

## TVP5154A Indirect Registers

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### 1 Procedure for Accessing TVP5154A Indirect Registers

The TVP5154A data sheet ([SLES214](#)) describes I<sup>2</sup>C/PHI registers 00–FF, which are the normal way of controlling and reading the state of the device. The TVP5154A data sheet also describes other registers inside the TVP5154A, such as the scaling control registers, which are known as indirect registers. These indirect registers require a four-step I<sup>2</sup>C transaction to read from or write to the register. There are other indirect registers inside the TVP5154A that are undocumented in the data sheet, but which the user may desire access to for certain applications. Information about these hidden indirect registers is proprietary, but may be released by TI as required.

The TVP5154A indirect registers may be written to or read by an indirect method using four reserved I<sup>2</sup>C/PHI registers at addresses 0x21–0x24. Indirect registers are divided into four banks, based on function or physical location in the TVP5154A. The address used to access these registers is the eight least-significant bits (LSBs) of the physical address. Each indirect register transaction reads or writes 16 bits of data, although the actual register may contain fewer defined bits. The procedures for writing to and reading from indirect registers are detailed in the following sections. To write to an indirect register, the TVP5154A must first be unlocked, as shown in [Section 1.4](#).

It is also important to correctly use the decoder write enable (0xFE) and the decoder read enable (0xFF) registers. Before an I<sup>2</sup>C write operation, the desired decoder select bits should be set in register 0xFE, and register 0xFF should not be written to. For an I<sup>2</sup>C read, the desired decoder should be selected by setting the appropriate bit in register 0xFF and register 0xFE should not be written to. This is because when register 0xFE is loaded, register 0xFF is set to 0x00, and when register 0xFF is loaded, register 0xFE is set to 0x00.

For indirect register access, it is necessary to select the desired decoder with a write to register 0xFE before both writing and reading any indirect register, and it is necessary to program register 0xFF between the two writes and two reads when reading any indirect register. So, for an indirect register read, this procedure should be followed:

1. Write to register 0xFE to write enable the desired decoder(s).
2. Write the address and read strobe to registers 0x23 and 0x24.
3. Write to register 0xFF to read enable the desired decoder.
4. Read the register data from registers 0x21 and 0x22.

#### 1.1 To Write to Indirect Registers

1. Write MSBs of data to I<sup>2</sup>C/PHI register 0x21.
2. Write LSBs of data to I<sup>2</sup>C/PHI register 0x22.
3. Write indirect register address (eight LSBs) to I<sup>2</sup>C/PHI register 0x23.
4. Write the write strobe (varies, depending on bank) to I<sup>2</sup>C/PHI register 0x24.

## 1.2 To Read from Indirect Registers

1. Write indirect register address (eight LSBs) to I<sup>2</sup>C/PHI register 0x23.
2. Write the read strobe (varies, depending on bank) to I<sup>2</sup>C/PHI register 0x24.
3. Read MSBs of data from I<sup>2</sup>C/PHI register 0x21.
4. Read LSBs of data from I<sup>2</sup>C/PHI register 0x22.

**Table 1. Register Banks with Read/Write Strobe Values**

REGISTER BANK	DESCRIPTION	READ STROBE	WRITE STROBE
R0–R127	General-purpose registers	01	02
0x200–0x2FF	Data memory	03	04
0x300–0x3FF	Digital die registers	05	06
AFE 0–9	Analog die registers	07	08

### 1.3 Example 1: Read from Indirect Register

Read value from decoder 1 for DID control, digital die register address 0x36A.

1. Write 0x01 to I<sup>2</sup>C/PHI register 0xFE to write enable decoder 1.
2. Write 0x6A to I<sup>2</sup>C/PHI register 0x23.
3. Write 0x05 to I<sup>2</sup>C/PHI register 0x24.
4. Write 0x01 to I<sup>2</sup>C/PHI register 0xFF to read enable decoder 1.
5. Read MSBs of 16-bit DID control from I<sup>2</sup>C/PHI register 0x21.
6. Read LSBs of 16-bit DID control from I<sup>2</sup>C/PHI register 0x22.

### 1.4 Example 2: Write to Indirect Register

Write new value for DID control, register 0x36A, to decoders 1, 2, and 3.

Write enable decoders 1, 2, and 3:

1. Write 0x07 to I<sup>2</sup>C/PHI register 0xFE.

Unlock TVP5154A password to enable indirect register write:

1. Write 0x51 to I<sup>2</sup>C/PHI register 0x21.
2. Write 0x54 to I<sup>2</sup>C/PHI register 0x22.
3. Write 0xFF to I<sup>2</sup>C/PHI register 0x23.
4. Write 0x04 to I<sup>2</sup>C/PHI register 0x24.

Write new value to DID control register:

1. Write MSBs of new 16-bit DID control to I<sup>2</sup>C/PHI register 0x21.
2. Write LSBs of new 16-bit DID control to I<sup>2</sup>C/PHI register 0x22.
3. Write 0x6A to I<sup>2</sup>C/PHI register 0x23.
4. Write 0x06 to I<sup>2</sup>C/PHI register 0x24.

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