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Subject: **Termination Sensing Proposal**

1. Abstract

A user in front of his computer equipped with an external SCSI connector and having no external SCSI devices is facing the classical dilemma "to terminate or not to terminate". This proposal attempts to shift the decision burden from the potentially frustrated user to his computer.

2. The Problem

It is not uncommon for a computer system to have a SCSI bus which connects together internal and external devices. The majority of the users are expected to utilize the basic system containing internal devices only. When the length of the internal bus becomes larger than 6 inches the bus has to be double terminated internally. Such systems intended for the consumer market will therefore be delivered with two internal terminations for the SCSI bus (e.g. figure 1, page 1).
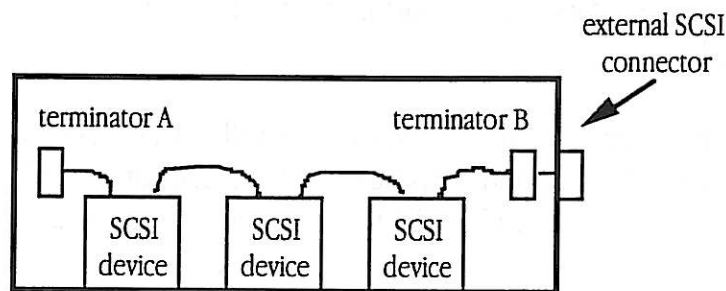

figure 1

The problem arises when a user attempts to connect an external SCSI devices to such a bus which is already double terminated internally (see figure 2, page 2) . At this point the probability for error becomes very large. The average user will end-up with a triple terminated bus . The

concerned user will attempt to do the correct thing which may become a frustrating experience with endless trips between dealers, friends, help lines and manuals.
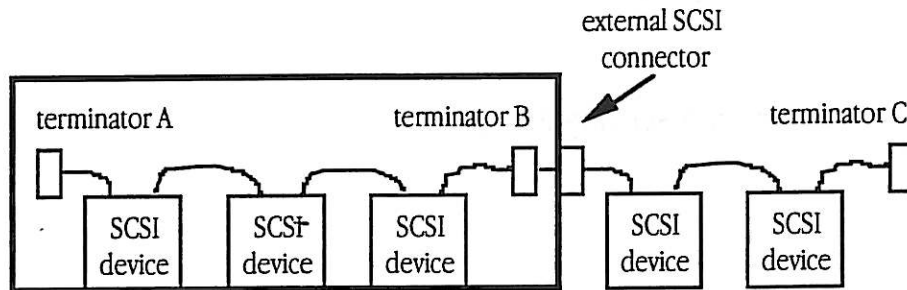

figure 2

3. The Solution

A simple solution to this problem is a termination sensing circuit controlling the second internal terminator (terminator B in figure 2, page 2). Initially, at power-up, the terminator B shall be disabled and the terminator sensing circuit shall detect the number and quality of the additional terminations connected to the bus. If necessary, the terminator B shall be activated.

4. The Implementation

A simple and reliable implementation of such a termination sensing circuit can test the available pull-up current to a standard SCSI signal driver during a bus reset phase and generate the appropriate decision..

During an active power-up reset the termination sensor will pull down one of the SCSI signal lines to less than 0.5 V (e.g. -RST) and measure the pull-up current available. If this current is less than 25 mA ±7% (23.25 mA to 26.75 mA) the terminator B shall be activated.

While the optimum implementation of this circuit can be achieved by integrating it with a controllable terminator, a discrete implementation concept is shown in figure 3, page 3.

The main caveat of the discrete implementation is the load capacitance added to the signal line. The use of -RST line for this purpose can minimize the significance of the problem. Also a con-

fusing situation can occur if such a termination sensing circuit is used in more than one place on the same bus and the power-on reset occurs simultaneous for the two devices.
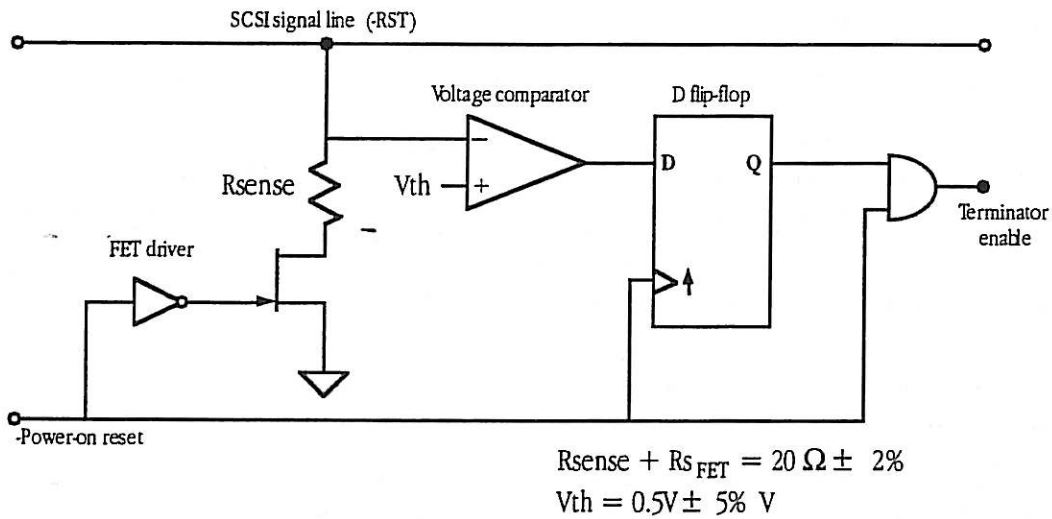

$$Rsense + Rs_{FET} = 20\,\Omega \pm 2\%$$
$$Vth = 0.5V \pm 5\%\ V$$

figure 3

5. Open Issues

Which SCSI signal line should be used ?.

The proposed line is -RST.

What value should we chose for the decision threshold ?

The proposed value is 25 mA $\pm$ 7%

Protocol issues ?

Multiple termination sensors on the same bus, multiple successive bus reset signals ...

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