

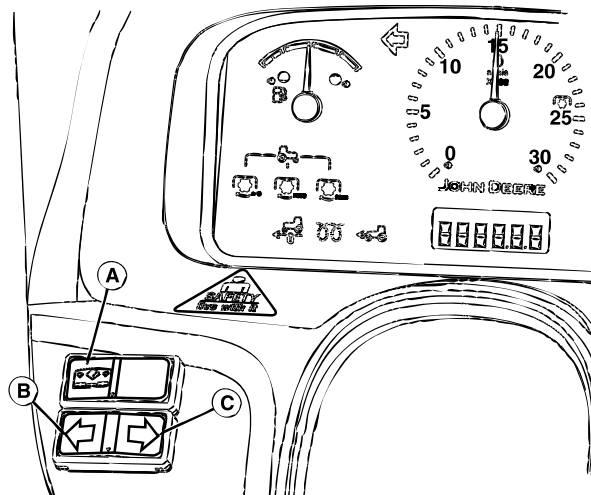
## Entering Diagnostic and Calibration Modes

1. Turn the key switch to ON position.

**NOTE:** Once the display mode switch is depressed, the password must be started to be entered within 2 seconds. The password must be completed within 30 seconds of starting.

If the password is wrong for 3 times, you can not enter the password until after 15 minutes of machine operation.

2. Make sure that no error codes are displayed. If any errors are displayed, momentarily activate the display mode switch (A) to acknowledge the error.
3. Press and hold the display mode switch (A). Within 2 seconds, start entering the password using Left (B) and Right (C) turn signal switch and then release the display mode switch to enter into any of the diagnostic modes as listed below.
4. Press and hold the display mode switch for 2 seconds or turn the key switch to OFF position to exit any of the modes.



A—Display Mode Switch  
B—Left

C—Right

### Diagnostic Mode 1:

**NOTE:** The password is different for each access mode.  
R = Right and L = Left on the turn signal switch.

1. Enter password, RLLRLR. Use this password to get the information that is within the eHydro controller.
2. Select the desired controller with the turn signal switch and momentarily press the display mode switch to acknowledge.

**NOTE:** The diagnostic values are displayed live. The values displayed will change if the components for the item selected are changed. Example, when the forward pedal voltage address is selected, if the forward pedal is pressed, the voltage reading on the display will change also.

3. In this mode, display controller communicates with the controller to get the various parameters. First the address will display and then the value. This cycle will then repeat.
4. Use left (B) or right (C) turn signal switch to navigate through the parameters.

### Diagnostic Mode 2:

**NOTE:** The password is different for each access mode.  
R = Right and L = Left on the turn signal switch.

1. Enter password, LRRRLR. Use this password to get the information that is with in the controller.
2. Select to desired controller with the turn signal switch and momentarily press the display mode switch to acknowledge.
3. This mode display's error codes including occurrence counter. First the SPN code will display, then the FMI, and finally, the code occurrence count. This cycle will then repeat.
4. Use left (B) or right (C) turn signal switch to navigate through the information.

### Diagnostic Mode 3—System Calibration:

**NOTE:** The password is different for each access mode.  
R = Right and L = Left on the turn signal switch.

Password: LLLRLR

The system calibration routine provides for the required machine set-up to factory specifications. It leads step by step through the calibration process of the inputs from the forward pedal sensor, reverse pedal sensor, and throttle sensor, as well as the forward and reverse coil outputs. The system calibration mode is used to match the sensors and coils to the electronic drive controller. See TCU—System Calibration in Section 40, Group 30.

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## Readings Codes by Controller

Diagnostic Mode 1

RLLRLR

These addresses are for all IT4 4x20 tractors.

Turn signal inputs will be used for scrolling through the connected controllers list and a controller is selected by a click on "Display Mode Input."

Turn signal inputs are used for scrolling through the addresses.

Right turn signal will be used to increment the address and left turn signal to decrement the address.

