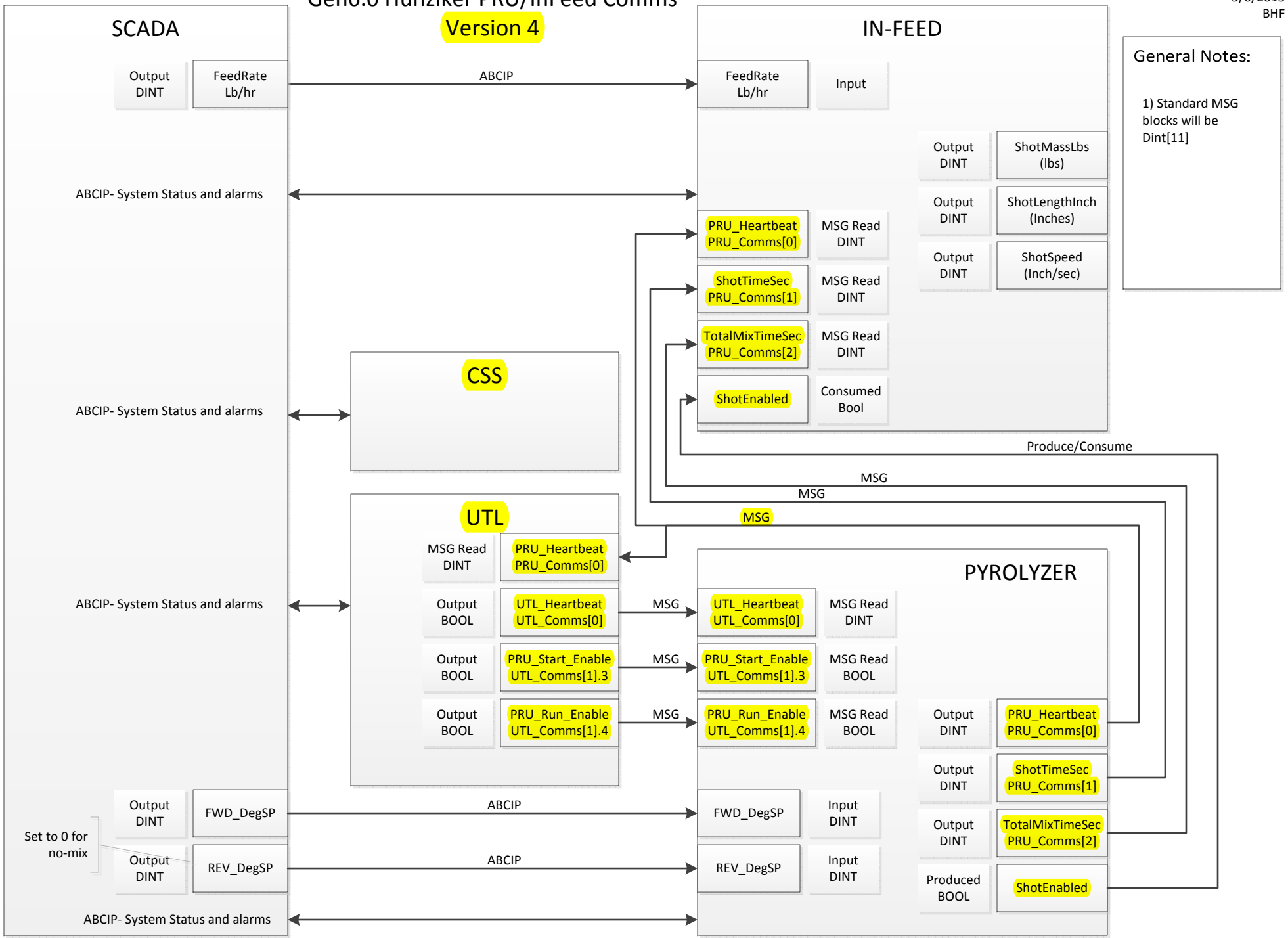
Gen6.0 Hunziker PRU/InFeed Comms

Version 4

3/6/2013
BHF



General Notes:

