

1. Configure the I²S module using the CONFIG registers

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// Enable reception
NRF_I2S->CONFIG.RXEN = (I2S_CONFIG_RXEN_RXEN_Enabled <<
                           I2S_CONFIG_RXEN_RXEN_Pos);

// Enable transmission
NRF_I2S->CONFIG.TXEN = (I2S_CONFIG_TXEN_TXEN_Enabled <<
                           I2S_CONFIG_TXEN_TXEN_Pos);

// Enable MCK generator
NRF_I2S->CONFIG.MCKEN = (I2S_CONFIG_MCKEN_MCKEN_Enabled <<
                           I2S_CONFIG_MCKEN_MCKEN_Pos);

// MCKFREQ = 4 MHz
NRF_I2S->CONFIG.MCKFREQ = I2S_CONFIG_MCKFREQ_MCKFREQ_32MDIV8 <<
                           I2S_CONFIG_MCKFREQ_MCKFREQ_Pos;

// Ratio = 256
NRF_I2S->CONFIG.RATIO = I2S_CONFIG_RATIO_RATIO_256X <<
                           I2S_CONFIG_RATIO_RATIO_Pos;

// MCKFREQ = 4 MHz and Ratio = 256 gives sample rate = 15.625 ks/s
// Sample width = 16 bit
NRF_I2S->CONFIG.SWIDTH = I2S_CONFIG_SWIDTH_SWIDTH_16Bit <<
                           I2S_CONFIG_SWIDTH_SWIDTH_Pos;

// Alignment = Left
NRF_I2S->CONFIG.ALIGN = I2S_CONFIG_ALIGN_ALIGN_Left <<
                           I2S_CONFIG_ALIGN_ALIGN_Pos;

// Format = I2S
NRF_I2S->CONFIG.FORMAT = I2S_CONFIG_FORMAT_FORMAT_I2S <<
                           I2S_CONFIG_FORMAT_FORMAT_Pos;

// Use stereo
NRF_I2S->CONFIG.CHANNELS = I2S_CONFIG_CHANNELS_CHANNELS_Stereo <<
                           I2S_CONFIG_CHANNELS_CHANNELS_Pos;

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2. Map IO pins using the PINSEL registers

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// MCK routed to pin 0
NRF_I2S->PSEL.MCK = (0 << I2S_PSEL_MCK_PIN_Pos) |
                      (I2S_PSEL_MCK_CONNECT_Connected <<
                           I2S_PSEL_MCK_CONNECT_Pos);

// SCK routed to pin 1
NRF_I2S->PSEL.SCK = (1 << I2S_PSEL_SCK_PIN_Pos) |
                      (I2S_PSEL_SCK_CONNECT_Connected <<
                           I2S_PSEL_SCK_CONNECT_Pos);

// LRCK routed to pin 2
NRF_I2S->PSEL.LRCK = (2 << I2S_PSEL_LRCK_PIN_Pos) |
                      (I2S_PSEL_LRCK_CONNECT_Connected <<
                           I2S_PSEL_LRCK_CONNECT_Pos);

// SDOUT routed to pin 3
NRF_I2S->PSEL.SDOUT = (3 << I2S_PSEL_SDOUT_PIN_Pos) |
                      (I2S_PSEL_SDOUT_CONNECT_Connected <<
                           I2S_PSEL_SDOUT_CONNECT_Pos);

// SDIN routed on pin 4
NRF_I2S->PSEL.SDIN = (4 << I2S_PSEL_SDIN_PIN_Pos) |
                      (I2S_PSEL_SDIN_CONNECT_Connected <<
                           I2S_PSEL_SDIN_CONNECT_Pos);

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