On-Line Transmission Control Set-Up at the GSI UNILAC

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Abstract

This document contains a series of plots proving that the set-up has been built, commissioned, and handed over to routine operation. It represents the supporting document for CARE deliverables 2007-39-HIPPI.

The system has been successfully installed and commissioned. Fig 1 shows the bloc diagram of the electronic system.

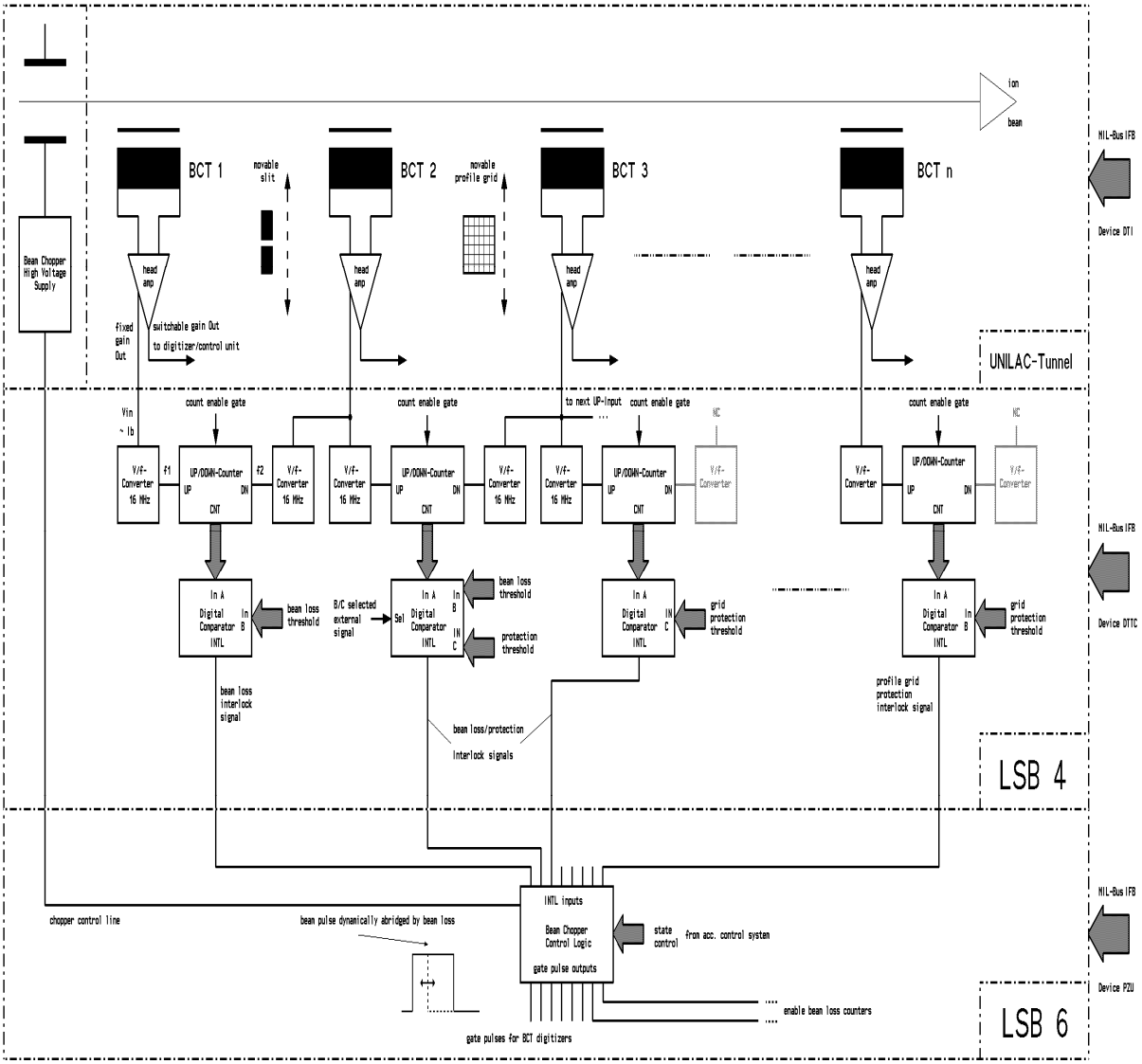

Fig.1: Block diagram of the on-line transmission control set-up.

