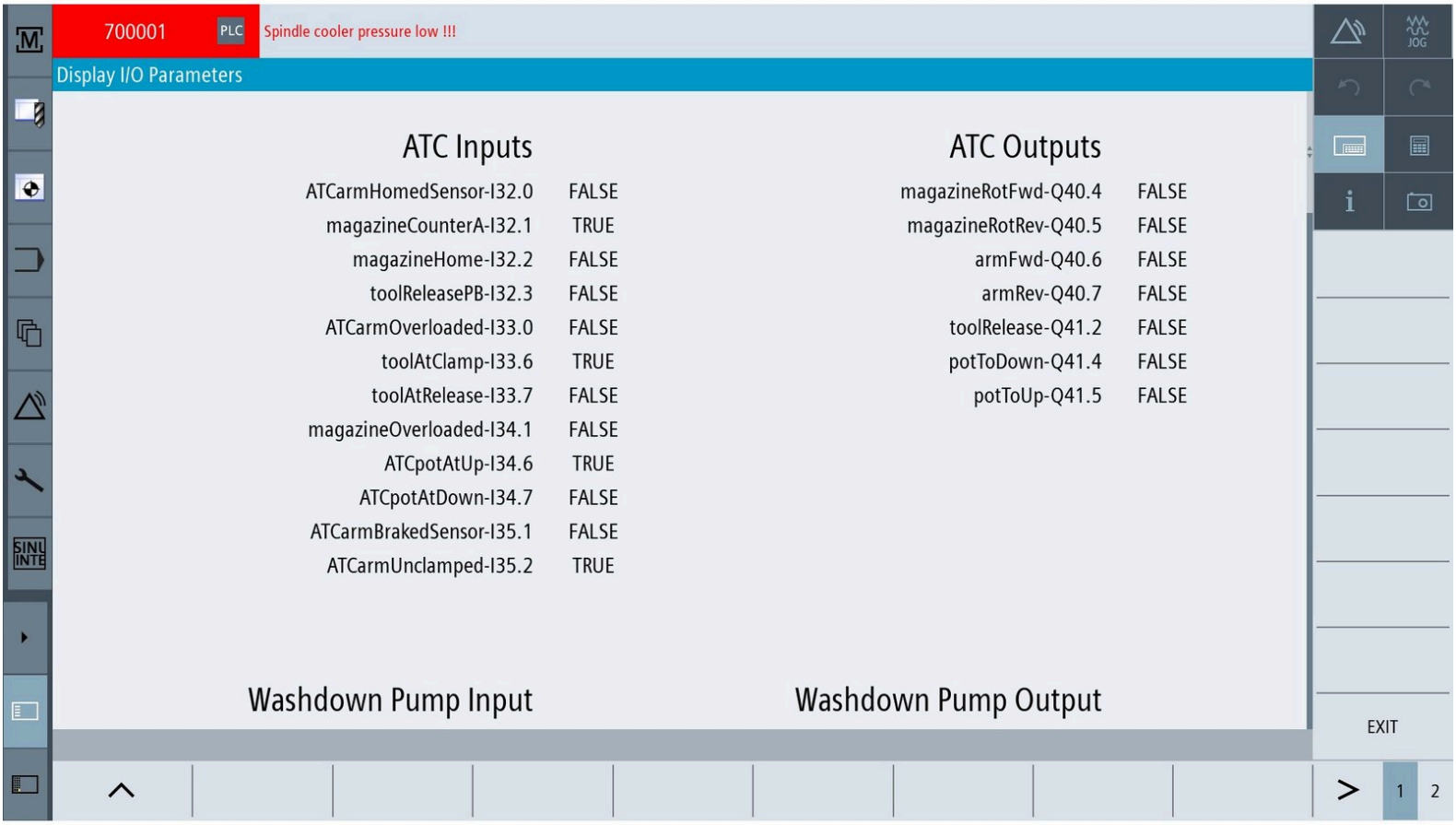
VMCsi - Diagnostic I/O Custom Screen

Use the TRAK Diagnostic I/O screen to check machine inputs and outputs on a VMCsi.

