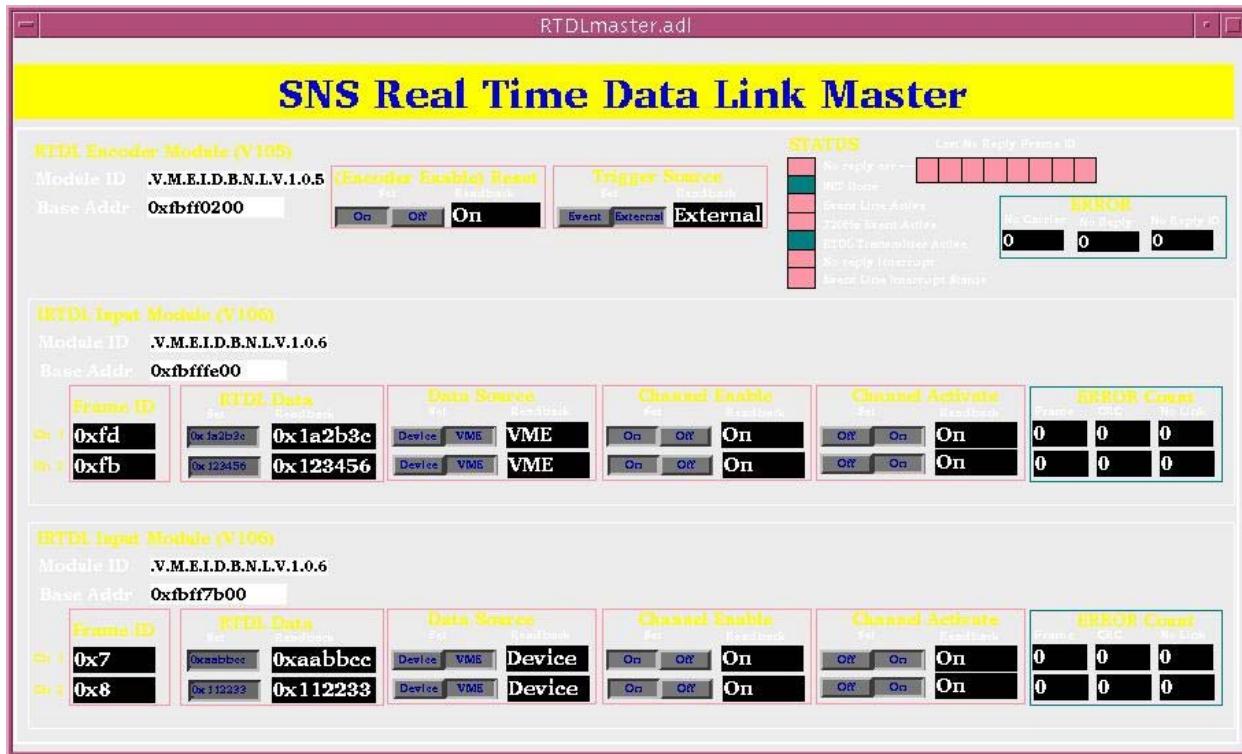
#where <module-type> is 1 for Encoder (v105)
          0 for Input (v106)
```

Example:

```
rtdlDevCreate "/dev/rtdlE", 0x200, 1, 0x1a, 3
rtdlDevCreate "/dev/rtdlIA", 0xfe00, 0, 0x1b, 3
```

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4. Operator Screen Sample



5. Sample EPICS database for using RTDL Master EPICS Support

```
# EPICS database for RTDL Encoder Module
record(longin,rtdlE_NO_REPLY_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 0")
}

record(longin,rtdlE_NO_REPLY_ERROR_ID_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 1")
}

record(longin,rtdlE_NO_CARRIER_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 2")
}

record(longin,rtdlE_STATUS_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 3")
}

record(stringin,rtdlE_BOARD_ID_G) {
```

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```
        field(SCAN,"Passive")
        field(DTYP,"RtdlEncoder")
        field(INP, "INST_IO @/dev/rtdlE 0")
    }

record(stringin,rtdlE_BASE_ADDRESS_G) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 1")
}

record(bi,rtdlE_TRIGGER_SOURCE_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP,"INST_IO @/dev/rtdlE 0")
    field(ZNAM,"Event")
    field(ONAM,"External")
}

record(bo,rtdlE_TRIGGER_SOURCE_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlEncoder")
    field(OUT,"INST_IO @/dev/rtdlE 0")
    field(ZNAM,"Event")
    field(ONAM,"External")
}

record(bi,rtdlE_RESET_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlEncoder")
    field(INP,"INST_IO @/dev/rtdlE 2")
    field(ZNAM,"On")
    field(ONAM,"Off")
}

record(bo,rtdlE_RESET_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlEncoder")
    field(OUT,"INST_IO @/dev/rtdlE 2")
    field(ZNAM,"On")
    field(ONAM,"Off")
}

# EPICS database for RTDL Input module
record(stringin,rtdlIA1_BOARD_ID_G) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 0")
}

record(stringin,rtdlIA1_BASE_ADDRESS_G) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 1")
}

record(longin,rtdlIA1_FRAME_ID_G) {
```

