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AD30-2WD CHASSIS DYNO CONFIGURATION FILE DESCRIPTION

Original Instructions

www.SuperFlow.com

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Please keep this manual for future reference.

This manual is intended to assist operating personnel in becoming familiar with the product and as guidance in ordering necessary parts inclusive of SuperFlow's warranty requirements. Maximum operating efficiency and life of any SuperFlow product will be attained through complete understanding of the instructions and recommendations contained within this manual.

A WARNING

Services performed beyond preventive maintenance by personnel other than SuperFlow Service Technicians on any SuperFlow products during the warranty period may void the warranty.

IMPORTANT

When available, please include the model number and serial number of the product in any correspondence.



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1.1 Overview

The Configuration file is used to define the functions of WinDyn[™] and the Next Generation Electronics (NGE) Data Acquisition System. The channel functions, control functions, and the console display are all set in the Configuration file. Once established, the file is stored on the computer hard drive and downloaded to the Data Acquisition System (memory). The Configuration file defines the basic elements of WinDyn and is required for proper operation.

Refer to WinDyn Users Guide for more information on the configuration file and how to modify it.

1.2 WinDyn Configuration File Editor

WinDyn Configuration File Editor is a simple and powerful built-in editor. The editor can be used to edit the system configuration (config) file discussed in this manual. To edit the system config file, simply open the editor's program window by navigating to **DESIGN > SYSTEM CONFIGURATION** within WinDyn as illustrated in Figure 1.1. To open the system config file in the editor, click on the **FOLDER** icon or select **FILE > OPEN** and navigate to the directory where the config file is located.

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Figure 1.1: Accessing Editor

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Figure 1.2: Editor Window



1.3 Channel Types

Five general channel types are available in the WinDyn system:

- Sensor Channels: Receive data from sensors
- Equations: Perform calculations using inputs from other channels
- Specifications: Store constants associated with a particular engine, vehicle, or test
- Interpolation Tables: Store nonlinear functions for calibration and calculation purposes
- System Channels: Contain timers and system memories

The editor identifies channel types by the following colors.

- Gray = System Maroon = Voltage Inputs
- **Blue** = Equations
- **Green** = Specifications
 - **Pink** = Interpolation Tables
- Purple = Frequency Inputs
 Red = Thermocouple Inputs

1.4 Channel Functions

The channels listed in this section are in the standard default configuration file for the dynamometer system. Actual configurations may vary based on the product and the customer application. Gaps in the numbering are undefined channels or are sensor channels used as calculated channels.

1.4.1 Sensor Channels

Sensor channels 1 through 76 input measured data and convert it to a reading. In some cases the reading is a direct reflection of the input, such as volts in to volts out. In other cases the input is converted to a different value, such as volts in to air/fuel (A/F) ratio out or frequency to rpm. Temperature channel values are determined by the type of thermocouple used.

Filters

The default system filter on 2640 boards is 6. All measured channels in released configs are set to system filter except AirSen(ch1), HumSen(ch6), and BaroP(ch76). Those channels are set to 7. System filters are controlled via commands in a test profile or via menu selection in NetDyn.

Filter Rates

1	=	20Hz corner	5	=	1.25Hz corner
2	=	10Hz corner	6	=	0.625Hz corner

- 3 = 5Hz corner
- 7 = 0.3125Hz corner
- 4 = 2.5Hz corner

Channel Types

Four types of measured data channels are available in the SuperFlow Data Acquisition system for sensor inputs:

 Frequency channels can read any sensor device (0-15 KHz) that provides a magnetic (MAG) or Transistor-Transistor Logic (TTL) output. These channels are typically used for fuel, air, and fluid flow meters. Six frequency channels are available directly on the data acquisition, but others can be added with a frequency-to-voltage converter on an analog voltage expansion panel.

IMPORTANT

- The channel name and unit of measurement for each channel shown in the channel definition tables is the default configuration as set by SuperFlow. The user can alter the actual name and unit of measurement through the configuration editor.
- The unit of measurement used in Equation channels is based on the formula in the channel definition. The unit of measurement for Specification channels is based on how it is used within the system. Changing the format for the unit of measurement does not change how the channel functions.
- The full range value of each sensor channel is based upon the normal range of the sensor used in that channel and by the defined unit of measurement. The default full-scale range value in the system can be overwritten by a current value calibration of the channel.



Figure 1.3: Config Frequency Channel Window



 Thermocouple channels can be configured for several different types of thermocouples (K, J, T, or E) and can be read in either Fahrenheit or Celsius degrees.

Analog voltage channels may be used to measure any sensor device outputting analog voltage (typically 0-10 VDC). These inputs are most commonly used for pressure transducers or other auxiliary devices. Ten channels are located directly on the data acquisition system. Others are available on expansion panels (pressure and voltage).



Figure 1.5: Config Voltage (Pressure) Channel Window



Figure 1.4: Config Thermocouple Channel Window

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Figure 1.6: Config Voltage Channel Window

Any of these channels may be used for any display function, in a equation channel, as a control channel, or in a test profile.



Table 1-2. Sensor Channels

Channel

1 - AirSen

Channel 1 is used to measure the voltage from the ambient air temperature sensor. This channel is used in channel 74 in conjunction with lookup table 136 to produce temperature units in degrees F for use in horsepower correction formulas. Calibrate this channel before doing humidity.

2 - Trq1

Channel 2 is used to measure the torque from the strain gauge mounted to the eddy current absorber. This channel should be calibrated by the end user. Low level offset should be adjusted to provide maximum range for the end user and vehicle types. If using in a bi-directional mode, the cal coefficient must produce a positive TRQ1 value for Track Road Load (TRL) to function. The coefficient will be changed through calibration. The channel is set up for zeroing by command.

4 – LamVt1

Channel 4 is used for auxiliary voltage input 1. It uses a 0–10 VDC input signal. Used for Wideband O2 inputs. The channel is not zeroed by command.

5 - LamVt2

Channel 5 is used for auxiliary voltage input 2. It uses a 0-10 VDC input signal. Used for Wideband O2 inputs. The channel is not zeroed by command.

6 - HumSen

Channel 6 is the input for the humidity sensor used to measure the humidity of the air. It is used in channel 120 to produce humidity units in % relative humidity for use in vapor pressure computations which are used in horsepower correction formulas. This channel has a coefficient of 1.000, no autozero, and is filtered at 7. Changing the values for this channel is not recommended. Changing the coefficient alters the values displayed by channel 120.

7 - Freq_1

Channel 7 is typically used to measure the frequency from an air turbine. Labeled Air 1 (Red Lemo), the coefficient for this channel is 1.000, with a maximum input frequency of 15,000 hz. Changing the coefficient alters the values displayed.