Written By: Pat Fitzsimmons



INTRODUCTION

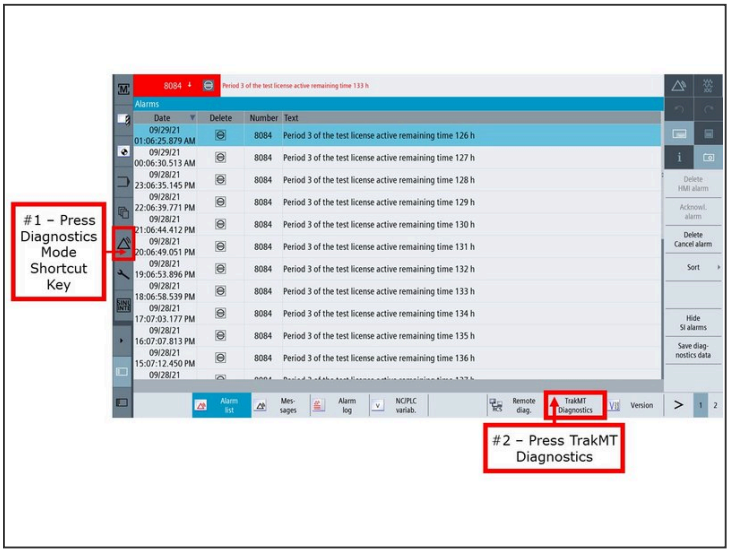
TRAK includes a Diagnostic I/O custom screen that monitors a wide range of data that is easily accessible on the pendant.

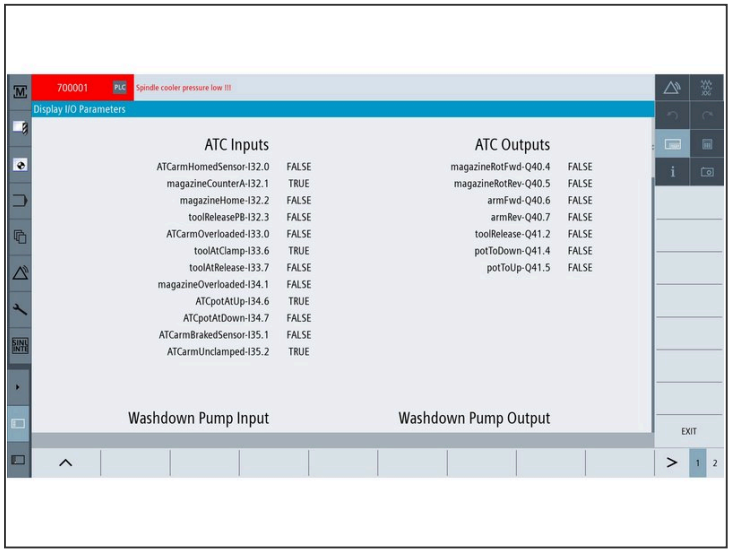
The screen is filled with flags that display “TRUE” or “FALSE”.

- “TRUE” means that the status of an I/O is "1," which means that the particular I/O function has a voltage charge.
- "FALSE" means that the status of an I/O is "0," which means that the particular I/O function has no voltage charge.

The TRUE and FALSE values of an I/O designate a specific behavior for a function on the machine, and if these behaviors do not act in accordance to their assigned values, it means that there is an issue with the machine that needs to be addressed.

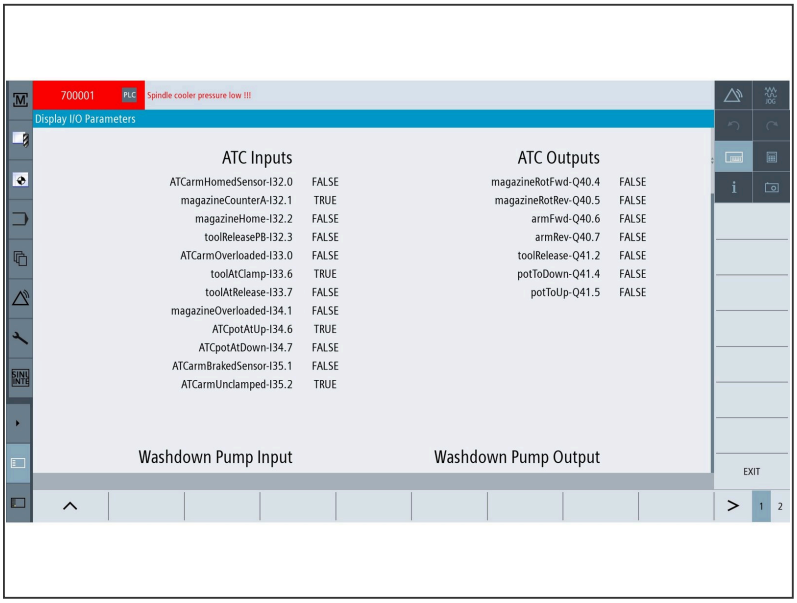
Step 1 — Access the Display I/O Signals Window





