

Serial Spec for Transverse (2400) Moisture Sensor

This specification will describe the serial specification for the Transverse program in order that the PLC can receive the board by board data from the planer sensor via a serial channel. The serial connection will be a three wire connection with GND, TX and RX. The serial data will always operate and does not need to be enabled.

The PLC can send data to the moisture sensor. The specification for this is at the end of the document. The

sensor will send packets to the grader which are framed by start Tx (02H) and End Tx (03H) bytes.

When a lug pulse occurs the sensor will transmit a package to the grader with several possible formats depending on the configuration. The format for the beginning of the packet are selected with the "Sensor MC Output with 1-digit precision" checkbox in the General Sensor Settings/Serial Output section of the setup menu. If this checkbox is not checked then the following format is used for the beginning of the packet:

# of Bytes	Description
1	02H (Start Transmit)
1	Status Byte
5	ASCII string with the Overall reading
5	ASCII string with the Peak reading
3	ASCII string with Sensor 1 Reading (if valid)
3	ASCII string with Sensor 2 Reading (if valid)
3	ASCII string with Sensor 3 Reading (if valid)
3	ASCII string with Sensor 4 Reading (if valid)
3	ASCII string with Sensor 5 Reading (if valid)

If this checkbox is checked then the following format is used for the beginning of the packet:

# of Bytes	Description
1	02H (Start Transmit)
1	Status Byte
5	ASCII string with the Overall reading
5	ASCII string with the Peak reading
5	ASCII string with Sensor 1 Reading (if valid) .1precision
5	ASCII string with Sensor 2 Reading (if valid) .1precision
5	ASCII string with Sensor 3 Reading (if valid) .1precision
5	ASCII string with Sensor 4 Reading (if valid) .1precision
5	ASCII string with Sensor 5 Reading (if valid) .1precision

Both formats will end with the following data:

If the "Board ID" checkbox is on then the following data will be added to the end of the above data (will be sent in full and empty lugs):

# of Bytes	Description
4	ASCII string of (4 char null terminated) Board Number (0-255)

If the "Temperature" checkbox is on then the following data is added to the above data (including the board ID if it is enabled):

# of Bytes	Description
6	ASCII string of (6 char null terminated) Board Temperature.

At the end of the packet the following is always output:

# of Bytes	Description
1	03H (End Transmit)

-The status byte will indicate if a sensor has taken a valid reading (0 -not valid, 1 - valid).

Bit 0 is sensor 1, bit 1 is Sensor 2, etc.

Bit 7 of the Status byte will indicate if the lug was empty or full (0 – Empty, 1 – Full).

-On empty lugs all other data should be ignored and will not be valid except the board number if enabled.

-All ASCII strings will use the null character (00H) to mark the end of the string. Sometimes the data will not use all of the available bytes

-The Overall and Peak readings will be sent with a decimal in the string (ex. 28.5) as well as the sensor readings in .1 precision mode and the temperature.

-The serial communication will be 19200, 8 bit, 1 stop, no parity.

-The board data can take up to approx. 20 ms to transmit and will be transmitted as soon as the board leaves the sensor. It is up to the PLC program to match this data to the board.

-It is up to the user to match the number of bytes being sent from the sensor to what is being expected depending on the configuration set.

PLC Communication Protocol

The following is the protocol for communication from the PLC to the moisture sensor.

The serial communication will be 19200 (9600 for Peak/Avg/Bundle mode), 8 bit, 1 stop, no parity.

Presence Detect command

Byte Description

Byte 0 => 30H (Presence detect command)

The Moisture sensor will respond with a package of the following format:

Byte Description

Byte 0 => 02H (Start Transmit)

Byte 1 => 32H (Presence detect response)

Byte 2 - 6 => ASCII string (5 char) with the sensor version number

Byte 7 => 03H (End Transmit)

Change Shift Command

Byte Description

Byte 0 => 32H (Change Shift command)

Byte 1 => 0 to Max shifts (0x00 to 0x02 if max is 3 shifts)

The Change Shift Command will not respond to the host. Note that the shift number sent is 0 based (i.e. the first shift is number 0). A shift number that is outside the max number of shifts will not change the shift but will cause a shift change and report.

Change Stock Command

Byte Description

Byte 0 => 33H (Change Stock command)

Byte 1 => 0 to Max stocks (0x00 to 0x07 if max is 8 stocks)

This command is intended to be used with systems where the stock does not change between boards (i.e. planer run).

The Change Stock Command will not respond to the host. Note that the stock number sent is 0 based (i.e. the first stock is number 0). A stock number that is outside the max number of stocks will not change the stock but will cause a shift change and report.

Send Sorting Stock Code Command

Byte Description

Byte 0 => 34H (Send Sorting Stock Code Command)

Byte 1 => Stock Code - 0 to Max stocks (0x00 to 0x07 if max is 8 stocks)

This command is intended to be used for sending the stock codes of each individual board during sorting. It is up to the user to determine when to send this command to sync with the sorting system. The Send Sorting Stock Code Command will not respond to the host. Note that the stock number sent is 0 based (i.e. the first stock is number 0). A stock number that is outside the max number of stocks will cause the system to use the default stock for that board.

Clear Errors Code Command

Byte Description

Byte 0 => 35H (Send Clear Errors Code Command)

This command will clear the errors on the controller and reset the error outputs. It will not respond to the command.

Send Sorting Stock Code (expanded) Command

Command Byte Description

Byte 0 => 36H (Send Expanded Sorting Stock Code Command)

Byte 1 => Stock Code - 0 to Max stocks (i.e. 0x00 to 0x07 if max is 8 stocks)

Byte 2,3 => Width of Board in mm/.01in

Byte 4,5 => Thickness of Board in

mm/.01in Byte 6,7 => Length of Board in

mm/.1in

Byte 8-11 => Volume of Board in cubic mm/Cubic inches *

1000 Byte 12 => Status byte

Bit 0 => Units of supplied dimensions (0 - Metric, 1 –
Imperial) Bit 1 => WTL of board are valid for the current
board

Bit 2 => Volume of board is valid for the current

board The above data is binary, not ascii coded.

This command is intended to be used for sending the stock codes of each individual board during sorting along with the measured dimensions of the board. The PLC should set which units it is using and indicate which of the readings are valid for the board. If no valid readings are indicated then the controller can default to the dimensions defined in the stock definition.

The controller should try to use the Volume reading first and, failing that, use the WTL dimensions next and then as a last resort use the stock definition numbers.

It is up to the user to determine when to send this command to sync with the sorting system. The controller not respond to the host after being sent this command. Note that the stock number sent is 0 based (i.e. the first stock is number 0). A stock number that is outside the max number of stocks will cause the system to use the default stock for that board.