1) Standard MSG blocks will be Dint[11]

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Definition of Terms:

1) Tag Source
   - Input = Input variable (derived by internal process)
   - Output = Output variable (derived by outside process)

2) Tag Types:
   - BOOLEAN = Single bit (On/Off condition)
   - DINT = 32-bit integer, no decimal allowed

3) Communication Types:
   - ABCIP = Ethernet comms from SCADA to Allen Bradley Logix5000 processors
   - MSG = Ethernet comms PLC-to-PLC
   - Produce/Consume = Ethernet comms, unique to Allen Bradley Logix5000 procedure

4) Tag Naming Standards
   - CamelCase = keeps variable names short but readable
   - Use of Underscores = use when connecting two words with preceding capital letters

4) Process Variables
   - FeedRate = User set-point to define the total mass of raw materials through the system (units of pounds/hour)
   - FWD_DegSP = User set-point to define the number of forward rotations of the pyrolyzer screws (units of degrees)
   - REV_DegSP = User set-point to define the number of reverse rotations of the pyrolyzer screws (units of degrees)
     - the standard values should be between 150^{o} and 180^{o}.
     - to define a “no mix” function, set REV_DegSP = 0^{o}
   - UTL_Heartbeat = This is the UTL PLC heartbeat signal represented by a clock tick (if the value does not change at the remote PLC, there is a communications fault)
   - PRU_Start_Enable = This is the master START ENABLE from the UTL panel that enables the PRU to start (representing Fault #_____)
     - this bit must be true to transition from a “cold” state to a “running” state
   - PRU_Run_Enable = This is the master RUN ENABLE from the UTL panel that enables the PRU to continue processing (representing Fault #_____)
     - this bit must be true to enable the forward transition of material and addition of new raw materials
     - (synonymous with “ECOOL” or “PRU_RUN_DISABLE”)
   - PRU_Heartbeat = This is the PRU (Pyrolyzer) PLC heartbeat signal represented by a clock tick (if the value does not change at the remote PLC, there is a communications fault)
   - ShotTimeSec = PRU-calculated variable defining the timeslice for each shot (units of seconds).
     - This is a function of: FWD_DegSP, REV_DegSP, VFD Speed, Gearbox Ratio
     - with REV_DegSP = 0 defines a no-mix condition, essentially making the ShotTimeSec approach infinity.
     - ShotTimeSec max should be 999999
   - TotalMixTimeSec = PRU-calculated variable defining the total mix cycle time (units of seconds)
     - This is a function of: FWD_DegSP, REV_DegSP, VFD Speed, Accel Time, Decel Time, Gearbox Ratio
     - with REV_DegSP = 0 defines a no-mix condition, essentially making the TotalMixTimeSec approach infinity.
     - TotalMixTimeSec max should be 999999
   - ShotEnabled = on/off conditions that tells the InFeed systems when feed process is allowed. To maximize the feed timing, this tag will utilize produce/consume comms
   - ShotMassLbs = InFeed-calculated variable defining the pounds of raw material in each shot (units of pounds)
     - This is a function of: FeedRate and TotalMixTime
     - In a no-mix condition, the ShotMassLbs should be the maximum allowable mass per shot (based on the mechanical/instrumentation limitiations)
   - ShotLengthInch = This is an InFeed measured value (units of inches)
     - After the raw material is loaded and compressed, the shot plunger needs to measure the shot height at a pre-defined compression measurement
     - Possible measurements: hydraulic pressure or positioner deceleration
   - ShotSpeed = this is an InFeed calculated variable defining the velocity to add the compressed shot into the PRU
     - With mix-mode enabled, this is a function of ShotTimeSec and position of the linear actuator at the measured compression stroke.
     - in the case of the no-mix condition, the shot time will be defined by FeedRate and the average time to load a new shot