When the "Display Mode Input" is activated for up to 2 seconds, the module will exit this mode to normal mode. The module will be in normal mode to activate this mode.

When reading digital inputs or outputs (logic level), a "1" will indicate active and a "0" will indicate inactive. Bit 0 is on the far right of the display and bit 5 is on the far left.

### ICC Readings (Listed by Address):

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 0	Diagnostic Mode	x	x	0=Off; 1=Diagnostics.; 2=Diagnostics at start up; 3=Calibration Mode; 4=Next Calibration.; 5=End Calibration; 6=Abort
RLK 3	Speed Units	x	No Decimal; Numeric;	0=MPH;1=KMPH
RLK 4	Wheel Circumference	mm	No Decimal; Numeric;	x
RLK 5	Motion Match/Load Match Switch Options	x	BCD Numeric;	0=No Motion Match switch Installed; 1=Switch installed; Upper Nibble 0= No Load Match switch installed; 1=Switch installed
RLK 6	Speedometer Enable		No Decimal; Numeric;	0=Disable;1=Enable
RLK 7	Tractor Type/Operator Station Type	x	BCD Numeric;	0=Config;1=PRT;2=HST; 3=HRT; Upper Nibble 0=OpenStation; 1=Cab
RLK 8	Engine Type	x	Numeric;	0=MFI;1=EFI
RLK 11	Engine Speed Frequency	Hz	Numeric;	x
RLK 12	Engine Speed RPM	RPM	Numeric;	x
RLK 13	Engine Speed Constant	x	Numeric;	x
RLK 14	Coolant Temperature Input	Volts	Decimal (X.XX); Numeric;	x
RLK 15	Coolant Temperature	Deg. C	Numeric;	x
RLK 16	Coolant Temperature Gauge	%	No Decimal; Numeric;	x
RLK 17	Fuel Gauge Input	Volts	Decimal (X.XX); Numeric;	x
RLK 18	Fuel Gauge %	%	No Decimal; Numeric;	x
RLK 19	Display Mode switch	Volts	Decimal (XX.X); Numeric;	x
RLK 20	Seat Switch	Volts	Decimal (XX.X); Numeric;	x
RLK 21	Battery Supply	Volts	Decimal (XX.X); Numeric;	x
RLK 22	Digital Inputs [0]	x	Numeric;	Bit0=Warning Input(J4-M); Bit1=Bit1=Rear PTO 750/540E; Bit2=Spare DI (J4-P); Bit3=Air Filter (J1-G); Bit4=Park Brake (J1-K); Bit5=Low Oil Pressure (J1-J)
RLK 23	Digital Inputs [1]	x	Numeric;	Bit0=Rear PTO 540 (J2-F); Bit1=Mid PTO Off (J3-D); Bit2=Front PTO (J3-A);Bit3=Not Used; Bit4=Not Used; Bit5=Not Used
RLK 24	Digital Inputs [2]	x	Numeric;	Bit0=MFWD (J4-A); Bit1=Engine Crank (J4-D); Bit2=Neutral (J1-B); Bit3=Left Arrow (J2-E); Bit4=Switched Battery (J1-A); Bit5=Start Aid (J2-C)

