

8.5.6 Single-ended mode

In single-ended mode, VIN- is derived from the reference ladder.

Before enabling the comparator via the **ENABLE** register, the following registers must be configured for the single-ended mode:

- **PSEL**
- **MODE**
- **REFSEL**
- **EXTREFSEL**
- **TH**

The reference ladder uses the reference voltage (VREF) to derive two new voltage references, VUP and VDOWN. VUP and VDOWN are configured using THUP and THDOWN respectively in the **TH** register. VREF can be derived from any of the available reference sources, configured using the **EXTREFSEL** and **REFSEL** registers as illustrated in [Comparator in single-ended mode](#) on page 251. When AREF is selected in the **REFSEL** register, the **EXTREFSEL** register is used to select one of the AIN0-AIN7 analog input pins as reference input. The selected analog pins will be acquired by the comparator once it is enabled.

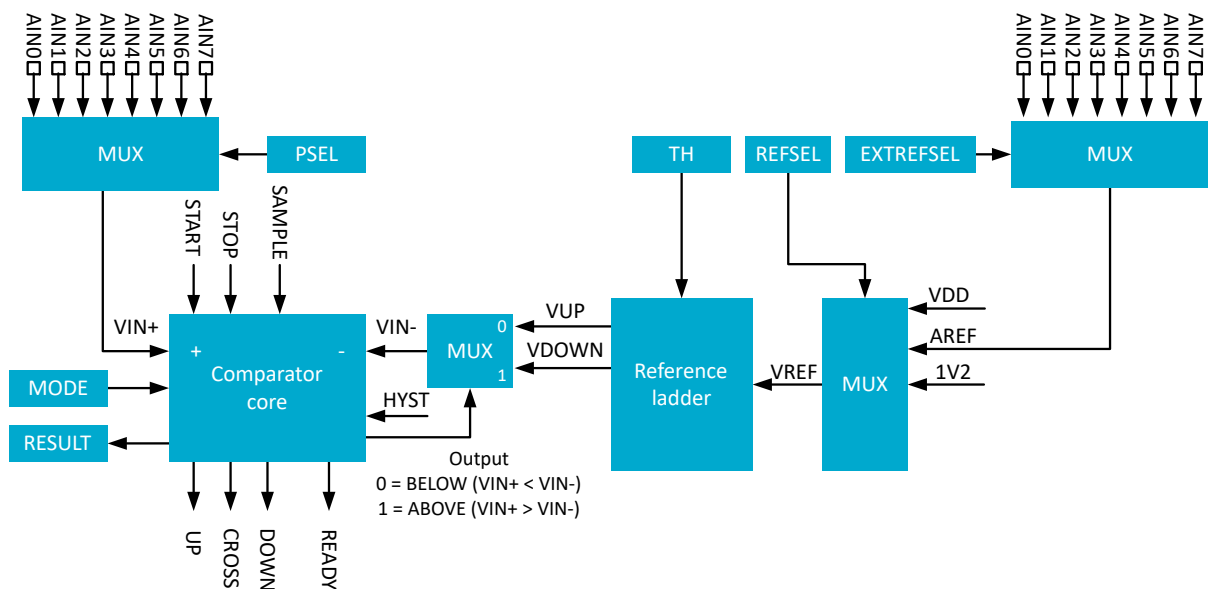


Figure 54: Comparator in single-ended mode

Note: Depending on the device, not all the analog inputs may be available for each MUX. See definitions for **PSEL** and **EXTREFSEL** for more information about which analog pins are available on a particular device.

When the comparator core detects that $VIN+ > VIN-$, i.e. ABOVE as per the **RESULT** register, **VIN-** will switch to **VDOWN**. When **VIN+** falls below **VIN-** again, **VIN-** will be switched back to **VUP**. By specifying **VUP** larger than **VDOWN**, a hysteresis can be generated as illustrated in [Hysteresis example where VIN+ starts below VUP](#) on page 252 and [Hysteresis example where VIN+ starts above VUP](#) on page 252.

Writing to **HYST** has no effect in single-ended mode, and the content of this register is ignored.