8 - Freq_2

Channel 8 is typically used to measure the frequency from a fuel turbine. Labeled Fuel 1 on interconnect AMP panel, the coefficient for this channel is 1.000, with a maximum input frequency of 15,000 hz. Changing the coefficient alters the values displayed.

9 - RolFrq

Channel 9 is used to measure the frequency from the roll speed sensor. Jumpered via R85 to R79 on -2640 board; couples raw roll frequency to use for Calculated RPM method. Allows Pro Filter to work properly on Calculated RPM method. The coefficient for this channel is 1.000, with a maximum input frequency of 15,000 hz. Changing the coefficient alters the values displayed.

10 - Speed

Channel 10 is used to measure the frequency from a Hall Effect pickup and 60 tooth gear. It is used by channel 125 to calculate engine speed. Changing the coefficient alters the values displayed and severely alters the dynamometer calibration. Changing the values for this channel is not recommended. Uses 11.227 for 29.94 inch AD-30 rollset.



Table 1-2. Sensor Channels

Channel

11 - EngFrq

Channel 11 is defined as an auxiliary frequency channel. It is used for external RPM input from the vehicle using the Green Lemo on interconnect panel. It can accommodate multiple input types: Inductive, Coil, Optical. The coefficient for this channel is 1.000, with a maximum input frequency of 15,000 hz. Changing the coefficient alters the values displayed.

12 - Freq12

Channel 12 is defined as an auxiliary frequency channel. Input is labeled Tach/Freq on Yellow Lemo connector. The coefficient for this channel is 1.000, with a maximum input frequency of 15,000 hz. Changing the coefficient alters the values displayed.

45 - BoostP

Channel 45 is setup as Pressure Input 1 to measure the voltage from the Boost Pressure sensor. The channel uses a 0–10 VDC input. It may be recalibrated if required through the calibration menu or through changes in the Configuration Editor program. The channel is set for zeroing by command.

46 - Pres2

Channel 46 is setup as Pressure Input 2 to measure the voltage from a sensor. The channel uses a 0–10 VDC input. It may be recalibrated if required through the calibration menu or through changes in the Configuration Editor program. The channel is set for zeroing by command.

47 to 50 - Analog Voltages - AnVt47 through AnVt50

Channels 47 through 50 are used for measuring DC voltage inputs. They are currently defined for 0–10 VDC inputs. Each channel may be recalibrated if required through the calibration menu or through changes in the Configuration Editor program. These channels are set to not zero by command.

51 - OilTmp

Channel 51 is setup to measure the voltage from the oil temperature dipstick probe. The channel uses a 0–10 VDC input. It may be recalibrated if required through the calibration menu or through changes in the Configuration Editor program. The channel is set to not zero by command.

52 - Batt_V

Channel 52 is setup to measure the voltage from the battery voltage input. The channel uses a 0–20 VDC input. It may be recalibrated if required through the calibration menu or through changes in the Configuration Editor program. The channel is set to not zero by command.

71 - AbsSen

Channel 71 is used to measure the voltage from the absorber temperature sensor and is used for absorber temperature calculation. The channel is set to not zero by command and is filtered at 7. Changing the values for this channel is not recommended. Changing the coefficient alters the values displayed.

76 - BaroP

Channel 76 is used to measure the uncorrected or station barometric pressure. The barometric pressure transducer is located on the circuit board installed in the sensor box. SuperFlow recommends calibrating the barometric pressure sensor with an accurate barometric pressure measurement device. The channel is set to not zero by command and is filtered at 7. The default coefficient for the channel should be 8.0391. This channel is used for horsepower correction formulas and must use station pressure, not relative pressure.



1.4.2 Specification Channels

Channels 77 through 99 are all specifications or constants. The values shown here are defaults, and may be changed as necessary by the end user.





Channel	Default Value			
77 - K_Fact	0.0700			
Channel 77 is an Engine Power channel for entering the K_Factor for drivetrain losses. This value specifies what percentage of the total drivetrain losses on a vehicle are Torque Dependent vs. Speed Dependent. This is an operator specified "correction" channel to produce proper engine power results. During a coast down, the dyno measures all of the speed dependent losses, but only a fraction of the torque dependent losses. The torque that is going through the vehicle drivetrain during coast down is much less than it was during the acceleration run. By entering the proper value, the system can more accurately derive what the drive train losses were during acceleration by slightly altering what it measured during a coast down test. Typical values for manual transmission vehicles are 0.07 - 0.09. Automatic equipped vehicles may require values as high as 0.30. The default value is 0.07.				
78 - Corfac	1.1000			
Channel 78 is for entering the operator input correction factor. Channel 78 is dynamometer systems and equation channels 58 - DJWhTq and 114 - DJWh defaulted to a 10% (default value 1.10) correction factor.	used for comparison to other Pw use this factor. The channel is			
79 - Pwr_50	15			
Channel 79 is a Track Road Load (TRL) channel for target power at 50mph. horsepower. This can be altered by the user if they have values obtained from testing.	Channel 79 is defaulted to 15 n the vehicle manufacturer or EPA			
80 - Whlinr	125			
Channel 80 is the inertia value for wheels. Channel 80 is defaulted to 125lbs motorcycles, 60 for quads or Razors, 125 for cars, and 200 for trucks for 2WI systems. You can use 0 for 2wd systems, but will show significantly lower por acceleration type tests.	for 2WD systems. Suggest using 40 for D systems. Suggest using 0 for AWD ower numbers (up to 10%) when doing			



