Glossary

A

ABS
Anti-lock Braking System - A system which prevents individual wheel lockup by monitoring individual wheel speeds. The braking at each wheel is regulated by a series of electronically controlled valves which regulate the brake pressure. If the system detects an impending lockup at any wheel, the brake pressure is pulsed to prevent lockup. This enables the vehicle to be controlled during panic braking situations. This system has been on all BMW models since 1986 and is now incorporated into the DSC system. ABS systems are manufactured for BMW by Bosch and Teves.
*(German: **A**nti**b**lockier**s**ystem)*

ACC
Active Cruise Control - ACC is an enhanced cruise control system consisting of a front mounted radar sensor which is used to detect vehicles traveling ahead in the traffic lanes. The radar sensor is connected to the PT-CAN bus and communicates with the DME and DSC. This system communicates with throttle and braking systems to keep a specified distance (by time) between vehicles. Currently, this system is available as an option on all E6X vehicles.

Active Safety
This is a design philosophy which assists the driver in avoiding potential accidents. Any system which helps the driver retain precise control of the vehicle can be part of the overall active safety design. Systems such as DSC or ABS is conjunction with steering and suspension systems can assist the driver in actively avoiding a dangerous situation. Also any system which helps the driver to maintain attention on the road can also be a part of the active safety philosophy. The RLS, driving lights, AHL are some of the systems that become important during traffic and adverse environmental conditions.

A/D
Analog to Digital - This is method of converting analog signal into digital information which allows electronic information to be shared electronically between processors.

AFS
Active Front Steering - This system consists of an electronically controlled steering rack that incorporates a planetary gear set which allows a continuously variable steering ratio. The system consists of a special steering rack, control module and support electronics which are connected to the F-CAN. AFS is currently installed as an option on the E60, E63 and E64. The new 3 series (E90) will utilize AFS as well.
(Note: as of 2005, AFS will be referred to as AS (US) or AL (German: Activ Lenkung)

AHPS
Advanced Head Protection System - This system consists of a tubular airbag similar to ITS but with the addition of a fabric sail. This sail adds additional protection by retaining the occupant during a side impact and shielding the occupant from debris and glass splinters. AHPS II protects the rear passengers in addition to the front passengers.

AIC
Automatic Interval Control - This is an intermittent wiper system which is dependent upon input from a rain sensor. The rain sensor uses the principle of refraction to determine the rain intensity. The rain sensor is connected to the relevant bus system (K-bus) and sends rain intensity information to the body electronics which in turn controls the wiper interval. The wiper interval is also based on sensitivity input from a control knob mounted on the wiper stalk switch. AIC has been in use since 1999 and was subsequently installed on all BMW models. *(German:**A**utomatic **I**ntervall **C**ontrol/Regensensor)*

AITS
Advanced Inflatable Tubular Structure - See AHPS

AKS
Active Head Restraint System - This system which is used on the E65,E66 and E60 reduces the risk of cervical vertebrae injuries (whiplash). It consists of a deployable headrest which reduces the distance between the occupants head and the headrest. *German: **A**ktive **K**opf**s**tütze)*

ARS
Active Roll Stabilization - ARS is a part of the dynamic drive systems introduced on the E65/E66. The system consists of hydraulically controlled stabilizer bars that are controlled via the ARS module. ARS is designed to minimize body roll during turns. ARS is also now available on the E60, E63 and E64. *(German: **A**ktive **R**oll**s**tabilisierung)*

ASE
Advanced Safety Electronics - This is a ***byteflight*** based passive safety system which is based upon the ISIS network on the E65/E66. Introduced on the E85, it was modified for use on the E60, E63 and E64.

ASK
Audio System Controller - This is the primary audio system controller used on the E65/E66. It is an connected to the MOST bus and acts as the main controller for the audio system and the MOST bus. *(German: **A**udio-**S**ystem-**K**ontroller)*

AWL
Airbag Warning Lamp - The AWL is a visual indicator for for faults related to passive safety systems. It is used on all vehicles equipped with SRS/Passive safety systems. It is located in the instrument cluster.

B

BLS
Brake Light Switch - The brake light switch is used as an input to brake related systems such as ASC/DSC. It is also used to actuate the brake lights as well as to control the shift lock. *(German: **B**rems**l**icht**s**chalter)*

BMW
*Bavarian Motor Works (German: **B**ayerische **M**otoren **W**erke)*

BST
Battery Safety Terminal - This system is used to isolate (disconnect) the main battery terminal connection during an impact. It is a pyrotechnic device which protects the main battery cable from short circuits by disconnecting the battery during moderate to severe impacts. *See Also SBK*

byteflight
The ***byteflight*** is a fiber optic bus network designed for use with passive safety systems. It is comprised of a star structure which uses a centrally located module (SIM/SGM) with a series of satellites arranged in a radial pattern around the central module. ***byteflight*** can be found on vehicles equipped with ISIS or ASE. The byteflight bus is also referred to as the SI (Safety and Information Bus) Bus.

