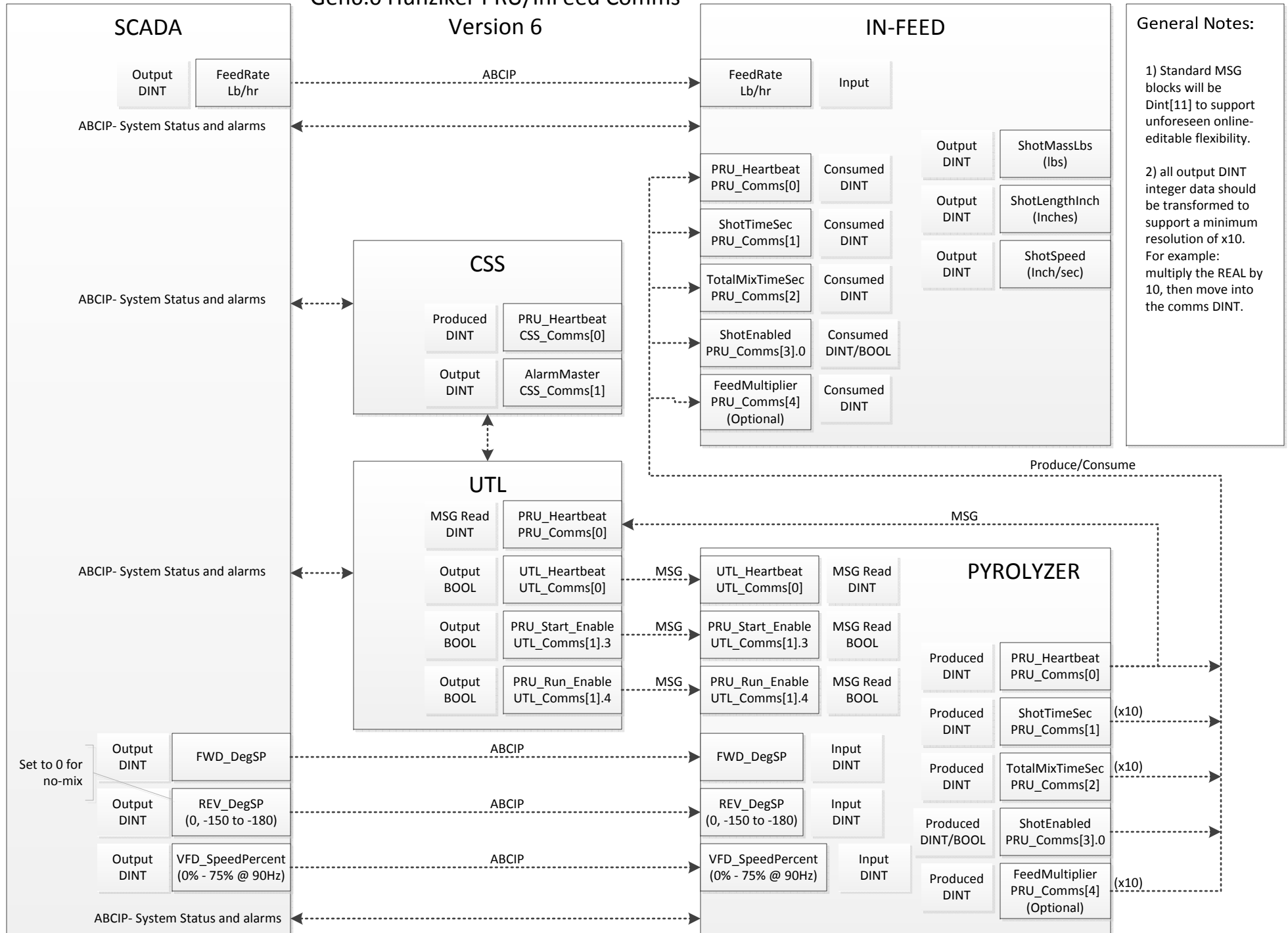


Gen6.0 Hunziker PRU/InFeed Comms Version 6



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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° and 180°.

- to define a "no mix" function, set REV_DegSP = 0°

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

FeedMultiplier = This is a linear relationship based on VFD speed % of max to be used to reduce effective FeedRate used in the InFEED calculations

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 limitations)

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

VFD_SpeedPercent = this setpoint commands the screw speed (0% – 75%)