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# Service Codes

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 25	Digital Inputs [3]	x	Numeric;	Bit0=Right Arrow (J2-D); Bit1=Rear PTO Off (J4-K); Bit2=Left Hazard Feedback; Bit3=Right Hazard Feedback; Bit4=Left Turn Feedback; Bit5=Right Turn Feedback
RLK 26	Digital Outputs [0]		Numeric;	Indicator lamps: Bit0=Rear750/540 PTO; Bit1=Not Used; Bit2=Air Filter Restriction; Bit3=MFWD; Bit4=Mid PTO; Bit5=Rear 540 PTO
RLK 27	Digital Outputs [1]		Numeric;	Indicator lamps: Bit0=Engine Oil Pressure; Bit1=Cruise Control; Bit2=Glow Plugs; Bit3=Battery Discharge; Bit4=Park Brake; Bit5=Emergency Stop
RLK 28	Digital Outputs [2]		Numeric;	Indicator lamps: Bit0=Operator Alert; Bit1=Left Turn; Bit2=Right Turn; Bit3=Not Used; Bit4=Not Used; Bit5=Left Turn Driver
RLK 29	Digital Outputs [3]		Numeric;	Bit0=Right Turn Driver; Bit1=Left Hazard; Bit2=Right Hazard; Bit3=Pull In Driver (J4-N); Bit4=Hold In Driver (J4-B); Bit5=Starter Driver (J4-C)
RLK 30	Analog Inputs [0] - Battery Voltage	ADC	No Decimal; Numeric;	
RLK 31	Analog Inputs [1] - Battery Charge	ADC	No Decimal; Numeric;	
RLK 32	Analog Inputs [2] - Fuel Level	ADC	No Decimal; Numeric;	
RLK 33	Analog Inputs [3] - Temperature	ADC	No Decimal; Numeric;	
RLK 34	Analog Inputs [4] - Starter FB	ADC	No Decimal; Numeric;	
RLK 35	Analog Inputs [5] - Hold-in FB	ADC	No Decimal; Numeric;	
RLK 36	Analog Inputs [6] - Pull-in FB	ADC	No Decimal; Numeric;	
RLK 37	Analog Inputs [7] - PTO FB	ADC	No Decimal; Numeric;	
RLK 38	PWM Output Freq.	Hz	No Decimal; Numeric;	
RLK 39	PWM Duty Cycle	%	No Decimal; Numeric;	
RLK 40	Auto Clear DTC	Hours	No Decimal; Numeric;	
RLK 41	Wheel Speed Input	Hz	No Decimal; Numeric;	
RLK 70	Password for Editing		No Decimal; Numeric;	
RLK 227	Boot Block Part Number		ASCII	
RLK 228	Boot Block Version Number		Numeric;	
RLK 229	EOL Part number		ASCII	
RLK 230	EOL Version Number		Numeric;	
RLK 231	OS Part number		ASCII	
RLK 232	OS Version Number		Numeric;	
RLK 233	Application Part Number		ASCII	
RLK 234	Application Version Number		Numeric;	
RLK 235	Device Part Number (JD PN#)		ASCII	
RLK 236	Device Serial Number		Numeric;	

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## Service Codes

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 237	Software Assembly Part number		ASCII	
RLK 238	Software Assembly version number		Numeric;	
RLK 245	Number of CAN bus OFF retries.		Numeric;	
RLK 246	Interval Between CAN bus OFFs.		Numeric;	
RLK 249	Vehicle Model Number		ASCII	
RLK 250	Vehicle Serial Number (Last 6 digits in VIN)		ASCII	
RLK 251	13 Character Tractor Serial Number (VIN)		ASCII	
RLK 255	Number of Diagnostic addresses supported at this level within this controller.		No Decimal; Numeric;	