BZM
Center Console Control Center - This BZM is on the K-CAN on the E65/E66. It provides a connection between the i-Drive controller and the K-CAN. The BZM does not have any control over the I-Drive or controller functions. The seat adjustment and seat heater switches are also connected to the BZM. *(German: **B**edien**z**entrum **M**ittelkonsole)*

C

CAN
Controller Area Network - This is a bus system which uses a high speed two-wire configuration. This bus is capable of transferring data bi-directionally at a rate of up to 500kbps. Originally introduced on 1993 models for use on powertrain related systems, the CAN bus has evolved into body electronics systems as well. Some of the new CAN bus systems are K-CAN, PT-CAN and F-CAN.

CIP
Coding Individualization and Programming - Beginning with the E65. a new method of coding and programming was introduced. It consists of an FA (Vehicle Order) code which is used to determine the level of equipment installed on the vehicle. CIP allows for easy software upgrades as well as individualization of vehicle features.

D

DISA
Differential Intake Air Control - The DISA system provides for a variable intake runner length. The first use of DISA was on the M42B18 engine. There have been numerous variants of DISA since introduction. The variable intake provides for low RPM torque when needed as well as high torque in the upper RPM range.
*(German: **Di**fferenzierte **Sa**uganlage)*

DSC
Dynamic Stability Control - This is a system which monitors various vehicle inputs such as wheel speed, yaw rate, braking input to dynamically control braking and throttle systems. It can assist in correcting for oversteer and understeer situations. DSC consists of a hydraulic unit and pump along with an electronic control module. There are several variations of this system depending upon vehicle application. The systems are primarily supplied by Bosch and Teves. *(German: **D**ynamische **S**tabilitäts **C**ontrol)*

DTC
Diagnostic Trouble Code - As per SAE J1930 terminology, the term DTC replaces the former term fault code or trouble code etc.

DTC
Dynamic Traction Control - DTC is a sub-function of DSC. The DTC function can be activated with the DSC button and provides two subfunctions. They two subfunctions are the “sports tuning” of the Automatic Stability Control (ASC) and the Dynamic Stability Control (DSC) and improved traction, particularly on ground surfaces with a low coefficient of friction.

E

EBV
Electronic Brake Force Distribution - This is one of the DSC sub functions which allows for equal brake force distribution on turns while braking to compensate for weight shifts and unequal suspension loads. *(German: **E**lektronische **B**remskraft**v**erteilung)*

ECO
Electronically Controlled Orifice - This refers to the ECO valve used in conjunction with the Active Front Steering System (AFS). This provides for additional power steering fluid flow for the AFS when needed. It is part of the power steering pump and is electronically controlled by the SGM.

EDC
Electronic Damper Control - The EDC system is designed to provide variable damping of the shock absorbers during changes in road conditions. The system consists of a main control unit, shock absorbers (struts) with solenoid valves, a series of acceleration sensors and input from the steering angle sensor.
*(German: **E**lektronische **D**ämpfer **S**teuerung)*

EHC
Electronic Height Control - EHC provides for a variable rear height control to compensate for vehicle loading to maintain proper rear camber settings. The system uses a pneumatic pump with a pair of rear air springs. The system also uses rear height sensors to monitor the ride height which are an input to the EHC control module. This system is used exclusively on the E39 Sportwagon, the E53 X5 and the E65/E66. There is also a dual axle version (EHC II) which is offered as an option on the X5.
*(German: **E**lektronische **H**öhenstands **C**ontrol)*

EKP
Electric Fuel Pump - Any electric fuel pump is referred to as EKP. For example, The EKP relay is the fuel pump relay. In addition, some fuel pumps are variable speed controlled by an EKP module. Vehicles such as E46 M3 use a variable speed fuel pump based on various inputs from DME. *(German: **E**lektrische **K**raftstoff**p**umpe)*

EML
Electronic Motor Load Regulation - EML is electronically controlled throttle system. Originally introduced on the M70B50 (V-12) engine, the system has been modified for use on subsequent BMW models. As of 1999, all engines on BMW vehicle were equipped with some form of electronic throttle control. Although all of the other engine use a form of EML there are numerous differences in terminology. To reference the other systems, see the glossary definitions for MDK, EDK and EDR.
*(German: **E**lektronische **M**otor**l**eistungsregulierung)*

