

February 1, 2012

Via EDGAR Submission and Overnight Delivery

Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

Attn: Pamela A. Long, Assistant Director

Re: Proto Labs, Inc.
Amendment No. 5 to Registration Statement on Form S-1
Filed: January 31, 2012
File No.: 333-175745

Ladies and Gentlemen:

Proto Labs, Inc., a Minnesota corporation (the "Company"), has today filed with the Securities and Exchange Commission, pursuant to the requirements of the Securities Act of 1933, as amended, an Amendment No. 5 to its Registration Statement on Form S-1 ("Amendment No. 4").

On behalf of the Company, we are writing to respond to the comments raised in the letters to the Company dated January 10, 2012 from the staff of the Securities and Exchange Commission (the "Staff"). The Company's responses below correspond to the captions and numbers of those comments (which are reproduced below in italics). For your convenience, copies of Amendment No. 5 are enclosed, and have been marked to show changes from Amendment No. 4 to the Registration Statement on Form S-1 filed on December 29, 2011. Where applicable, we have referenced in the Company's responses the appropriate page number of Amendment No. 5. Capitalized terms used in this letter, but not otherwise defined, have the meanings assigned to them in Amendment No. 5.

Results of Operations, page 37

1. *Based on your segment information on page F-23 we note material changes in segment income as a percentage of segment sales. Please amend your filing to explain the change in segment income as a percentage of segment sales period over period and quantify the underlying reasons driving the change. For example, we note segment income as a percentage of segment sales for your U.S. segment increased from 26% in 2009 to 32% in 2010 and 13% in 2009 to 20 % in 2010 for your Europe segment. Refer to Section 501.06a for guidance.*

Response: In response to the Staff's comment, the Company has revised page 44 of Amendment No. 5 to explain the change in segment income as a percentage of segment sales period over period and to quantify the underlying reasons driving the change.

Provision for Income Taxes, page 36

2. *Please amend your filing to explain to readers how the Japanese tax election created a tax deduction and how this election could impact future tax provisions (i.e. did the election enable you to deduct Japanese losses on your U.S. tax return whereas in prior years you were not allowed to take the election). Please also clarify whether you will be allowed to get a tax deduction for such Japanese losses in periods after 2010. If not, please amend your filing to explain the circumstances under which Japanese losses would not generate the same U.S. tax deduction similar to that in 2010.*

Response: In response to the Staff's comment, the Company has revised pages 36-37 of Amendment No. 5 to explain how the Japanese tax election created a tax deduction and how this election could impact future tax provisions.

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Finally, the Company will furnish a letter at the time it requests acceleration of the effective date of the Registration Statement acknowledging the statements set forth in the Staff's comment letter.

In connection with responding to your comments, we acknowledge that the Company is responsible for the adequacy and accuracy of the disclosure in the filing, that Staff comments or changes to disclosure in response to Staff comments do not foreclose the Commission from taking any action with respect to the filing, and that the Company may not assert Staff comments as a defense in any proceedings initiated by the Commission or any person under the federal securities laws of the United States.

We hope that the foregoing has been responsive to the Staff's comments. Should you have any questions relating to any of the foregoing, please feel free to contact the undersigned at (612) 766-7136.

Very truly yours,

/s/ W. Morgan Burns

W. Morgan Burns

Enclosure

cc: Bradley Cleveland
Proto Labs, Inc.
Kenneth Guernsey
Cooley LLP
Charles Kim
Cooley LLP