### TCU Readings (Listed by Address):

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 0	Diagnostic Mode			0=Off; 1=Diagnostics.; 2=Diagnostics at start up; 3=Calibration Mode; 4=Next Calibration.; 5=End Calibration; 6=Abort
RLK 3	Load Match Switch option		No Decimal; Numeric;	1=No Load Match Switch installed; 2=Switch installed
RLK 4	Motion Match Switch option		No Decimal; Numeric;	1=No Motion Match switch installed; 2=Switch installed
RLK 5	Wheel Circumference	MM	Numeric;	
RLK 6	Calibration Switch (Software)		No Decimal; Numeric;	0=Disable;1=Enable
RLK 7	Operating/Calibration Status		ASCII	
RLK 8	Motion Match Setting 1		Numeric;	
RLK 9	Motion Match Setting 2		Numeric;	
RLK 10	Engine Type		Numeric;	0=MFI;1=EFI
RLK 11	Wheel Speed Constant		Numeric;	
RLK 12	Wheel Speed	KM/H	Decimal (XX.X); Numeric;	
RLK 13	Load Match Switch (Software)		No Decimal; Numeric;	0=Disable; 1=Enable
RLK 14	Load Match Switch Input		No Decimal; Numeric;	0=OFF;1=ON
RLK 15	Motion Match Switch Input		No Decimal; Numeric;	0=OFF;1=ON
RLK 16	Operator Present Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 17	Cruise On/Off Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 18	Cruise Resume/Acceleration Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 19	Cruise Set/Deceleration Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 20	Set Max Speed Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 21	Brake Switch		No Decimal; Numeric;	0=OFF;1=ON
RLK 22	Cruise On Dig Out		No Decimal; Numeric;	0=OFF;1=ON
RLK 23	Fault Dig Out		No Decimal; Numeric;	0=OFF;1=ON
RLK 24	Backup Dig Out		No Decimal; Numeric;	0=OFF;1=ON
RLK 25	Machine State		Numeric;	
RLK 26	State Direction		ASCII	
RLK 27	Cruise Setpoint	Hz	Numeric;	
RLK 28	Cruise Error	Hz	Numeric;	

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## Service Codes

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 29	MFWD Speed	Hz	Numeric;	
RLK 30	Filtered MFWD Speed	Hz	Numeric;	
RLK 31	Engine PPU	Hz	Numeric;	
RLK 32	Engine Speed	RPM	Numeric;	
RLK 33	Engine Speed Setpoint	RPM	Numeric;	
RLK 34	Sensor Supply	Volts	Decimal (X.XX); Numeric;	
RLK 35	Forward Pedal	Volts	Decimal (X.XX); Numeric;	
RLK 36	Reverse Pedal	Volts	Decimal (X.XX); Numeric;	
RLK 37	Throttle Sensor	Volts	Decimal (X.XX); Numeric;	
RLK 38	Throttle	%	No Decimal; Numeric;	
RLK 39	Forward Pedal	%	No Decimal; Numeric;	
RLK 40	Reverse Pedal	%	No Decimal; Numeric;	
RLK 41	Max Command	%	No Decimal; Numeric;	
RLK 42	Feed Forward	%	No Decimal; Numeric;	
RLK 43	PID Command	%	No Decimal; Numeric;	
RLK 44	Command	%	No Decimal; Numeric;	
RLK 45	Max Spd Lim Cmd	%	No Decimal; Numeric;	
RLK 46	State Command	%	No Decimal; Numeric;	
RLK 47	Load Match	%	No Decimal; Numeric;	
RLK 48	Load Match Command	%	No Decimal; Numeric;	
RLK 49	Final Command	%	No Decimal; Numeric;	
RLK 50	Direction Command		ASCII	
RLK 51	Current Output	mA	Numeric;	
RLK 52	Load Resistance	Ohms	Decimal (XX.X); Numeric;	
RLK 53	Compatibility Code		Numeric;	
RLK 54	Forward Threshold	mA	Decimal (XXX.X); Numeric;	
RLK 55	Reverse Threshold	mA	Decimal (XXX.X); Numeric;	
RLK 56	Forward Pedal Cal Low	Volts	Decimal (X.XX); Numeric;	
RLK 57	Forward Pedal Cal High	Volts	Decimal (X.XX); Numeric;	
RLK 58	Reverse Pedal Cal Low	Volts	Decimal (X.XX); Numeric;	
RLK 59	Reverse Pedal Cal High	Volts	Decimal (X.XX); Numeric;	
RLK 60	Throttle Sensor Cal Low	Volts	Decimal (X.XX); Numeric;	
RLK 61	Throttle Sensor Cal High	Volts	Decimal (X.XX); Numeric;	
RLK 62	Automotive Mode Switch		Numeric;	0=Disable;1=Enable
RLK 70	Password for Editing		Numeric;	
RLK 227	Kernel Part Number		ASCII	
RLK 228	Kernel Version Number		Numeric;	
RLK 229	Configuration Data Part number (EOL)		ASCII	
RLK 230	Configuration Data Version Number (EOL)		Numeric;	
RLK 233	Application Part Number		ASCII	
RLK 234	Application Version Number		Numeric;	
RLK 235	Device Part Number (JD PN#)		ASCII	
RLK 236	Device Serial Number		Numeric;	
RLK 237	Software Assembly Part number		ASCII	
RLK 238	Software Assembly version number		Numeric;	
RLK 249	Vehicle Model Number		ASCII	
RLK 250	Vehicle Serial Number (Last 6 digits in VIN)		ASCII	

