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# ADC Proposal

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## Target Device Control Page

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# ADC Proposal

## Target Device Control Page

### Introduction

#### Background

At the July WG meeting, Paul Entzel of Quantum proposed a Tape Device Control mode page (see 02-253r1). This page provides a mechanism for an ADI initiator to configure the service delivery ports and logical units of an ADI target device.

#### Objectives

This proposal enhances the functionality proposed in 02-253r1. The enhancement allows the ADI initiator to configure the transceiver mode of operation and maximum transfer rate for parallel SCSI service delivery ports.

### Current Proposal

#### 2.2.4 Parallel SCSI Descriptor

The following table defines the fields in the SPI Descriptor:

Bit	7	6	5	4	3	2	1	0
Byte 4				Reserved				PE
5 – 6			Reserved					
7	SCSI Address							

The Port Enable (PE) bit is set to one to enable the port to respond to selections on the SCSI bus. When set to zero, the port will not respond to or attempt selections or reselections on the SCSI bus.

The SCSI Address field indicates the address that the port shall respond to on the SCSI bus. A device that receives a MODE SELECT command that attempts to change this value when the port is already enabled shall return Check Condition. The Sense Key shall be Illegal Request, and the additional sense code shall be Invalid Field in Parameter List. If the port is disabled, it shall not be an error to change the SCSI Address and enable the port with the same MODE SELECT command.

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## Change Concept

This proposal adds fields to the Tape Device Control page to configure and report:

1. The transceiver mode (e.g., HVD, LVD, SE).
2. The maximum transfer rate (e.g., Asynchronous, Fast-5, Fast-10, etc.) expressed as the minimum transfer period factor for full compatibility with SPI.

## Detailed Changes to Draft Technical Standard

### 2.2.4 Parallel SCSI Descriptor

The following table defines the fields in the SPI Descriptor:

Bit	7	6	5	4	3	2	1	0
Byte								
4	Reserved			TMC		Transceiver Mode		PE
5	Reserved							
6	Minimum Transfer Period Factor							
7	SCSI Address							

The Port Enable (PE) bit is set to one to enable the port to respond to selections on the SCSI bus. When set to zero, the port will not respond to or attempt selections or reselections on the SCSI bus.

The Transceiver Mode field identifies the transmission mode that the target device shall use for this target port. Table 91 – Bus Mode of the SCSI Parallel Interface 4 standard defines values for this field.

The Transceiver Mode Qualifier (TMQ) field qualifies the effect that the Transceiver Mode field has on the target port as listed in Table n.

Table n – Effect of Transceiver Mode Qualifier field

Value	Effect
00b	The target ignores the value of the Transceiver Mode field.
01b	The target operates the target port in the mode specified by the Transceiver Mode field; the target port does not drive the DIFFSENS line with the associated voltage and current characteristics. <sup>a</sup>
10b	Reserved
11b	The target operates the target port in the mode specified by the Transceiver Mode field; the target port drives the DIFFSENS line with the associated voltage and current characteristics. <sup>a</sup>
<sup>a</sup> – See SE/HVD transmission mode detection in SPI-4 for details regarding the DIFFSENS line.	

The Minimum Transfer Period Factor field identifies the minimum transfer period factor that the target shall use when negotiating transfer agreements for this target port. Table 5 – Transfer Period Factors of the SCSI Parallel Interface 4 standard defines values for this field. Devices that cannot support the identified minimum transfer period factor may enter negotiation using the next larger supported transfer period factor.

The SCSI Address field indicates the address that the port shall respond to on the SCSI bus.

A device receiving a MODE SELECT command for an enabled target port, where the command attempts to change the value of the Transceiver Mode, TMC, Minimum Transfer Period Factor, or SCSI Address fields, shall return Check Condition. The Sense Key shall be Illegal Request, and the additional sense code shall be Invalid Field in Parameter List. If the port is disabled, it shall not be an error to change the Transceiver Mode, TMC, Minimum Transfer Period Factor, or SCSI Address and enable the port with the same MODE SELECT command.

## Additional Information

The proposed changes references Tables 5 and 91 from SPI-4. I've copied them below for ease of reference.

Table 5 - Transfer Period Factor

Value	Description	Message	Transfer rate
00h - 07h	Reserved <sup>c</sup>	N/A	N/A
08h	Transfer period equals 6,25 ns.	PPR	Fast-160 <sup>a</sup>
09h	Transfer period equals 12,5 ns.	PPR	Fast-80 <sup>a</sup>
0Ah	Transfer period equals 25 ns	PPR, SDTR	Fast-40 <sup>b</sup>
0Bh	Transfer period equals 30,3 ns	PPR, SDTR	Fast-40 <sup>b</sup>
0Ch	Transfer period equals 50 ns	PPR, SDTR	Fast-20 <sup>b</sup>
0Dh - 18h	Transfer period equals the TRANSFER PERIOD FACTOR x 4	PPR, SDTR	Fast-20 <sup>b</sup>
19h - 31h	Transfer period equals the TRANSFER PERIOD FACTOR x 4	PPR, SDTR	Fast-10 <sup>b</sup>
32h – FFh	Transfer period equals the TRANSFER PERIOD FACTOR x 4	PPR, SDTR	Fast-5 <sup>b</sup>

<sup>a</sup> See table 43, table 44, and table 45. Table 42 does not apply because DT transfers are required for this transfer period factor.

<sup>b</sup> See table 42, table 43, table 44, and table 45.

<sup>c</sup> Faster transfer periods may be defined by future standards.

Table 91 - Bus mode

Code	Bus mode
00b	Unknown (e.g., device not capable of reporting bus mode)
01b	Single ended
10b	Low Voltage Differential
11b	High Voltage Differential