Channel	Default Value
81 - Stoich	14.700
Channel 81 is used to input the Stoichiometric ratio. Typical values for chann E85 = 9.86, Methanol = 6.5. The channels default value is 14.7 (pump gas).	el 81: pump gas = 14.7, E10 = 14.13,
82 - K_SE	0
Channel 82 is a TRL channel used to enter an Inertia Simulation Error K-fact TRL as an integration of the error between the commanded "Target" torque ((ACTtrq): SEtrq = (ACTtrq-TGTtrq)*Kfactor. Defaulted to use 0 on Eddy cu the Simulation Error correction to the TRL setpoint command. THIS MUST B	or. Defined as a correction factor in TGTtrq) and measured "Actual" torque rrent systems. Setting it to 0 will disable E IN CHANNEL 82!!!!
83 - Pul_Rv	1.000
Channel 83 is used to enter the number of pulses per revolution specification Typically, use 0.5 or 1.0 as the setting. Default is 1.0 for wasted spark ignition	n channel for the ignition pickup. ns.
84 - TirDia	24.000
Channel 84 is used to enter the tire diameter in inches. The channel is used torque equation. Default value is 24.	in calculated RPM method and ground
85 - IgnPck	0.000
Channel 85 is used as an ignition pickup selection switch. Default is 0, enter ignition tach signal input.	a one (1) when using Green Lemo
86 - OpTPck	0.000
Channel 86 is used as an optical tach pickup selection switch. Default is 0, e optical tach signal input.	nter a one (1) when using Green Lemo
87 - CalPck	1.0000
Channel 87 is used as a selector switch for the calculated engine speed met signal input to compute engine RPM. Default is set to "1"	hod. Use a "1" when using roll speed
88 - CoeffA	13.610
Channel 88 is a TRL channel used to set the A Coefficient - AvPF, Av, or Af. 5 mode. See Track Road Load instructions. Customer must derive values for c mid-size sedan, 13.61. THIS MUST BE IN CHANNEL 88!!!!	Set to use Imperial units in FORCE ars and trucks. Default value Af is for a
89 – CoeffB	0.0800
Channel 89 is a TRL channel used to set the B Coefficient - BvPF, Bv, or Bf. mode. See Track Road Load instructions. Customer must derive values for c mid-size sedan, 0.080. THIS MUST BE IN CHANNEL 89!!!!	Set to use Imperial units in FORCE ars and trucks. Default value Bf is for a
90 - CoeffC	0.0200
Channel 90 is a TRL channel used to set the C Coefficient - CvPF, Cv, or Cf. mode. See Track Road Load instructions. Customer must derive values for c mid-size sedan, 0.020. THIS MUST BE IN CHANNEL 90!!!!	Set to use Imperial units in FORCE ars and trucks. Default value Cf is for a



Channel	Default Value
91 - Weight	3700.0
Channel 91 is a TRL channel used to enter Equivalent Vehicle Test Weight in FORCE mode. See Track Road Load setup instructions. Default value is 370 BE IN CHANNEL 91!!!!.	pounds. Set to use Imperial units in 0lbs for a mid-size sedan. THIS MUST
92 - TRLHP	-1.000
Channel 92 is a TRL channel used as a Track Road Load Power selector. If the any negative value, then the A, B, and C coefficients are used in FORCE monoton TRLHP value is set to a positive non-zero value, then the A, B, and C coefficients are used in FORCE monotons, as defined by the EPA- IM240 specifications §85.2226(a)(2)(i)(D). mode. If the entered TRLHP value is set to zero, then the A, B, and C coefficients the polynomial. This will be called RAW POWER mode. THIS MUST BE IN C	he entered TRLHP value is set to de. This is the DEFAULT mode. If the ients are considered to be "Power This will be called POWER FRACTION ients are the raw power coefficients of CHANNEL 92!!!!
93 - Recpcl	1.000
Channel 93 is a reciprocal value used by the ProFilter feature to properly call in ratio mode. This value is controlled by the test profile. This channel is used counter channel. The user should not alter it.	culate engine speed increments when I when setting up the ProFilter rev
94 - RPMRat	1.000
Channel 94 is used to calculate engine RPM when using an optical tach on a ratio to engine revolutions. If you are using the optical tach on the rear wheel ratio, which would be primary ratio * transmission ratio * final drive ratio = over	revolving device that is at a non 1:1 , then this would represent the overall erall ratio. Default value is 1:1
95 - Start	40.00
Channel 95 is for entering the starting value in MPH to use for automated tes Step tests. It may be changed from the test setup dialog.	t profiles. Typically used in Accel and
96 - StopAt	100.0
Channel 96 is for entering the ending value in MPH to use for automated test Step tests. It may be changed from the test setup dialog.	t profiles. Typically used in Accel and
97 - StepTm	20.00
Channel 97 is used to enter the step time increment in seconds for the step t changed from the test setup dialog.	ype automated tests. It may be
NOTE: If running an Accel test, this value will be automatically calculated. The value. If running a STEP test, the operator will need to enter this value.	ne operator does not need to enter this
98 - StpSiz	10.00
Channel 98 is used to enter the requested step size or ramp increment in MF It may be changed from the test setup dialog.	PH for step type automated test profiles.



Channel	Default Value
99 - Metric	0.000
Channel 99 is used as a Metric/English force units selector switch. As of this appear to work. The EIS will not compute properly when the vehicle weight is appears to compute using the value as if it were in pounds units. So, by defa units. THIS MUST BE IN CHANNEL 99!!!!	writing, the METRIC function does not entered in kilogram units. The math ult, 0.000 is used to select Imperial
The values for this channel are as follows:	
>0 or 100 = If an AC motor and EC are both tied to the system, use 0 to se	lect Imperial units and
the AC motor. Use 100 to select Imperial units and the Eddy	Current.
>1 or 101 = If an AC motor and EC are both tied to the system, use 1 to se	lect metric units and
the AC motor. Use 101 to select metric units and the Eddy C	Current.
If there is no AC motor, only an Eddy Current, then either 0 or 100, or 1 or 10 unit.	1, will work to engage the eddy current
The A, B, C coefficients and inertia value can be entered in either Imperial or or 100 then these coefficients are in Imperial units:	metric units. If channel 99 is set to zero
Af = lbs(force), Bf = lbs/mph, and Cf = lbs/mph2.	
If channel 99 is set to 1 or 101, then the force coefficients are entered in met	ric units:
Af = N(Newtons) Bf = N/kph, and Cf = N/kph2.	
See Track Road Load setup instructions.	



1.4.3 Equations

The Equation channel is one of the most powerful features of the WinDyn software. Sensor data, specifications, interpolation tables, other equations, or any direct constant value can be combined into a mathematical calculation to produce real-time data that displays and records along with the rest of the test data. Channels 100 through 129 are dedicated equation channels. Additionally, any unused measured channel may be configured as an equation channel, although SuperFlow does not recommend creating them in channel blocks used for installed measured channels.

For instance, if a thermocouple module is installed in channels 13–28, do not make channel 25 an equation channel. However, if the thermocouple module was not installed, any or all of channels 13–28 could be used for additional equation channels. Any predefined equation channel may easily be modified using the configuration editor supplied with WinDyn.

The configuration editor can utilize any of the Extended Equation Language (EEQL (.CFA) (pronounced 'equal')) variables shown on the following page when creating equations.