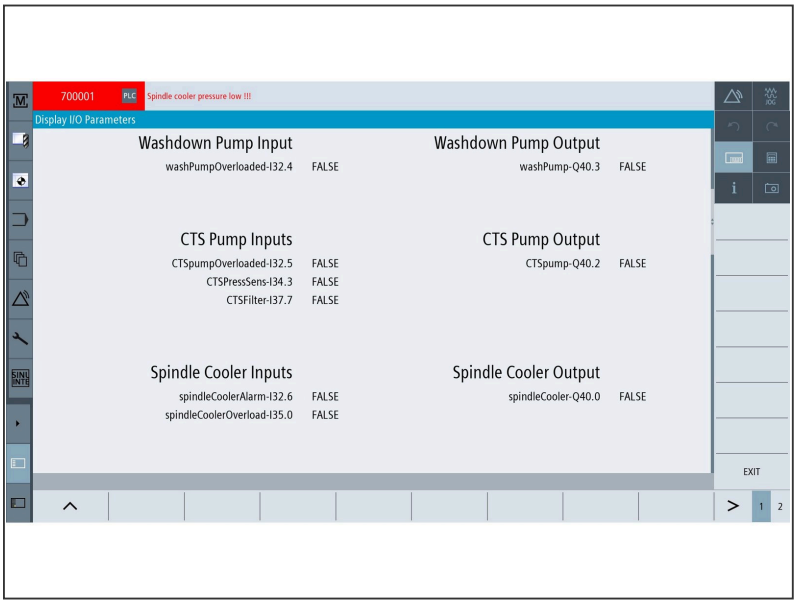
- To access the list of Input and Output parameters for your TRAK machine, (1) press the Diagnostics Mode shortcut key on the left-hand side of the screen, and then (2) press the Horizontal Soft Key (HSK) "TrakMT Diagnostics."
- The "Display I/O Signals" window appears. It lists various inputs and outputs.
- ATC I/O, Washdown Pump I/Os, CTS Pump I/O, Spindle Cooler I/Os, Coolant Pump I/Os, Chip Conveyor I/Os, Skimmer I/O, Lube Pump I/Os, Guard I/Os, Hand Held Unit (HHU) or EHW I/Os, Control and Status I/Os, Status and Work Light outputs.

Step 2 — Automatic Tool Changer (ATC) I/O



- The Diagnostic I/O Custom Screen includes a listing of Automatic Tool Changer (ATC) inputs and outputs as shown in the image.

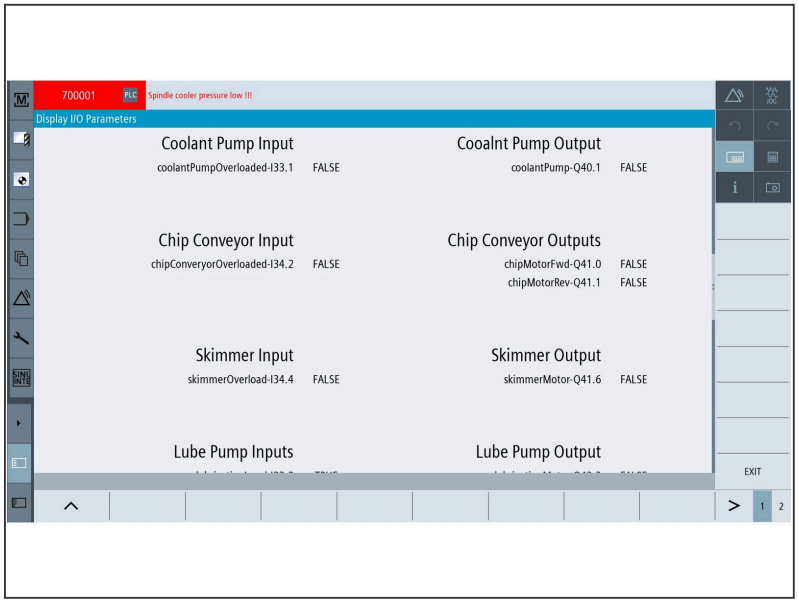
Step 3 — Washdown, CTS Pump and Spindle Cooler I/O



- The custom screen also provides a listing of washdown, CTS Pump and Spindle Cooler I/Os.