EWS
Electronic Driveaway Protection - EWS is designed to prevent the vehicle from starting by using a electronically coded ignition key. The key contains a electronics identification code which is changed each time the vehicle is started. There have been numerous versions of this system which have been in use in BMW models since the 1994 model year.
*(German: **E**lektronische **W**egfahr**s**perre)*

F

FA
Vehicle Order - The vehicle order is an “electronic list” of options which is electronically stored within the vehicle. The FA code is used by CIP to determine equipment levels and optional systems to facilitate coding and programming processes.
*(German: **F**ahrzeug-**A**uftrag)*

FB
Functional Description - When looking up electrical schematics in the diagnosis program (DISplus/GT-1), the FB is used to determine the function and operation of the relevant system. As of 2003, the FB has been replaced by SBT (Service Bulletin Technical) which can be found in WebTIS. *(German: **F**unktions**b**estätigung)*

F.I.R.S.T.
Fully Integrated Road Safety Technology - This is the corner stone behind BMW’s safety philosophy. This strategy is used by BMW to develop all safety related systems. This technology consists of various active and passive safety features designed to help the driver avoid accidents as well as protect the occupants in the event of an unavoidable accident.

G

GPS
Global Positioning System - GPS is a system of used to determine an exact position on the Earth. The GPS system is capable of reading positioning data transmitted by a series of geosynchronous satellites. GPS work in conjunction with other vehicle systems to create a system allowing the customer s to view a road map and a series of audible and visual prompts to locate a specific location or address.

GM
General Module - The general module is the main controller of the Central Body Electronics system (ZKE). This module is responsible for power locks, windows, wiper/washers, interior lighting etc. The GM is part of ZKE versions I, II III, IV and V. Depending upon application, the GM is also an integral part of the various bus systems in use. For example, the GM on the ZKE III system is the main controller for the P-bus and provides a gateway between the P-bus and K-bus. *(German: **G**rund**m**odul)*

GRAV
GRAV refers to the lightweight front construction concept introduced on the E60. GRAV is comprised of using lightweight aluminum materials for the chassis construction. Specifically from the bulkhead forward. GRAV is also used on the new 6 series as well.
*(German: **G**ewichts**r**eduzierter **A**luminium**v**orderbau)*

H

HDC
Hill Descent Control - This system, which is used on vehicle which have AWD such as the E46iX, E53 and E87, allows for controlled descents on steep inclines. HDC regulates brake and throttle to allow the driver to concentrate on steering the vehicle rather than focusing on brake and throttle controls. There is a console mounted activation switch which activates the system only if a specified criteria is met.

HFM
Hot Film Air Mass Meter - This is a form of air mass meter which uses a heated film rather than the previous hot-wire arrangement on the HLM. The primary benefit of this type of air mass meter is the elimination of the burn-off circuit. The surface area of the hot film is not prone to effects from contamination, therefore the burn-off cycle is not needed. HFM was introduced with the M60 engine in 1993 with DME version M3.3 and has been in use since. *(German: **H**eiß**f**ilm-Luft**m**assenmesser)*

HLM
Hot Wire Air Mass Meter - This type of air mass meter was the successor to the "vane type" airflow meter in use for years with various versions of engine management. The HLM uses a hot-wire to measure air mass. This is done by monitoring the amount of current required to maintain the hot-wire at a specific temperature. Due to the potential contamination of the hot wire from airborne contaminant's, the wire is heated to a high temperature after engine shutdown to clean the wire before the next startup cycle. The HLM was used on vehicles equipped with Bosch LH -Jetronic a.k.a. DME M1.2 and M1.7 systems. *(German:**H**itzdraht **L**uft**m**assenmesser)*

HPS
Head Protection System - This system consists of an Inflatable Tubular Structure (Head airbag) used to protect occupants head in the event of a side impact. HPS is an integral part of the BMW passive safety systems. (see also ITS)

HUD
Heads Up Display - This system projects a display on the windshield which provides the driver with information such as vehicle speed etc. Originally introduced on the E63 and E64, this system is also currently available on the E60.