Figure 1.9: Example Equation

Figure 1.9 above shows an example of a lengthy equation with extensive comment lines. Comments may be placed on their own lines in equations, or after a function. Comments are identified by the use of the double back slashes: //



Figure 1.8: Edit Equation Channel Window



Figure 1.10: CAN Channel, AEM Channels 29-36, Edit Equation Window



EEQL (.CFA)							
	(pronounced 'equal')						
<u>E</u> xtended <u>Eq</u> uation <u>L</u> anguage							
	Lexical Elements supported by .CFA files						
PUNCTUAT	TION						
Token	Function	Description	Example				
	Comment	Specify comment text	<pre>sin(0) //compute</pre>	trig sine			
()	Precedence	Override default precedence	1+2*3 = 7	(1+2) * 3 = 9			
()	Function input	Specify function input expression	abs (A+B)	(A+B) ^2			
;	Statement terminator	Specify end of a statement	return(A+B);				
,	Argument delimiter	Separate multiple function arguments	round(1.5,0)				
ARITHMET	IC OPERATORS (BINA	ARY)	English	Besult			
loken	Function	Description	Example	Result			
+	Add Subtract	Adds two expressions	1+1	2			
-	Subtract	Subtracts two expressions	1-1	0			
*	Divido	Divides two expressions	⊥*⊥ 1 /1	1			
	Evponentiate	Exponentiates expression	1/1	⊥ o			
ARITHMET		Exponentiates expression	2 3	0			
Token	Function	Description	Example	Result			
ABS	Absolute value	Absolute value of expression	abs(0-1)	1			
LERP	Interpolate	Linear interpolation of expression	lerp(A, Table1)	Run A thru table			
DOIND	Dound	Round expression to position n (0,1,2,etc.)	$r_{1}(1) = r_{1}(1)$	100 C			
ROOND	Round	Rounds up at >= 5, rounds down at < 5.	100110(123.55,1)	123.0			
TRIGONO	IETRIC FUNCTIONS -	Angles in degrees only					
Token	Function	Description	Example	Result			
SIN	Sin	I rigonometric sine of expression	sin(90)	1			
COS	Cosine	I rigonometric cosine of expression	cos(90)	0			
'I'AN	Tangent	Trigonometric tangent of expression tan (45) 1		1			
ASIN	Arcsine	Trigonometric arcsine of expression asin(1) 90		90			
ACOS	Arccosine	Trigonometric arccosine of expression acos (0) 90		90			
FLOW CON							
Operator	Function	Description	Example				
RETURN	Return expression	End program and return expression	return (EngSpd*Eng	aTra/HPD);			
MISCELLA	NEOUS FUNCTIONS			5			
Token	Function	Description	Example	Result			
RAW	Raw channel value	Value of channel (raw ADC units)	raw(EngTrq)	ADC of EngTrq			
CONSTAN	ſS						
Token	Function	Description	Value				
PI	pi	Value of pi to 15 digits of precision	3.14159265358979				
HPD	hp divisor	Divisor for horsepower calculation	5252.11312203255				
TRUE	true	boolean true	1				
FALSE	false	boolean false	0				
ON	on	boolean on	1				
OFF		boolean off	0				
Tokon	Eurotion	Description	Examples				
1	Number	A valid number (no decimal point)	1 12 123 1234	12345			
	Number	A valid number (with decimal point)	0.01 0.1 1 0	10.0 123.123			
1 0 F 1	Number	A valid number (scientific notation)	1e1 1E+1 1 0e-1	1 6.022E+23			
0x7F	Number	A valid number (hexadecimal)	0x7F 0X7FFF 0x7	ABCD 0X1234ABCD			
IDENTIFIER	RS - Only le <u>tters, num</u> l	pers, and underscores allowed. First ch	ar can't be <u>a number.</u>				
Token	Function	Description	Examples				
x	Identifier	A valid indentifier	x tmp EngSpd A	AirT4			
x1	Identifier	A valid indentifier	x1 tmp1 tmp2 t	tmp23			
1	Identifier	A valid indentifier	x 1 NO COMM	tmp 23			



The formula as it is in the configuration is shown next to the channel name in Table 1-4.

Channel	Units Of Measurement	Formula		
3 - TrqAbs	lb-ftA	return(abs(Trq1));		
Channel 3 is for calculating the absolute value of strain gauge torque. It allows bi-directional operation of the system				
20 - SpeedC	mph	return(RolFrq*0.0891);		
Channel 20 is a calculated speed channel for more low speed resolution. Uses 1/11.227 = 0.0891 for AD-30 coefficient.				
21 - Rv_mph	ratio	return(EngSpd/Speed);		
Channel 21 provides a ra	atio between engine	RPM and wheel speed.		
22 - Oil_T	deg F	return(lerp(OilTmp,AirTpT));		
Channel 22 is the equation	on to compute oil ter	np from sensor input.		
23 - LamAF1	ratio	return(Lambd1*Stoich);		
Channel 23 is for calcula AFR = Lambda*Stoich	ting air fuel ratio fror	n wideband O2 input. Set for Daytona WEGO wideband O2,		
24 - LamAF2	ratio	return(Lambd2*Stoich);		
Channel 24 is for calcula AFR = Lambda*Stoich	ting air fuel ratio fror	n wideband O2 input. Set for Daytona WEGO wideband O2,		
53 - MAP	kPa	return((Baro_P*3.386388)+(BoostP*6.894757));		
Channel 53 is a conversi	on channel to create	Manifold Absolute Pressure.		
54 - WatGrn	grains	return((7000*(18.02/28.85)) * (SatVap/((Baro_P*0.4911)-SatVap)) * (Humidy/100));		
Channel 54 is used to ca	lculate water grains	at current relative humidity and barometric pressure.		
55 - ADR	ratio	return((AirDen/0.0763) * 100);		
Channel 55 is used to ca 60 deg F, dry air, 29.92 ir	lculate air density ra hHg baroP.	tio. Ratio of current air density to standard sea level conditions,		
56 - InVald	null	return(0);		
Channel 56 is a place ho channel will be TRLTRQ	lder channel for con for Track Road Load	trol functions. Used as a second control channel. The third control simulation.		
57 - SatVap	psi	return((lerp(AirInT,VaporT)* 0.4911));		
Channel 57 calculates sa than combined with the v	aturation vapor press vater grains calc.	sure in psi. Recommend using this channel as an intermediary rather		
58 - DJWhTq	Clb-ft	return(DJWhPw*5252.113/EngSpd);		
Channel 58 is an "operator" corrected wheel torque value derived from channel 114 - DJWhPw. Uses the SAE J-1349 atmospheric correction applied to wheel power. Then multiplies by an additional "operator" selected multiplier. Defaulted to 1 10 or 10%				