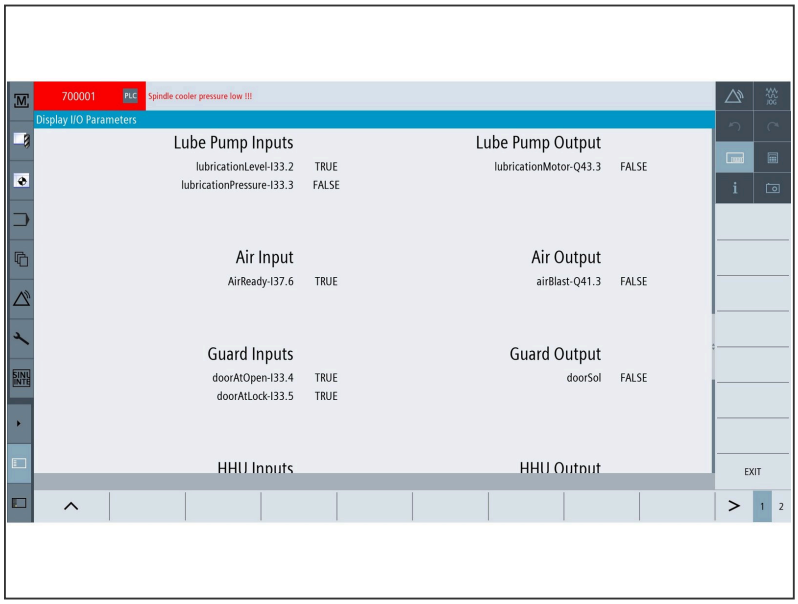
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Step 4 — Coolant Pump, Chip Conveyor, Skimmer I/Os



