Front-end Group - Task #19159

Edstrom request for IOTA magnet correction coordinator process.

02/27/2018 05:55 PM - Dennis Nicklaus

Status:	New	**Start date:**	02/27/2018
Priority:	Normal	**Due date:**	
Assignee:		**% Done:**	0%
Category:		**Estimated time:**	0.00 hour
Target version:			

Description

After talking with Sasha Romanov, we could definitely use an OAC to help coordinate changes to each of the four individual circuits for each of the 20 combined-function magnets in the IOTA ring. As I was describing, these will be set up through a front end that Mike Kucera is putting together for us, with each circuit being N:Inxxxc, where n is the circuit number (1-4), xxx is the location of the magnet around the ring (e.g. A1R, for the first magnet on the Right half of the injection girder, A), and C is the channel (e.g. V for voltage and I for current).

The OAC envisioned would have three parameters that drive combinations of the circuits for the desired effect: horizontal correction, vertical correction, or skew quadrupole. Each of these circuits can be driven at +/-2 Amps, so if one coil of the magnet is already at its limit, it will be up to the OAC to prevent tuning that would require it to regulate at any greater magnitude. The circuits are being laid out in a clockwise configuration so that the the upper left coil from the beam's perspective is coil 1, the upper right is coil 2, the lower right is coil 3, and the lower left is coil 4:

1 2

4 3

With this configuriation requires the following changes for the desired effect:

A vertical adjustment requires adjusting coils 1 & 2 opposite 3 & 4

A horizontal adjustment requires adjusting coils 1 & 4 opposite 2 & 3

A skew quad adjustment requires adjusting coils 1 & 3 opposite 2 & 4

Device names for these could simply replace the 'n' in the convention above (N:Inxxxc) with H (horz), V (vert), or K (skew quad). We'd only be using these to adjust the current so there's no need for the 'c' channel identifier, but we would like to scale the common device settings and readbacks to gauss (while the primary can probably be current, like the common scaling for the respective circuits). We have these conversions and can put them in the database as a last step.

Does this sound reasonable? If so I can get you a complete list of the combined function circuits that we'll need to control. If you have any other questions or legwork I can certainly try to help. The individual circuits aren't in the database yet, but I'd expect them to be going in in the next few weeks.

History

#1 - 02/28/2018 07:47 AM - Richard Neswold

Are these magnets being controlled by the networked power supplies I'm working on for Mike Kucera? If so, I would think high-level logic could be in my front-end rather than an OAC.

#2 - 02/28/2018 09:58 AM - Richard Neswold

Nevermind my previous comment. **Mike Kucera** informed me this is a different project.