I

IBS
Intelligent Battery Sensor - The IBS is a mechatronic intelligent battery sensor with its own microcontroller. The IBS is connected to the negative battery terminal and is used to measure battery terminal voltage, discharge/charge current and battery (electrolyte) temperature. The information collected by the IBS is used to determine battery SoC and SoH. This information is sent to the DME via the Bit Serial Data interface (BSD). *(German: **I**ntelligenter **B**atterie**s**ensor)*

IKE
Instrument Cluster Electronics - The IKE is the processing electronics located in the instrument cluster. The high version instrument cluster used on the E38, E39 and E53 contains the IKE. The instrument cluster used on these vehicle (except base kombi) is a display unit and performs no processing functions. The IKE contains all of the processing electronics. The early version IKE was attached to the back of the instrument cluster and connected by a ribbon cable. On later versions, the IKE was integrated into the cluster housing. *(German: **I**nstrumenten**k**ombination-**E**lektronik)*

ISIS
Intelligent Safety Information System - This is a passive safety system which is used on the E65/E66. It uses the ***byteflight*** fiber optic bus system.
*(German: **I**ntelligentes **S**icherheits- und **I**nformations-**S**ystem)*

ISN
Individual Serial Number or *Individual Control Unit Number* - The ISN is a signal which is transferred between the DME and EWS systems. This is a "coded" signal which allows the vehicle to be started. If the correct key is not inserted into the ignition, the EWS module will not send the ISN which will not allow spark and fuel injection to occur. The ISN is stored in both the DME and EWS module. When changing either of these modules, the ISN must be transferred electronically to the new module using the DISplus or GT-1. Failure to do so will prevent the engine from starting. Later models, (from 1999) use a "rolling code" ISN which is dedicated to both the DME and EWS modules. This prevent modules from being swapped between vehicle which further enhances the security of the EWS system. *(German:**I**ndividuelle **S**teuergeräte-**N**ummer)*

ITS
Inflatable Tubular Structure - This is a tubular shaped airbag which is part of the HPS (Head Protection System). It is designed to provide the vehicle occupants with head protection during side impacts. When deployed the ITS emerges from the roof panel trim and stretches across from the A to B pillar at head level.

J

K

KBM
Body Basic Module - The KBM is the primary control module for the body electronics on the E60, E63 and E64. The KBM has the responsibility for the power windows, locks, windshield wiping/washing, interior lighting and the consumer shutdown. Located behind the glove box, the KBM communicates with other vehicle systems via the K-CAN. ***(German: K**arosserie-**B**asis-**M**odul)*

Kombi
The term Kombi literally means "cluster" in German language, it is a short version of the word "Instrumenten**kombi**nation". It refers to the instrument cluster.

L

LCM
Lamp Check Module - This is the main controller for the exterior lighting on the E53, E38 and E39. This module combines the electronics for lamp control as well as the check control system. This term should not be confused with LKM *(German: **L**amp **K**ontrol **M**odul)*. The LKM was used on earlier vehicles (E31, E32 and E34) for exterior lighting control only.

LDP
Leak Diagnosis Pump - This is an engine vacuum controlled pump used to detect evaporative emission leaks. The LDP was used on vehicles with MS42, M5.2.1 to meet OBD requirements for evaporative leak detection.

LED
Light Emitting Diode - An LED operates like any other diode. It only passes current in one direction. But when forward biased, it will emit light. LED's are used on numerous systems on BMW vehicles. Mostly as indicators on switches and controls.

LEV
Low Emissions Vehicle - LEV is an emission standard created by CARB/EPA. The LEV standard reduced vehicle emissions by 70% and was part of the 1998 vehicle standards.

LIN
Local Interconnect Network - The LIN bus is a serial communications bus used in the automobile industry. LIN is a single wire, bi-directional bus which used a main controller and several server units. It can communicate at a rate of 19.2 Kbps., but most BMW applications communicate at 9.6Kbps. Currently the LIN bus is used on the E60, E63 and E64 for systems such as IHKA, AHL and the SBFA. Also, the E46 has adopted the LIN bus for AHL and mirror operation.

LL
Idle or Closed Throttle Position - This term is used in various diagnostic programs. It is usually seen in the status requests and refers to the position of the throttle. In this case, LL stands for the German term - "**l**eer**l**auf "or idle.

LRE
Steering Wheel Electronics

LSE
Steering Column Electronics

LSZ
Light Switching Center - This is the primary controller for the exterior lighting on the E46. It is connected to the K-bus and provides the lamp control and check control functions. *(German: **L**icht**s**chalt**z**entrum)*

M

M-ASK
Multi-Audio System Controller - The M-ASK is used as the main controller for the audio systems on the E60, E63 and E64. It is connected to the MOST bus and provides a gateway to K-CAN. The M-ASK contains the ASK, aerial amplifier/tuner and the MOST CAN gateway. (German:**M**ulti-**A**udio-**S**ystem-**K**ontroller)

MBC
Maximum Brake Control - MBC is a sub-function of the Dynamic Stability Control system. The MBC function is designed to support driver initiated braking by building up pressure in the rear brake circuit when the front wheels are already in ABS regulation. The additional braking pressure is designed to bring the rear wheels up to the ABS regulation point shortening the stopping distance. MBC is mainly effective when the rear of the vehicle is fully loaded. The MBC function is triggered when the brakes are applied more slowly than the threshold needed for a DBC regulation.

