

## XC Implementation-Defined Behavior

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A conforming XC implementation is required to document its choice of behavior for all parts of the language specification that are designated implementation-defined. In the following section, all choices that depend on an externally determined application binary interface are listed as “determined by ABI,” and are documented in the Application Binary Interface Specification (see [XM-000967-PC](#)).

▶ **The value of a multi-character constant (§1.5.2).**

The value of a multi-character constant is the same as the value of its first character; all other characters are ignored.

▶ **Whether identical string literals are distinct (§1.6).**

Identical string literals are not distinct; they are implemented in a single location in memory.

▶ **The available range of values that may be stored into a `char` and whether the value is signed (§3.2).**

The size of `char` is 8 bits. Whether values stored in a `char` variable are signed or not is determined by the ABI.

▶ **The number of pins interfaced to a port and used for communicating with the environment; and the value of a port or clock not declared `extern` and not explicitly initialized (§3.2, §7.7).**

The number of pins connected to a port for communicating with the environment is defined either by the explicit initializer for its declarator. If no initializer is provided, the compiler produces an error message.

▶ **The notional transfer type of a port, the notional counter type of a port, and the notional counter type of a timer (§3.2).**

The notional types are determined by the ABI.

▶ **The value of an integer converted to a signed type such that its value cannot be represented in the new type (§5.2).**

When any integer is converted to a signed type and its value cannot be represented in the new type, its value is truncated to the width of the new type and sign extended.

▶ **The handing of overflow, divide check, and other exceptions in expression evaluation (§6).**

All conditions (divide by zero, mod zero and overflow of signed divide / mod) result in undefined behaviour.

▶ **The notion of alignment (§6.3.4).**

An alignment of  $2^n$  guarantees that the least significant  $n$  bits of the address in memory are 0. The specific alignment of the types is determined by the ABI.

- ▶ **The value and the type of the result of `sizeof` (§6.4.6).**

The value of the result of the `sizeof` operator is determined by the ABI. The type of the result is `unsigned int`.
- ▶ **Attempted run-time division by zero (§6.6).**

Attempted run-time division by zero results in a trap.
- ▶ **The extent to which suggestions made by using the `inline` function specifier are effective (§7.3).**

The `inline` function specifier is taken as a hint to inline the function. The compiler tries to inline the function at all optimization levels above `-O0`.
- ▶ **The extent to which suggestions made by using the `register` storage class specifier are effective (§7.7.4).**

The `register` storage class specifier causes the register allocator to try and place the variable in a register within the function. However, the allocator is not guaranteed to place it in a register.
- ▶ **The supported predicate functions for input operations (§8.3).**

The set of supported predicate functions is documented in [XM-000969-PC](#).
- ▶ **The meaning of inputs and outputs on ports (§8.3.2).**

The inputs and outputs on ports map to in and out instructions on port resources, the behaviour of which is defined in the XSI Ports Specification (see [X1373](#)).
- ▶ **The extent to which the underlying communication protocols are optimized for transaction communications (§8.9).**

The communication protocols are determined by the ABI.
- ▶ **Whether a transaction is invalidated if a communication occurs such that the number of bytes output is unequal to the number of byte input, and the value communicated (§11).**

This is determined by the ABI.
- ▶ **The behavior of an invalid operation (§12).**

Except as described below, all invalid operations are either reported as compilation errors or cause a trap at run-time.

  - ▶ The behavior of an invalid master transaction statement is undefined; an invalid slave transaction always traps.
  - ▶ The `unsafe` pragma (see [XM-000959-PC](#)) can be used to disable specific safety checks, resulting in undefined behavior for invalid operations.



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