- The image on the left shows Coolant Pump, Chip Conveyor, and Skimmer I/Os

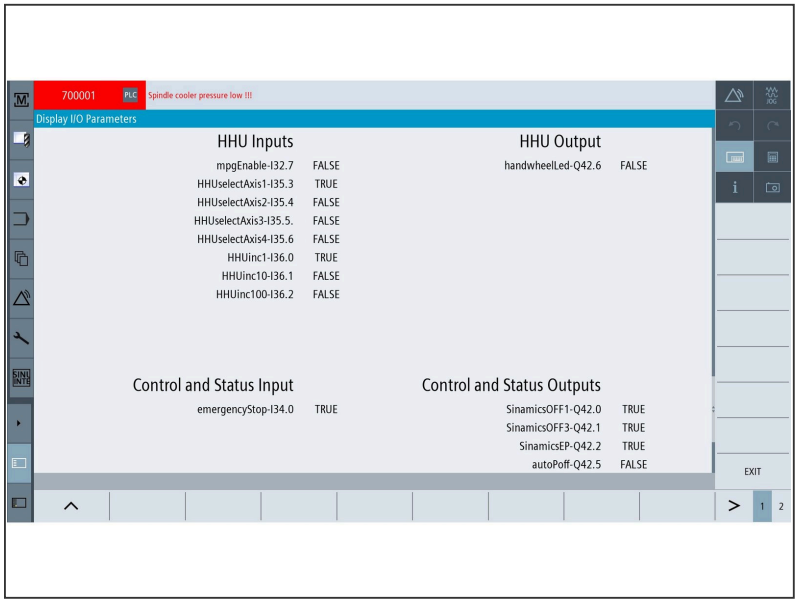
Step 5 — Lubrication, Air, Guard I/Os



- The screen on the left shows Lube Pump, Air, Guard I/Os

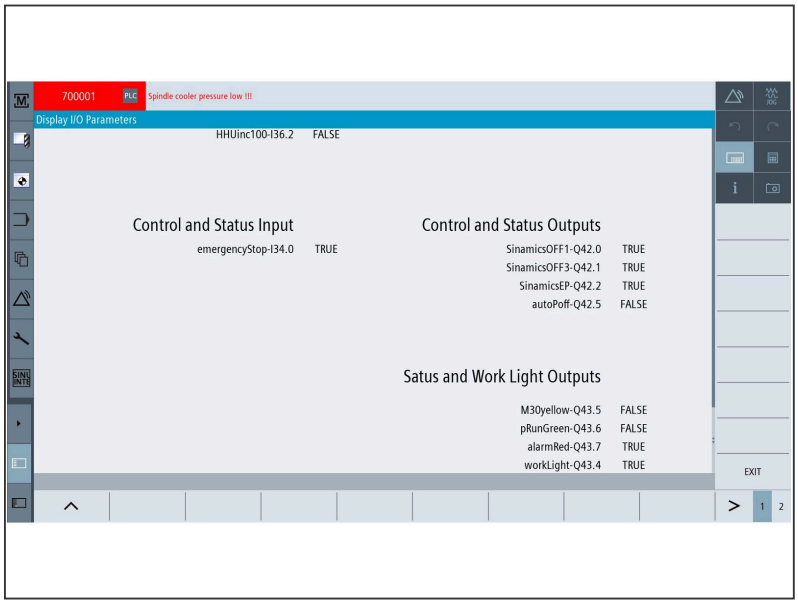
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Step 6 — Hand Held Unit, Control and Status I/Os



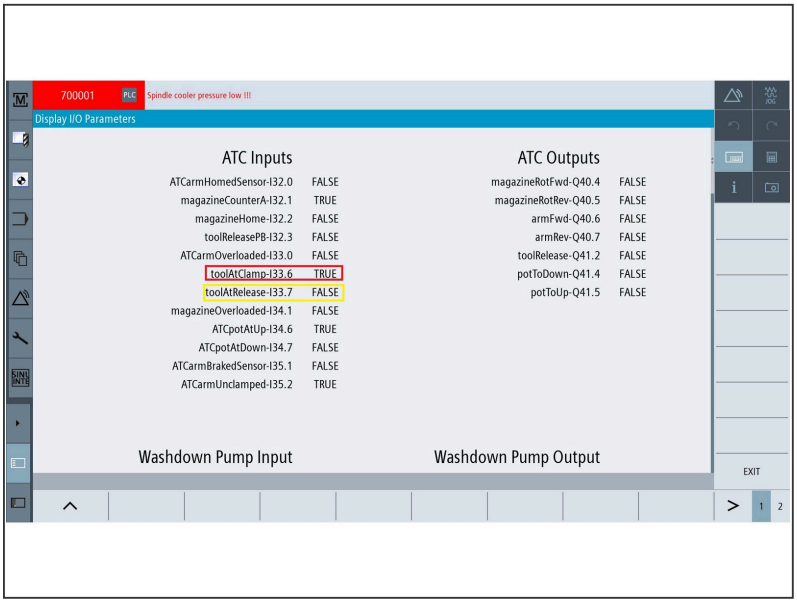
- The screen on the left shows Handheld Unit, Control and Status I/Os

Step 7 — Status and Work light outputs



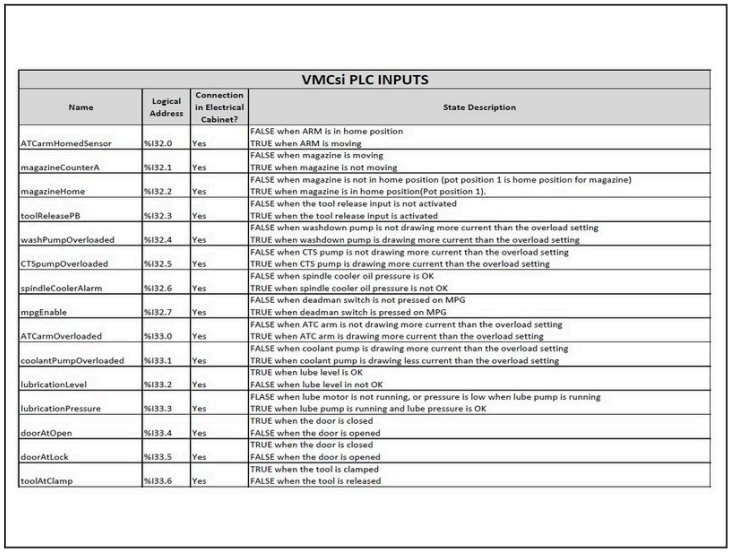
- The screen on the left shows Status and Work Light outputs