Channel	Units Of Measurement	Formula		
59 - OptRPM	RPM	return((EngFrq*OpTPck)*60);		
Channel 59 calculates op	otical tach RPM. It is	used for computing ratios in the Eng_Spd test profile.		
60 - LoadP	%	return(Mem2/40.96);		
Channel 60 is the load percentage feedback from TDebug mem2 channel. Must turn ON TDebug Mem95 function for it to work. Mem95 = 2 for normal PID values, use 1 if looking for Track Road Load values. Mem95 can be set v test profile commands.				
61 - EngTrq	lbs-ft	return((EngPwr*HPD/EngSpd));		
Channel 61 calculates th	e uncorrected estimation	ated engine torque.		
62 - EngPwr	hp	return((WhIPwr+EsDTLs)*Mem1);		
Channel 62 calculates an estimate for uncorrected engine power by taking the measured wheel power and adding in an estimate of drive train losses during the acceleration part of the test. Those losses consist of the measured losses and a K_Fact adjustment. Added Mem1 multiplier to turn this channel ON/OFF. If Mem1 = 1, channel is ON. If Mem1 = 0, channel is OFF.				
63 - CEngTq	Clb-ft	return((CEngPw*HPD/EngSpd));		
Channel 63 calculates co default, this channel uses	orrected engine torqu s the SAE J-1349 co	ue based on corrected engine power and measured engine speed. By rrection formula.		
64 - CEngPw	Chp	return(((SAECor*WhIPwr+C_DLos+(SAECor*WhIPwr-C_DLos)*K_ Fact))*Mem1);		
Channel 64 calculates corrected engine power by correcting the wheel power numbers for atmospheric conditions. Coast down losses are not corrected as they are very weakly affected by air density changes. Very little of the measured coast down losses are aerodynamic (losses from air windage around rotating components). By default, this channels uses the SAE J-1349 correction formula. Added Mem1 multiplier to turn this channel ON/OFF. If Mem1 = 1, channel is ON. If Mem1 = 0, channel is OFF.				
65 - PwrDif	%	return((1-(WhIPwr/EngPwr))*100);		
Channel 65 calculates th Result is in percentage u	e percentage differe nits.	nce between measured wheel power and estimated engine power.		
66 - EsDTLs	hp	return(C_DLos+(WhIPwr-C_DLos)*K_Fact);		
Channel 66 estimates what the drivetrain losses were during the acceleration run. It is based on measured wheel power during the acceleration run as well as measured coast down loss power. The K-Factor is used to compensate for the torque dependent losses that are not completely measured during the coast down when the torque through the drivetrain of the vehicle is much less than what went through the drivetain during the acceleration run. The K Fact channel is used to "adjust" the final EngPwr value.				
67 - C_DLos	hp	return(lerp(speed,CstDnT));		
Channel 67 calculates the coast down power loss for use in printouts. It extracts data from the CstDnT table that is populated during a coast down function.				



Channel	Units Of Measurement	Formula					
68 - MeasCD	НР	return(InrPwr+DynLos+AbsPwr);					
Channel 68 calculates dr (Whllnr) that was set dur calculation more accurate placed into table 139. It from 122 to 68 to match	ivetrain power losse ing the test. It is imp e. If you do not know is later used to gene this channel number	s during coast down. It uses using the vehicle wheel inertia value ortant to have a relatively accurate wheel inertia value to make this or what to use for a car, use 125. This channel is then curve fit and rate an estimate of engine power. Low level setting must be changed					
72 - Lambd1	ratio	return((LamVt1*0.136)+0.680);					
Channel 72 calculates th Lambda = (VDC*0.136)+	e Lambda value fron 0.680.	n wideband O2 input one. Set for Daytona WEGO wideband O2.					
73 - Lambd2	ratio	return((LamVt2*0.136)+0.680);					
Channel 73 calculates th Lambda = (VDC*0.136)+	e Lambda value fron 0.680.	n wideband O2 input two. Set for Daytona WEGO wideband O2.					
74 - AirInT	deg F	return(lerp(AirSen,AirTpT));					
Channel 74 displays the The thermistor is located temperature for that volta power correction factors	air inlet temperature inside the humidity _l age from the channel and air density.	from the thermistor used for ambient air temperature measurement. probe. The voltage is measured by Channel 1, then retrieves the 136 interpolation table. The air temperature data is used to determine					
75 - AbsTmp	deg F	return(lerp(AbsSen,AirTpT));					
Channel 75 displays the cause for concern.	temperature at the e	ddy current absorber. Temperatures above 300 degrees F should be					
100 - WhlPwr	hp	return(InrPwr+DynLos+AbsPwr);					
Channel 100 is used to c strain gauge. No atmosp	alculate wheel powe heric correction is ap	r from inertia power plus dyno losses plus absorber power from the oplied.					
NOTE: The correction far generating performance one of these channels. T to reflect the proper corre	NOTE: The correction factors listed below are the default formulas provided by SuperFlow. WinDyn is capable of generating performance data corrected to any standard. All that is required is to change the name and formula in one of these channels. The channel names of the referenced channels (xxxPwr and xxxTrq) should also be changed to reflect the proper correction standard.						
101 - SAECor	factor	return(((459.7+AirInT)/536.7)^0.5*(29.23/ (Baro_P-Vap_P)));					
Channel 101 is used to calculate the Society of Automotive Engineers (SAE) J1349 power correction factor. It combines the ambient air temperature from channel 74 and the barometric pressure from channel 76 with the vapor pressure of the moisture of the air from channel 118. The ^0.5 value indicates a square root function. This factor estimates what the measured torque and power would be at 77° Fahrenheit [25°C] and 29.23 inches of mercury [99 kPa] air pressure. The SAE correction factor is used by channel 115, SAE Torque, to correct the wheel torque in channel 121							