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```
        field(SCAN,"Passive")
        field(DTYP,"RtdlInput")
        field(INP, "INST_IO @/dev/rtdlIA/1 0")
    }

record(longin,rtdlIA2_FRAME_ID_G) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/2 0")
}

record(longin,rtdlIA1_VME_DATA_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 1")
}

record(longin,rtdlIA2_VME_DATA_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/2 1")
}

record(longin,rtdlIA1_FRAME_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 2")
}

record(longin,rtdlIA2_FRAME_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/2 2")
}

record(longin,rtdlIA1_CRC_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 3")
}

record(longin,rtdlIA2_CRC_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/2 3")
}

record(longin,rtdlIA1_LINK_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/1 4")
}

record(longin,rtdlIA2_LINK_ERROR_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP, "INST_IO @/dev/rtdlIA/2 4")
```

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```
}
record(longout,rtdlIA1_VME_DATA_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(OUT, "INST_IO @/dev/rtdlIA/1 0")
}

record(longout,rtdlIA2_VME_DATA_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(OUT, "INST_IO @/dev/rtdlIA/2 0")
}

record(bi,rtdlIA1_MODE_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP,"INST_IO @/dev/rtdlIA/1 0")
    field(ZNAM,"Device")
    field(ONAM,"VME")
}

record(bi,rtdlIA2_MODE_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP,"INST_IO @/dev/rtdlIA/2 0")
    field(ZNAM,"Device")
    field(ONAM,"VME")
}

record(bi,rtdlIA1_Enable_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP,"INST_IO @/dev/rtdlIA/1 1")
    field(ZNAM,"On")
    field(ONAM,"Off")
}

record(bi,rtdlIA2_Enable_G) {
    field(SCAN,"1 second")
    field(DTYP,"RtdlInput")
    field(INP,"INST_IO @/dev/rtdlIA/2 1")
    field(ZNAM,"On")
    field(ONAM,"Off")
}

record(bo,rtdlIA1_MODE_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
    field(OUT,"INST_IO @/dev/rtdlIA/1 0")
    field(ZNAM,"Device")
    field(ONAM,"VME")
}

record(bo,rtdlIA2_MODE_S) {
    field(SCAN,"Passive")
    field(DTYP,"RtdlInput")
```

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```
        field(OUT, "INST_IO @/dev/rtdlIA/2 0")
        field(ZNAM, "Device")
        field(ONAM, "VME")
    }

record(bo,rtdlIA1_Enable_S) {
    field(SCAN, "Passive")
    field(DTYP, "RtdlInput")
    field(OUT, "INST_IO @/dev/rtdlIA/1 1")
    field(ZNAM, "On")
    field(ONAM, "Off")
}

record(bo,rtdlIA2_Enable_S) {
    field(SCAN, "Passive")
    field(DTYP, "RtdlInput")
    field(OUT, "INST_IO @/dev/rtdlIA/2 1")
    field(ZNAM, "On")
    field(ONAM, "Off")
}

record(bi,rtdlIA1_ACTIVATE_G) {
    field(SCAN, "1 second")
    field(DTYP, "RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 1 /dev/rtdlIA/1")
    field(ZNAM, "Off")
    field(ONAM, "On")
}

record(bi,rtdlIA2_ACTIVATE_G) {
    field(SCAN, "1 second")
    field(DTYP, "RtdlEncoder")
    field(INP, "INST_IO @/dev/rtdlE 1 /dev/rtdlIA/2")
    field(ZNAM, "Off")
    field(ONAM, "On")
}

record(bo,rtdlIA1_ACTIVATE_S) {
    field(SCAN, "Passive")
    field(DTYP, "RtdlEncoder")
    field(OUT, "INST_IO @/dev/rtdlE 1 /dev/rtdlIA/1")
    field(ZNAM, "Off")
    field(ONAM, "On")
}

record(bo,rtdlIA2_ACTIVATE_S) {
    field(SCAN, "Passive")
    field(DTYP, "RtdlEncoder")
    field(OUT, "INST_IO @/dev/rtdlE 1 /dev/rtdlIA/2")
    field(ZNAM, "Off")
    field(ONAM, "On")
}
```