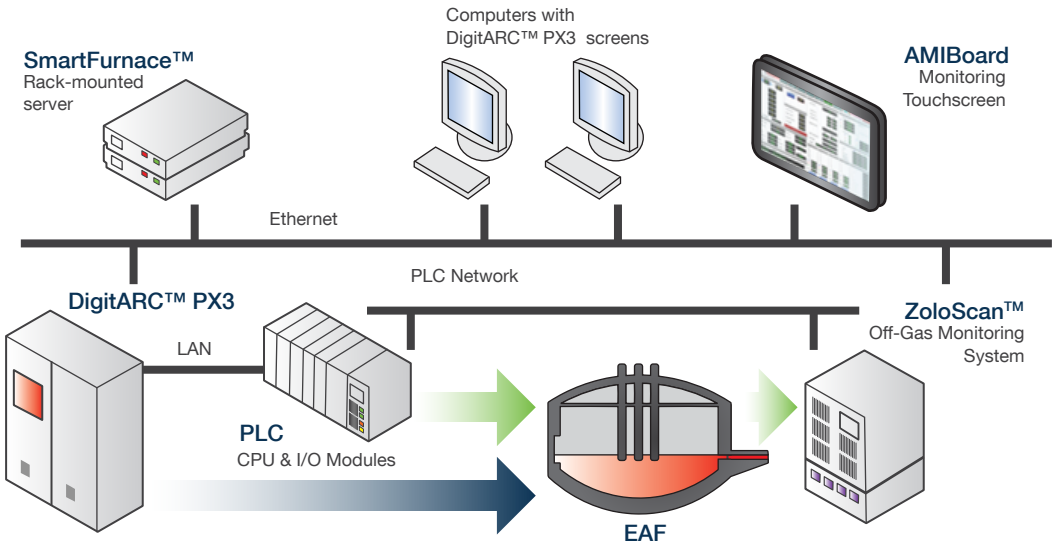
SmartARC™ Module

For the AMI SmartFurnace™ System

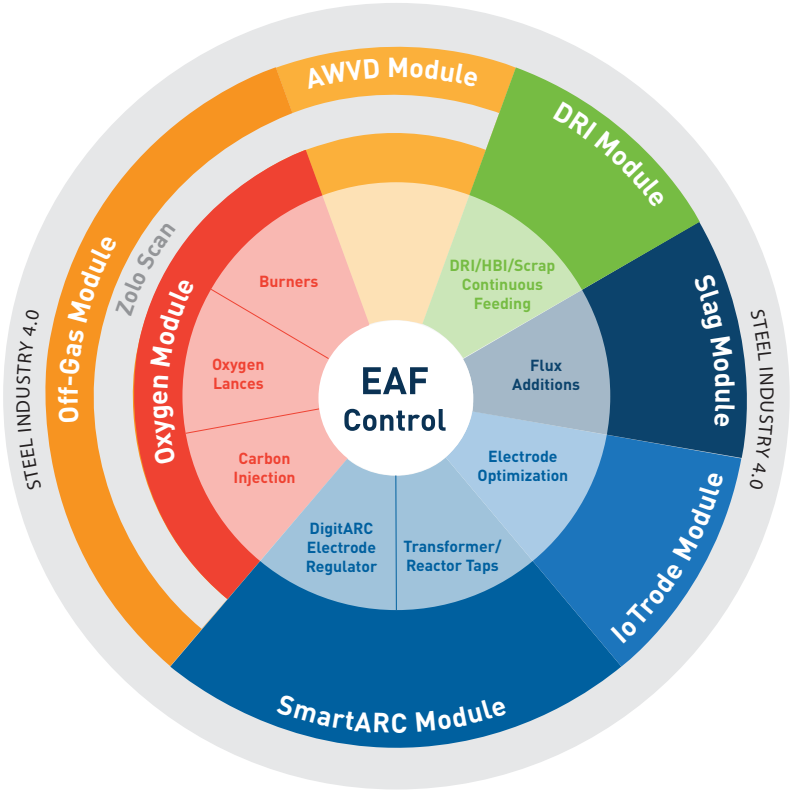
SmartARC™ Module

SmartARC™ is the foundation the AMI SmartFurnace™ solutions for all EAFs. SmartARC™ works in coordination with our proven DigitArc™ family of electrode regulators to enhance EAF performance by providing the necessary setpoints to optimize the complete electrical input of the EAF at all times. SmartARC™ is configured to each specific EAF in a user-friendly open operating system by the customer along with AMI's highly trained team of EAF Regulation Engineers to use the best operating points at all times for transformer tap, reactor tap, current and voltage, variable arc length, setpoint and regulation mode choice based on the heat stage, slag level, arc stability and scrap mix using advanced digital tools along with artificial intelligence.

The SmartFurnace™ System utilizes additional individual modules and sensors within the SmartARC™ operating system to adapt, optimize, and coordinate, every aspect of the EAF operation. AMI's user-friendly open architecture allows the user to customize the operation and enhance EAF performance to the exact needs of the customer.



AMI's SmartFurnace™ System utilizes several individual modules to adapt and optimize every aspect of the furnace operation. The open architecture allows EAF is operate with the best performance at all times according the specific needs of the customer.



SmartFurnace™ Modules

- **SmartARC™**
  Decides the best operating points based on the heat stage, slag level, arc stability and scrap mix for transformer and reactor tap reference.

- **IoTrode™**
  Measures, Controls, and Optimizes the consumption of graphite electrodes using advanced digital technologies and the tools of Industry 4.0.

- **Oxygen**
  Utilizes electrical data from the PX3 and SmartARC™ to become more than a burner control program. The SmartFurnace™ Oxygen Module controls the rates of gas, oxygen and carbon considering the conditions of the heat the composition of the bath and additional inputs to provide accurate end point prediction and control.

- **Slag Optimization**
  For carbon steel producers this SmartFurnace™ Module implements an online mass balance to model the slag composition and recommend and control flux additions to achieve the target basicity and MgO Saturation.

- **Off-Gas**
  The Off-Gas Module saves energy. The main goal is to optimize the chemical energy into the EAF. The EAF control system is capable of analyzing on real time the EAF off gas using the TDLAS technology with a laser beam.

- **AWVP (Abnormal Water Vapor Detection)**
  One of the most advanced SmartFurnace™ Modules AWVD utilizes *AI* and machine learning to compare the many normal sources of water in a furnace vs an abnormal water vapor condition.

- **DRI/HBI Feed**
  Optimize the time to start the DRI/HBI feeding and control the steel temperature using advanced metallurgical modeling to avoid accumulation of un-melted material in the furnace.