Step 8 — Examples of I/O Functionality



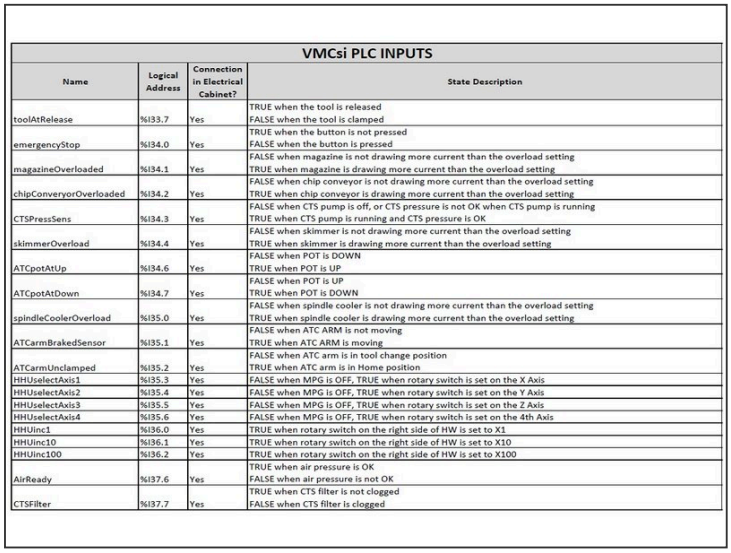
- Below are two (2) I/O examples with an explanation of their TRUE and FALSE values:
  - **toolAtClamp** is an ATC input that is connected to the Tool Clamp/Unclamp function in the spindle.
    - **TRUE** means the tool in the spindle is **clamped**. **FALSE** means the tool in the spindle is **released**.
  - Alternatively, **toolAtRelease** is the opposite ATC input of toolAtClamp.
    - **TRUE** means the tool in the spindle is **released**. **FALSE** means the tool in the spindle is **clamped**.
- If the machine's behavior is not in accordance with TRUE or FALSE values of a specific I/O, then there is an issue with the machine that needs to be addressed.

Step 9 — Input logic



VMCsi PLC INPUTS

Name	Logical Address	Connection in Electrical Cabinet?	State Description
ATCarmHomedSensor	%I32.0	Yes	FALSE when ARM is in home position TRUE when ARM is moving
magazineCounterA	%I32.1	Yes	FALSE when magazine is moving TRUE when magazine is not moving
magazineHome	%I32.2	Yes	FALSE when magazine is not in home position (pot position 1 is home position for magazine) TRUE when magazine is in home position(Pot position 1).
toolReleasePB	%I32.3	Yes	FALSE when the tool release input is not activated TRUE when the tool release input is activated
washPumpOverloaded	%I32.4	Yes	FALSE when washdown pump is not drawing more current than the overload setting TRUE when washdown pump is drawing more current than the overload setting
CTSpumpOverloaded	%I32.5	Yes	FALSE when CTS pump is not drawing more current than the overload setting TRUE when CTS pump is drawing more current than the overload setting
spindleCoolerAlarm	%I32.6	Yes	FALSE when spindle cooler oil pressure is OK TRUE when spindle cooler oil pressure is not OK
mpgEnable	%I32.7	Yes	FALSE when deadman switch is not pressed on MPG TRUE when deadman switch is pressed on MPG
ATCarmOverloaded	%I33.0	Yes	FALSE when ATC arm is not drawing more current than the overload setting TRUE when ATC arm is drawing more current than the overload setting
coolantPumpOverloaded	%I33.1	Yes	FALSE when coolant pump is drawing more current than the overload setting TRUE when coolant pump is drawing less current than the overload setting
lubricationLevel	%I33.2	Yes	TRUE when lube level is OK FALSE when lube level in not OK
lubricationPressure	%I33.3	Yes	FLASE when lube motor is not running, or pressure is low when lube pump is running TRUE when lube pump is running and lube pressure is OK
doorAtOpen	%I33.4	Yes	TRUE when the door is closed FALSE when the door is opened
doorAtLock	%I33.5	Yes	TRUE when the door is closed FALSE when the door is opened
toolAtClamp	%I33.6	Yes	TRUE when the tool is clamped FALSE when the tool is released