Channel	Units Of Measurement	Formula			
102 - STPCor	factor	return(((459.7+AirInT)/519.7^0.5*(29.92/Baro_P-Vap_P)));			
Channel 102 is used to c uses the ambient air tem from channel 118 to calc would be at 60° Fahrenh is used by channel 116, 9	alculate the Standar perature from chann ulate a power correc eit and 29.92 inches STP Torque, to corre	d Temperature and Pressure (STP) J607 power correction factor. It el 74, the barometric pressure from channel 76, and the vapor pressure tion factor. This factor estimates what the measured torque and power of mercury barometric pressure <i>[15.5°C and 101.3 kPa]</i> . Channel 102 ct the wheel torque in channel 121.			
103 - Bf	coeff	return(lerp(VehNum,Bf_Tbl));			
Channel 103 is used to o vehicle # (type) is determ	alculate the Bf force nined by the lookup t	coefficient based off the PWR@50mph value entered in channel 79. A able and then a value is computed by the equation.			
104 - VehNum	#	return(lerp(Pwr_50,VehTbl));			
Channel 104 is used to c vehicle # (type) is determ	letermine the vehicle nined by the lookup t	type # based off the PWR@50mph value entered in channel 79. A able and then a value is computed by the equation.			
105 - DynLos	hp	return((lerp(Speed,DynLsT))*AirDen/0.0763);			
Channel 105 uses roll sp slightly modified by any o	eed to look up a los changes in air densit	s value (in hp) from the embedded system tables. That value is then y.			
106 - Af	Af coeff return((0.0425*(VehNum^3))-(0.8321*(VehNum^2))+(6.0267*(Veum))-0.6188);				
Channel 106 is used to o vehicle # (type) is determ	alculate the Af force nined by the lookup t	coefficient based off the PWR@50mph value entered in channel 79. A able and then a value is computed by the equation.			
107 - Cf	coeff	return((0.00007*(VehNum^3))-(0.0011*(VehNum^2))+(0.0056*VehN um)+0.013);			
Channel 107 is used to c vehicle # (type) is determ	alculate the Cf force nined by the lookup t	coefficient based off the PWR@50mph value entered in channel 79. A able and then a value is computed by the equation.			
108 - InrPwr	hp	return((Mem4+WhIInr)*Accel*Speed/375);			
Channel 108 is used to c rear wheel inertia mass.	alculate an inertia po Uses MEM4 for rolls	ower value from the accelerative forces applied to the total roll set and et inertia.			
109 - DstncF	feet	return(Mem5*5280);			
Channel 109 converts th	e distance in miles fr	om system channel Mem5 to feet.			
110 - DstncM	miles	return(Mem5);			
Channel 110 displays the reported distance in miles from system channel Mem5.					
111 - ElpsTm	111 - ElpsTm seconds return(Timer2);				
Channel 111 uses timer 2 precision adjustments, if	2, channel 211, to me desired. It is defaulte	easure elapsed time in seconds during a test profile. It allows decimal ed to hundredths of a second precision.			
112 - SAEPwr	Chp	return(WhIPwr*SAECor);			
Channel 112 takes the m correction factor to provid	leasured wheel powe	er from channel 100 and multiplies by the J-1349 atmospheric l power value.			



Channel	Units Of Measurement	Formula			
113 - STPPwr	Chp	return(WhIPwr*STPCor);			
Channel 113 takes the m factor to provide a correc	easured wheel powe ted wheel power val	er from channel 100 and multiplies by the J-607 atmospheric correction ue.			
114 - DJWhPw	Chp	return(SAEPwr*Corfac);			
Channel 114 an "operato to wheel power and then	r" corrected wheel p multiplies by an add	ower channel that uses the SAE J-1349 atmospheric correction applied litional "operator" selected multiplier. Defaulted to 1.10 or 10%.			
115 - SAETrq	Clb-ft	return(SAEPwr*5252.113/EngSpd);			
Channel 115 derives an a correction factor.	atmospherically corre	ected wheel torque value from the SAEPwr channel. Uses the J-1349			
116 - STPTrq	Clb-ft	return(STPPwr*5252.113/EngSpd);			
Channel 116 derives an a correction factor.	atmospherically corre	ected wheel torque value from the STPPwr channel. Uses the J-607			
117 - DenAlt	Feet	return(148300*(460+AirInT-17.34782*Baro_P+6.582028*Vap_P)/ (4.956534*(460+AirInT)-17.34782*Baro_P+6.582028*Vap_P));			
Channel 117 produces a	value in estimated d	lensity altitude used by engine tuners.			
118 - Vap P	InHg	return((lerp(AirInT,VaporT) * Humidy/100);			
Channel 118 calculates the contains the vapor pressing pressure from the table for channel 120, the percent pressure is subtracted from power correction factors. cannot be used directly be	he vapor pressure in ure for 100% relative or the air temperatur relative humidity to om the barometric pr Vapor pressure is th pecause it varies with	the air under the current test conditions. Interpolation table 137 e humidity at different air temperatures. The formula provides the vapor e measured in channel 74 (Air Temp). That number is multiplied by obtain the actual vapor pressure. In channels 101 and 102, the vapor ressure to determine the net barometric pressure to be used in the ne true measure of water vapor content of the air. Relative humidity n air temperature.			
119 - AirDen	lb/cft	return(0.0763 * BaroP/29.92 * 520/(460+AirInT));			
Channel 119 is used to calculate the air density under the test conditions. Air density is measured in pounds per cubic feet of air. The constant 0.0763 is the lbs/cubic foot of air at sea level. Channel 119 uses the barometric pressure from channel 76 and the air temperature from channel 74 to calculate the actual air density under test conditions.					
120 - Humidy	%	return(((HumSen-0.655)/2.54*100)/(1.093-(0.0012*AirInT)));			
Channel 120 takes the hi determine the percent re- the vapor pressure in the	umidity sensor voltag lative humidity of the air for power correc	ge input from channel 6 and combines it with the air temperature to air during the test. This data is then used by channel 118 to determine tion.			
121 - WhITrq	lbs-ft	return(WhIPwr*5252.113/EngSpd);			
Channel 121 derives an	uncorrected wheel to	orque value in lbs-ft from engine RPM.			



Table 1-4. Equation Channels

Channel	Units Of Measurement	Formula						
122 - Accel	g	return(Mem0/21.937);						
Channel 122 derives the Sec, which is then conve	rate of acceleration rted into G units her	in G units. Low level channel Mem0 produces an accel value in MPH/ e.						
123 - RolRPM	RPM	return(Speed*5280/60/29.94/3.1416*12);						
Channel 123 is used to c	alculate roll revolution	ons per minute. Uses 29.94" for AD-30 roll diameter.						
124 - TRLTRQ	lb-ft	return(Trq1);						
Channel 124 is the chann there is an AC motor and coefficient from the TRQ	nel Electrical Inertia I an Eddy Current str 1 channel for TRL to	Simulation (EIS) Road Load Controls to sum of load cells when rain gauge together. Must produce a positive value using a positive cal work properly. THIS MUST BE IN CHANNEL 124!!!!						
125 - EngSpd	RPM	return((lgnPck*EngFrq/Pul_Rv*60)+(((OpTPck*OptRPM)+(CalPck* RolFrq))*RPMRat));						
Channel 125 derives eng off portions of the equation input to channel 9 for cal hardware file must be se	ine speed from varion on, so only one signa culated method to w t for proper signal lev	bus inputs. Specification channels are used as switches to turn on/ al source is used at any one time. Requires a jumper from channel 10 ork. Typically, on a 2640 board, the jumper is between R79-R85. The vel, MAG or TTL. New systems use a Hall Effect, so use TTL.						
126 - AbsPwr	hp	return(TrqAbs*RoIRPM/5252.113);						
Channel 126 is used to calculate the absorber power in horsepower. It uses channel 3 - TrqAbs for 2WD AutoDyn systems instead of TRQ1 channel.								
128 - GrndTq	lbs-ft	return(WhIPwr*5252.113/RoIRPM/29.94*TirDia);						
Channel 128 is used to c and reflects true torque a	Channel 128 is used to calculate torque applied to the ground. Derived from uncorrected wheel power channel, and reflects true torque at the ground as affected by gear ratio and tire diameter. Must have a reasonably close tire							

diameter input to be accurate.