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## Service Codes

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 251	13 Character Tractor Serial Number (VIN)		ASCII	
RLK 255	Number of Diagnostic addresses supported at this level within this controller.		Numeric;	

### ECU Readings (Listed by Address):

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 0	Device ID			
RLK 1	Recall Trouble Codes		No Decimal; Numeric; System Beep;	
RLK 2	System Beep Address		Most Significant Decimal (X.XX); Numeric;	
RLK 6	Throttle	%	Most Significant Decimal (X.XX); Numeric;	
RLK 7	Unswitched Battery Voltage	Volts	Most Significant Decimal (X.XX); Numeric;	
RLK 8	Switched Battery Voltage	Volts	Most Significant Decimal (X.XX); Numeric;	
RLK 9	Sensor Excitation 1 Voltage	Volts	Numeric;	
RLK 10	Sensor Excitation 2 Voltage	Volts	Numeric;	
RLK 12	Crank Sensor	rpm	Numeric;	
RLK 13	Cam/Event Sensor	rpm	Numeric;	
RLK 14	Governor Reference Speed	rpm	Numeric;	
RLK 15	Engine Speed	rpm	Numeric;	
RLK 16	All Speed Governor Parameter ID		No Decimal; Numeric;	
RLK 17	Max Speed Governor Parameter ID		Numeric;	
RLK 18	Min Speed Governor Parameter ID		No Decimal; Numeric;	
RLK 19	Torque Curve Parameter ID		No Decimal; Numeric;	
RLK 20	Engine Coolant Temperature		No Decimal; Numeric;	
RLK 22	Fuel Mode. Fuel Mode		No Decimal; Numeric;	0=Engine Stopped;1=Start Control;2=See Governor Mode;3=Throttle Table;4=Bus Fuel Request;5=See Max Fuel Mode;6=Cylinder Diagnostics;7=Engine Protection Shutdown;
RLK 23	Fuel Mode. Governor Mode		No Decimal; Numeric;	0=See Min Speed Mode;1=See Desired Speed Mode;2=See Max Speed Mode;
RLK 24	Fuel Mode. Desired Speed Mode		No Decimal; Numeric;	0=Throttle;1=Bus Speed Request;
RLK 25	Fuel Mode. Maximum Speed Mode		No Decimal; Numeric;	0=Normal;1=Bus Max Speed Limit;2=Road Speed Limiting;3=Engine Protection;4=Absolute Maximum;5=Bus Momentary Override;6=Engine Protection Override;
RLK 26	Fuel Mode. Minimum Speed Mode		No Decimal; Numeric;	0=Normal Low Idle;1=Alternate High Idle;2=Fast Engine Warm-up;3=Vehicle Control;