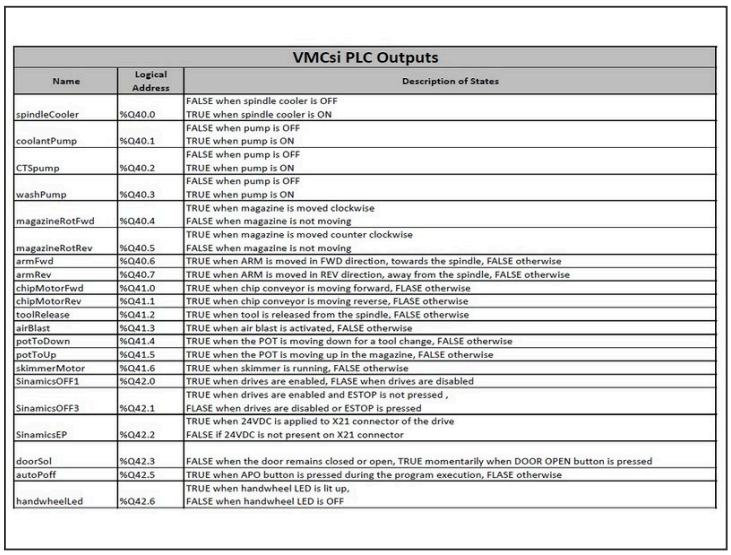


VMCsi PLC INPUTS

Name	Logical Address	Connection in Electrical Cabinet?	State Description
toolAtRelease	%I33.7	Yes	TRUE when the tool is released FALSE when the tool is clamped
emergencyStop	%I34.0	Yes	TRUE when the button is not pressed FALSE when the button is pressed
magazineOverloaded	%I34.1	Yes	FALSE when magazine is not drawing more current than the overload setting TRUE when magazine is drawing more current than the overload setting
chipConveryorOverloaded	%I34.2	Yes	FALSE when chip conveyor is not drawing more current than the overload setting TRUE when chip conveyor is drawing more current than the overload setting
CTSPressSens	%I34.3	Yes	FALSE when CTS pump is off, or CTS pressure is not OK when CTS pump is running TRUE when CTS pump is running and CTS pressure is OK
skimmerOverload	%I34.4	Yes	FALSE when skimmer is not drawing more current than the overload setting TRUE when skimmer is drawing more current than the overload setting
ATCpotAtUp	%I34.6	Yes	FALSE when POT is DOWN TRUE when POT is UP
ATCpotAtDown	%I34.7	Yes	FALSE when POT is UP TRUE when POT is DOWN
spindleCoolerOverload	%I35.0	Yes	FALSE when spindle cooler is not drawing more current than the overload setting TRUE when spindle cooler is drawing more current than the overload setting
ATCarmBrakedSensor	%I35.1	Yes	FALSE when ATC ARM is not moving TRUE when ATC ARM is moving
ATCarmUnclamped	%I35.2	Yes	FALSE when ATC arm is in tool change position TRUE when ATC arm is in Home position
HHUselectAxis1	%I35.3	Yes	FALSE when MPG is OFF, TRUE when rotary switch is set on the X Axis
HHUselectAxis2	%I35.4	Yes	FALSE when MPG is OFF, TRUE when rotary switch is set on the Y Axis
HHUselectAxis3	%I35.5	Yes	FALSE when MPG is OFF, TRUE when rotary switch is set on the Z Axis
HHUselectAxis4	%I35.6	Yes	FALSE when MPG is OFF, TRUE when rotary switch is set on the 4th Axis
HHUinc1	%I36.0	Yes	TRUE when rotary switch on the right side of HW is set to X1
HHUinc10	%I36.1	Yes	TRUE when rotary switch on the right side of HW is set to X10
HHUinc100	%I36.2	Yes	TRUE when rotary switch on the right side of HW is set to X100
AirReady	%I37.6	Yes	TRUE when air pressure is OK FALSE when air pressure is not OK
CTSFilter	%I37.7	Yes	TRUE when CTS filter is not clogged FALSE when CTS filter is clogged