1.4.4 Interpolation Tables

Interpolation tables store non-linear functions for calibration and calculation purposes. They are typically used as calibration tables for air turbines, parasitic inertia tables for chassis dyno rolls, and correction factor tables. This feature is used to linearize a sensor or basically perform calculations from a set of arbitrary data. Tables can be defined with fixed interval or variable interval input values. The interpolation tables are located in channels 130 through 139.

Interpolation Channel 130 - VehTbl

Channel 130 is an interpolation vehicle number look-up table used to compute Af, Bf, and Cf values based on vehicle Pwr@50mph. Operator enters in the Pwr@50mph value and the table selects the vehicle number, 1-15. Used in the Track Road Load





simulation. The Input(x) is in HP units. The Output f(x) column, is a vehicle number used in the equations.



Figure 1.12: Channel 130 Values



Interpolation Channel 132 - DynLsT

Channel 132 is a dyno loss interpolation look-up table in power units. It uses POWER values. This table is used for TRLTRQ calcs and the DynLos channel. The input is in MPH units. The output is in HP units. User must enter correct values in the table from the SuperFlow calibration sheet for their dyno. Typically, this is done by SF at time of dyno production

🔳 DynLs	Г											×
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat											
🖌 X	Number points: 21	1,2,3 +.0 .00	-	B)								
Point	Input - x	Output - f(x)										
1	0.0000	0.0000										_
2	10.000	0.0000										
3	20.000	0.0000										
4	30.000	0.0000										
5	40.000	0.0000										
6	50.000	0.0000										
í o	60.000	0.0000										
0 0	10.000	0.0000										
10	90.000	0.0000										
11	100.000	0.0000										
12	110.00	0.0000				•	•					
13	120.00	0.0000	-									
14	130.00	0.0000										
15	140.00	0.0000										
16	150.00	0.0000										
17	160.00	0.0000										
18	170.00	0.0000										
19	180.00	0.0000										
20	190.00	0.0000										
21	200.00	0.0000										
			0	20 4	0 60	80	100	120	140	160	180	200
Total: 21	Selected: 1											

Figure 1.13: Channel 132 Values



Interpolation Channel 133 - Bf_Tbl

Channel 133 is an interpolation look-up table containing values used to compute Track Road Load simulation Bf values based on vehicle Pwr@50mph. Operator enters in the Pwr@50mph. A table selects the vehicle number, 1-15, which is then applied here to compute the appropriate Bf value.

■ Bf_Tb	l		
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat		
🗸 X	Number points: 16	1,2,3 +.0 .00 +.0	🛉 🐴 🕒
Point	Input - x	Output - f(x)	
1	0.0000	0.0000	
2	1.0000	0.1100	0.55
3	2.0000	0.1100	0.5
4	3.0000	0.0800	
5	4.0000	0.0800	
ь 7	5.0000	0.3400	0.4
8	7 0000	0.1800	0.35
9	8,0000	0.0700	
10	9.0000	0.2000	0.5
11	10.000	0.2800	0.25
12	11.000	0.4800	0.2
13	12.000	0.0100	0.15
14	13.000	0.5700	0.13
15	14.000	0.1100	0.1+/
16	15.000	0.1300	0.05
			0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Total: 16	Selected: 1		



NOTE:

The output values are typical and come from EPA testing.



Interpolation Channel 136 - AirTpT

Channel 136 is an interpolation look-up table to convert the voltage from the air temperature sensor in channel 1 into actual temperature for channel 74.

🔲 AirTpT	Г		
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat		
🖌 🖌 🗙	Number points: 21	1,2,3 +.0 .00 .00 +.0	
Point	Input - x	Output - f(x)	
1	0.0330	300.20	300 +
2	0.0860	230.00	290
3	0.1140	212.00	200
4	0.1520	194.00	260
5	0.2060	176.00	240
6	0.2820	158.00	220
7	0.3640	144.80	200
8	0.4590	131.60	180
9	0.5820	118.40	100
10	0.7380	105.20	160
11	0.9350	92.001	140
12	1.1780	78.801	120
13	1.4710	65.594	100
14	1.8080	52.400	80
15	2.1780	39.200	
16	2.5580	26.000	60
17	2.9220	12.800	40
18	3.2450	-0.4000	20
19	3.5100	-13.600	0
20	3.7120	-26.800	20
21	3.8570	-40.000	-20
Total: 21	Selected: 1		p

Figure 1.15: Channel 136 Values



Interpolation Channel 137 - VaporT

Channel 137 is an interpolation look-up table to determine the vapor pressure at 100% relative humidity (saturation vapor pressure) for the dry bulb temperature. The input is in temperature units in deg. F. The output is in vapor pressure units, inHg. This table is used in channel 118.

IVapor	Г														×
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat														
🗸 X	Number points: 21	1,2,3 +.0 .00 +.0 +.0	•	B											
Point	Input - x	Output - f(x)													
1	0.0000	0.0400												· · ·	_ ,
2	10.000	0.0700	23				ll I I I I ll				d 		·! ·		1
3	20.000	0.1100	21				!!								4-
4	30.000	0.1600	20									++-		÷	f
5	40.000	0.2500	19-			+									
6	50.000	0.3600	18				!!							1	
7	60.000	0.5200									 	J		/	
8	70.000	0.7400	15											/	
9	80.000	1.0300	14										/	÷	
10	90.000	1.4200	13										1	÷	
11	100.00	1.9300	12+				!!					1	1		
12	120.00	2.5300	''I									1.1			
13	120.00	4 5200	9											ļļ	
15	140.00	5 8700	8									/		÷}	
16	150.00	7.5500	7								1	1		111	
17	160.00	9,6299									/			1	
18	170.00	12.180	4								·			ļļ	
19	180.00	15.270	3							×				÷	
20	190.00	18.990	2			1								t	
21	200.00	23.450				· · · · · · · · · · · · · · · · · · ·		.							
			Ó	10 2	30 4	40 50	60 70	80 90	100 110	120 13	0 140 1	50 160	170 1	80 190	0 200
Total: 21	Selected: 1														

Figure 1.16: Channel 137 Values



Interpolation Channel 138 - AbsTab

Channel 138 is an interpolation look-up table to determine the absorber temperature. It is a curve fit table for the absorber temp sensor.