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## Service Codes

Address	Address Name/DPN	Units	Attributes	Discrete Values
RLK 27	Fuel Mode. Maximum Fuel Mode		No Decimal; Numeric;	0=Torque Curve;1=Air/Fuel Control;2=Engine Protection;3=Torque Spike Limiting;4=Progressive Shift;5=Bus Torque Limit Request;6=Absolute Maximum Torque Curve;
RLK 28	Fuel Pressure	kPa		
RLK 29	Fuel Temperature	Degrees C	No Decimal; Numeric;	
RLK 30	Fuel Rate	L/h	Most Significant Decimal (X.XX); Numeric;	
RLK 31	Manifold Air Temperature	Degrees C	No Decimal; Numeric;	
RLK 32	Percent Load	%	No Decimal; Numeric;	
RLK 33	Desired Fuel	mg/stroke	No Decimal; Numeric;	
RLK 34	Remaining Start Aid Time	Seconds	No Decimal; Numeric;	
RLK 37	Fuel Derate	%	No Decimal; Numeric;	100.00 = Full Power
RLK 42	Barometric Pressure	kPa	No Decimal; Numeric;	
RLK 51	EEPROM Calibration Value 1		No Decimal; Numeric;	
RLK 52	EEPROM Calibration Value 2		No Decimal; Numeric;	
RLK 59	Harness Diagnostics Mode Request			
RLK 69	Fuel Pump Priming	State	No Decimal; Numeric;	00=Do Not Activate Priming;01=Activate Priming;
RLK 100	Analog Throttle	Volts	Beep; Numeric;	
RLK 108	Fuel Pressure	Volts	Beep; Numeric;	
RLK 109	Coolant Temperature	Volts	Beep; Numeric;	
RLK 110	Fuel Temperature	Volts	Beep; Numeric;	
RLK 112	Manifold Air Temperature	Volts	Beep; Numeric;	
RLK 141	External Shutdown Switch		Beep; No Decimal Numeric;	
RLK 143	ELX power		Beep; No Decimal Numeric;	
RLK 150	Cold Start Relay Diagnostics		Beep; No Decimal Numeric;	
RLK 170	Engine Speed Beep Mode	rpm	Beep; No Decimal Numeric;	
RLK 171	Cam/Secondary Engine Speed Beep Mode	rpm	ASCII	
RLK 200	Engine Model Number		ASCII	
RLK 201	Engine Serial Number		ASCII	
RLK 223	Option Assembly Number		ASCII	Option Assembly part number
RLK 225	Configuration File Part Number		ASCII	
RLK 227	Boot Block Part Number		ASCII	
RLK 229	EOL Part Number		ASCII	
RLK 233	Op Code Part Number		No Decimal; Numeric;	
RLK 235	ECU Part Number		No Decimal; Numeric;	
RLK 236	ECU Serial Number		No Decimal; Numeric;	
RLK 245	BUS Off NVM Number of Retries		No Decimal; Numeric;	
RLK 246	BUS Off NVM Time Between Retries		ASCII	
RLK 251	13 Character PIN VIN without Option Bytes			
RLK 255	Supported Diagnostic Address List			

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## Configuration Codes Overview

The configuration codes are used to display and adjust the machine for installed options and equipment. These codes are displayed and adjusted through the display panel or Service ADVISOR.

An example of the format for these codes would be: "01 27", where "01" is the address and "27" is the configuration value as seen on the display panel LCD.

For more information, [see Configure the Display](#) in Section 40, Group 30.

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## Configuration Codes by Controller

### Configuration through the Display:

Address	Configuration Parameter	Configuration Value
00 xx	Access Level One.	Value = 00 0A
01 xx	Ground Speed Units Select.	Value in the ones place=Even - MPH;Odd - km/h.
02 xx and 03 xx	Base Tire Size. <a href="#">See Editing Tire Size</a> Value in Section 40, Group 30.	Default value = 3683. The default code will read, 02 36 and 03 83.
04 xx	Load Match/Motion Match Option. eHydro only.	Value: Tens place = Load Match switch; Ones place = Motion Match; Value of 0 = No switch installed (default); Value of 1 = Switch installed.
05 xx	Wheel Speed Enable. eHydro only	Value of 00 = Disabled; Value of 01 = Enabled.
06 xx	Model Selection.	Value of 00 = New Unit OS; Value of 01 = PRT OS; Value of 02 = eHydro OS; Value of 10 = New Unit Cab; Value of 11 = PRT Cab; Value of 12 = eHydro Cab
07 xx -0A xx	Engine Type	00 = MFI01 = EFI

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