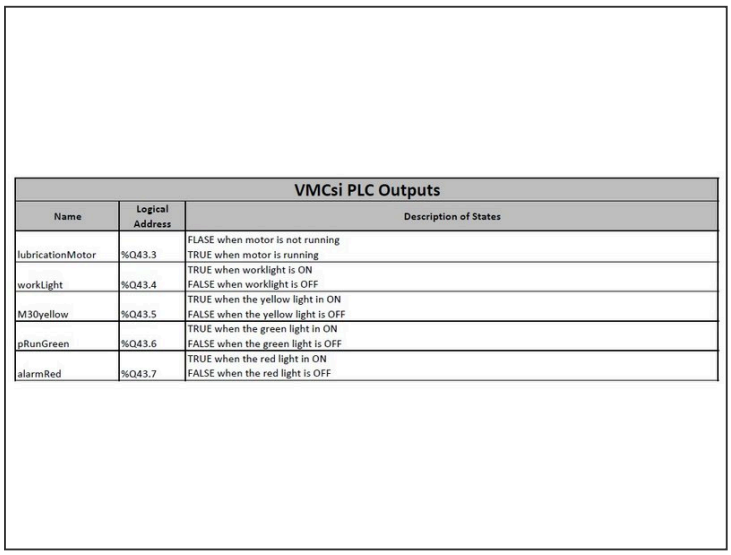
- All the input logic is explained in the tables on the left.

Step 10 — Output logic



VMCsi PLC Outputs

Name	Logical Address	Description of States
spindleCooler	%Q40.0	FALSE when spindle cooler is OFF TRUE when spindle cooler is ON
coolantPump	%Q40.1	FALSE when pump is OFF TRUE when pump is ON
CTSpump	%Q40.2	FALSE when pump is OFF TRUE when pump is ON
washPump	%Q40.3	FALSE when pump is OFF TRUE when pump is ON
magazineRotFwd	%Q40.4	TRUE when magazine is moved clockwise FALSE when magazine is not moving
magazineRotRev	%Q40.5	TRUE when magazine is moved counter clockwise FALSE when magazine is not moving
armFwd	%Q40.6	TRUE when ARM is moved in FWD direction, towards the spindle, FALSE otherwise
armRev	%Q40.7	TRUE when ARM is moved in REV direction, away from the spindle, FALSE otherwise
chipMotorFwd	%Q41.0	TRUE when chip conveyor is moving forward, FLASE otherwise
chipMotorRev	%Q41.1	TRUE when chip conveyor is moving reverse, FLASE otherwise
toolRelease	%Q41.2	TRUE when tool is released from the spindle, FALSE otherwise
airBlast	%Q41.3	TRUE when air blast is activated, FALSE otherwise
potToDown	%Q41.4	TRUE when the POT is moving down for a tool change, FALSE otherwise
potToUp	%Q41.5	TRUE when the POT is moving up in the magazine, FALSE otherwise
skimmerMotor	%Q41.6	TRUE when skimmer is running, FALSE otherwise
SinamicsOFF1	%Q42.0	TRUE when drives are enabled, FLASE when drives are disabled
SinamicsOFF3	%Q42.1	TRUE when drives are enabled and ESTOP is not pressed , FLASE when drives are disabled or ESTOP is pressed
SinamicsEP	%Q42.2	TRUE when 24VDC is applied to X21 connector of the drive FALSE if 24VDC is not present on X21 connector
doorSol	%Q42.3	FALSE when the door remains closed or open, TRUE momentarily when DOOR OPEN button is pressed
autoPoff	%Q42.5	TRUE when APO button is pressed during the program execution, FLASE otherwise
handwheelLed	%Q42.6	TRUE when handwheel LED is lit up, FALSE when handwheel LED is OFF



VMCsi PLC Outputs

Name	Logical Address	Description of States
lubricationMotor	%Q43.3	FLASE when motor is not running TRUE when motor is running
workLight	%Q43.4	TRUE when worklight is ON FALSE when worklight is OFF
M30yellow	%Q43.5	TRUE when the yellow light in ON FALSE when the yellow light is OFF
pRunGreen	%Q43.6	TRUE when the green light in ON FALSE when the green light is OFF
alarmRed	%Q43.7	TRUE when the red light in ON FALSE when the red light is OFF

- All the output logic is explained in the tables on the left.

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