The conceptual idea of the system is to shorten the pulse as soon as beam loss above a certain treshold is detected. Beam losses were imposed on purpose in order to test the set-up. Figure 2 shows the shortening of the pulse for various amounts of beam loss.

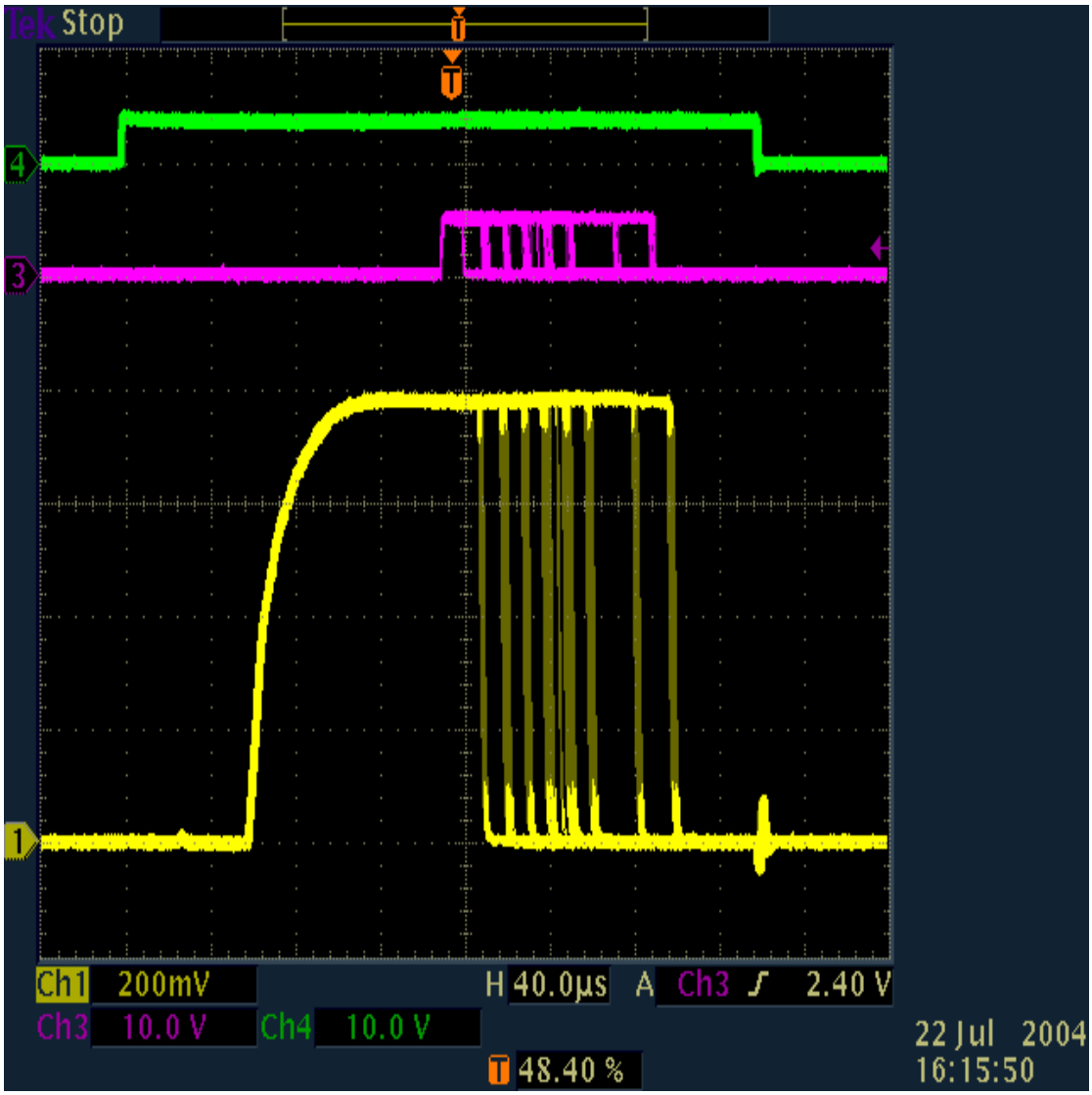

Fig. 2: yellow track: shortening of the beam pulse for various amounts of losses.