🔳 AbsTa	b						_ 🗆 🗙
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat						
🖌 🗸 🖌	Number points: 21	1,2,3 +.0 .00 .00 +.0	-	₽			
Point	Input - x	Output - f(x)					
1	0.0050	482.00					
2	0.0060	460.40	480 1				
3	0.0070	437.00	460 1			1	
4	0.0090	415.40	440			1	
5	0.0110	392.00	400-			 	, , , , , , , , , , , , , , , , , , ,
6	0.0140	370.40	380-				
7	0.0180	347.00	360-				
8	0.0240	325.40	340				
9	0.0320	302.00	320				
10	0.0430	280.40	300	•			
11	0.0590	257.00	280	•			
12	0.0810	235.40	260	•			
13	0.1170	212.00	240	•••			
14	0.1680	190.40	220			 	
15	0.2060	145 40	200 -				
17	0.3000	118 40	180 -	···· `			
18	0.3820	105 20	160-		•		
19	1 1780	78 801	140+				
20	1.8080	52,400	100		•		
21	2.1780	39.200	803				
			60-				
			40	,		+	
						1	2
Total: 21	Selected: 1						

Figure 1.17: Channel 138 Values



Interpolation Channel 139 - CstDnT

Channel 139 is an interpolation look-up table which contains the power absorbed by the vehicle during a coast down. The values are curve fit from coast down data to smooth out irregularities in the data that may occur at the beginning of the test. The dyno and the vehicle will often times experience a torsional vibration that may take a second or two to become damped when the clutch is suddenly pushed in. This data is only used in the engine power calculations. The data is derived from the MeasCD channel, which is in Hp units.

🔳 CstDn	Т													×
<u>T</u> able <u>E</u> dit	<u>I</u> nsert <u>F</u> ormat													
🗸 X	Number points: 21	1,2,3 +.0	.00 • •	•	₿									
Point	Input - x	Output - f(x)												
1	0.0000	0.0000												
2	10.000	0.0000												
3	20.000	0.0000												
4	30.000	0.0000												
5	40.000	0.0000												
6	50.000	0.0000												
7	60.000	0.0000												
8	70.000	0.0000												
9	80.000	0.0000												
10	90.000	0.0000												
11	100.00	0.0000		0		• • • •	• • •	• •	• •	• • •	• • •	• •	• •	• •
12	110.00	0.0000												
13	120.00	0.0000												
14	130.00	0.0000												
15	140.00	0.0000												
16	150.00	0.0000												
17	160.00	0.0000												
18	170.00	0.0000												
19	180.00	0.0000												
20	190.00	0.0000												
21	200.00	0.0000		<u> </u>					402	420	440	400	400	
				U	20	40	60	80	100	120	140	160	180	200
Total: 21	Selected: 1													

Figure 1.18: Channel 139 Values

NOTE:

The input is in MPH units. The output is automatically populated when a coastdown is performed. However, the data will not show up in the .cfx file. It is stored in system memory in the sensor box until the sensor box is powered OFF.



1.4.5 System Channels

System channels are pre-programmed channels that supply important information to WinDyn. The following descriptions lists the system channels and their functions. System Channels can be read and displayed in the same manner as data channels and can be used as operators in calculated channels. System channels cannot be modified or used for closed loop control.

Channel	Name	Description
200	Time_H	Displays the current hour from the system clock* (see note below)
201	Time_M	Displays the current minute from the system clock
202	Time_S	Displays the current second from the system clock
203	SecDay	Displays the number of seconds since midnight
204	TsTime	Not used.
205	RnTime	Not used.
207	SetPt1	Channel 207 is the load set point used by the absorber control system. A value in this channel indicates the control set point being used. The value changes depending upon the control channel being used. If control is manual, then the value represents a percentage of load from 0-100%. If the control is to vehicle speed, then the value indicates mph control point from 0–225 mph. If the control is to TRLTRQ, then the value represents a Track Road Load Torque.
208	SetPt2	Channel 208 is the throttle set point used by the optional electronic throttle control system. A value is this channel indicates the control set point being used. The value changes depending upon the control channel being used. If control is manual, then the value represents a percentage of throttle from 0-100%. If the control is to engine speed, then the value indicates an rpm control point from 0-20,000 rpm. This channel is not typically used on chassis dynamometers.
210	Timer1	Channel 210 is a system timer channel. This channel is typically used in test profiles to indicate the total time a test is running. It uses tenths precision.
211	Timer2	Channel 211 is a system timer channel. This channel is typically used in test profiles to indicate ramp time or the time during which the data is collected during a test. It uses thousandths precision.
212–218	Timer3 to Timer9	Used by the autotest to monitor timing functions. The timers are not user accessible. See the Test Profile editor in the WinDyn Users Guide for details
219	SpcGv2	Not used in current SuperFlow systems
220	Memry0	Channel 220 is acceleration in mph/second. It is used by Channel 122 to calculate acceleration.
221–222**	Memry1 & Memry2	Memory 1 (channel 221) used in test profiles to turn ON/OFF the engine power equations. Memory 2 (channel 222) is used when TDEbug is turned ON.
223	Memry3	Channel 223 is used to hold the total number of data lines recorded.
	-	1

Table 1-5. System Channels

* WinDyn will synchronize the computer clock with the clock in the data acquisition system. The system time/ date channels (200-203 & 232-235) are linked to the computer clock when WinDyn connects with the system.



Channel	Name	Description
224	Memry4	Contains chassis dyno system inertia value in Lbs. units.
225	Memry5	Display miles traveled on chassis dyno systems. May be reset via TPF commands.
226–227**	Memry6 to Memry7	Used when TDEBug, MEM95 is turned ON.
228**	Memry8	Used when TDEBug, MEM95 is turned ON.
229**	Memry9	Used when TDEBug, MEM95 is turned ON.
230	Memr10	Channel 230 used to hold the total number of data lines recorded.
231	LineNo	Channel 231 is a system channel which indicates the line number of the data line recorded in a test data file (.sfd). It can also be used when recording raw data at 100 times per second as a 1/100th second timer channel.
232	Year	This channel specifies the year when a data line is recorded in a test. This information is a permanent record of the test execution date and cannot be changed.
233	Month	This channel specifies the month when a data line is recorded in a test. This information is a permanent record of the test execution date and cannot be changed.
234	Day	This channel specifies the date when a data line is recorded in a test. This information is a permanent record of the test execution date and cannot be changed.
235	DayWk	This channel specifies the day of the week when a data line is recorded in a test. This information is a permanent record of the test execution date and cannot be changed. Day of week (0-7 = Sun-Sat)

** Memory 2, 6, 7, 8, and 9 have special functions due to MEM95=2 in TPF's. They report PID information about the control system.

NOTE: On some systems, channels 140-171 may be defined as thermocouple inputs or CAN channel inputs. They will have hard coded definitions which <u>cannot</u> be modified by the end user.