For a given pulse current and un-shortened pulse length (no losses) beam losses were provoked by varying a single quadrupole. Figure 3 shows the effect of the pulse shortening set-up. On the horizontal axis the running number of the measurement is plotted. Higher numbers correspond to higher beam losses. The green track gives the pulse current that is not affected by losses and/or pulse shortening since its dQ/dT. The blue curve shows the pulse length after shortening. The blue curve shows the charge remaining in the pulse after shortening.

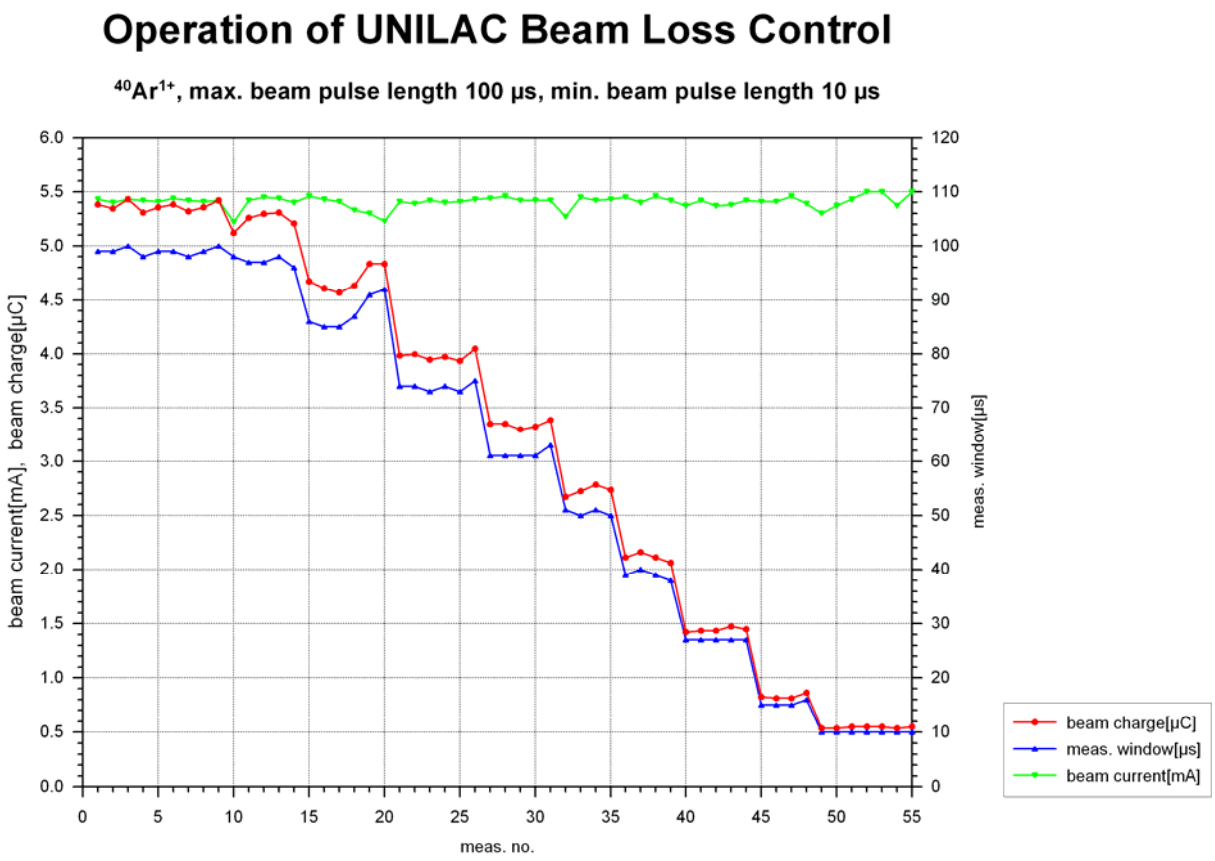

Fig. 3: Effect of beam loss and pulse shortening on the pulse current and pulse charge as function of the amount of losses.

Acknowledgements

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