MDK
Motorized Throttle Valve - The MDK is an electronically controlled throttle system used on the MS42.0 engine electronics. It is a derivative of the original EML but is controlled directly by the ECM with no separate control module required. The MDK is a self contained unit which houses the electronic throttle motor, PWG and feedback potentiometers. *(German: **M**otorische **D**rossel**k**lappe)*

MID
Multi Information Display - The MID is used on the E38, E39 and E53. It acts as a display and provides controls for the audio system and BC functions. The MID performs no calculations but only a means of display and input functions. It is connected to the I/K bus.

MOST
Media Oriented System Transport - The MOST bus is a fiber optic network, used to carry data, voice, audio and video signals. It has a data rate of 22.5 Mbps. MOST was introduced on the E65/E66 and is now currently used on the other E6x vehicle. Future applications include the E90 and E91.

MRS
Multiple Restraint System- Starting with the E39 in 1997, the Multiple Restraint System was the new generation of passive safety systems which brought side impact airbags along with other subsequent innovations to the BMW model line.
*German: **M**ehrfach-**R**ückhalte**s**ystem)*

MRSA
Side Impact Sensor - used on MRS systems, this sensor is used to detect side impacts. It is installed in a lateral direction near the b-pillar.

MSR
Deceleration Slip Regulation or Engine Drag Torque Reduction - This is a sub-function of ASC/DSC designed to limit wheel slip during deceleration on low-friction surfaces such as ice, snow leaves etc. This system limits slip by increasing idle speed and advancing ignition timing during deceleration when wheel slippage is detected.
(German:**M**otor**s**chleppmoment**r**egelung)

N

NVRAM
Non-Volatile Random Access Memory - This is a random access memory which is not affected by the loss of battery voltage. NV-RAM is used to store fault codes on most new systems.

O

OBC
On Board Computer - The OBC is a driver information computer used to calculate fuel consumption, fuel tank range, outside temperature etc. It has been used in numerous applications over the years. Also referred to as “board computer” or BC, these BC functions are still used on many current BMW vehicles.

OBD
On Board Diagnostics - OBD is a standard set forth by CARB/EPA to standardize engine management diagnostics. The current OBD standard a.k.a OBD II requires a standard diagnostic connector for all vehicle manufacturers as well as a standardized fault code list.

OC-3
Occupant Classifier-3 - This is a new version of the SBE system which is designed to determine the approximate weight and size of the passenger. This system detects the contact pattern of the occupant to determine whether or not to deploy the front passenger airbag (and side airbag). This system is currently found in the E60 and E83.

OPPS
Optic Testing and Programming Systems - This is a modified diagnostic head used to expedite programming procedures. OPPS also for checking the MOST bus and byteflight fiber optic systems via separate adapter cables. The OPPS contains software and hardware to check to attenuation of fiber optic signals.
*(German: **O**ptisches **P**rüf- und **P**rogrammier**s**ystem)*

OPS
Optic Programming System - This provides the same capabilities as OPPS but without the hardware and software for checking the attenuation of the ***byteflight*** bus.

ORVR
On Board Refueling and Vapor Recovery - This is a system which allows for excess vapors to be contained during vehicle refueling. This system is a part of the OBD II emission standards.

P

PDC
Park Distance Control - The PDC system consists of a series of sonar sensors mounted on the front and/or rear bumper of the vehicle. The sensors sense the distance of other vehicles or obstructions when parking. The sensor send a signal to the PDC module which triggers and audible signal to determine the distance between the vehicle and the potential obstruction. This information allows the driver to judge distances during parking maneuvers.

PTC
Positive Temperature Coefficient - PTC refers to a resistance element such as a thermistor in which the resistance properties are proportional to temperature. In the case of a PTC thermistor, the resistance will increase as temperature increases. This is in contrast to an NTC thermistor in which the resistance will decrease when temperature increases.

PuMA
PuMA

*(German: **P**roblem- **u**nd **M**aßnahmenmanagement **A**ftersales)*

PWG
Pedal Position Sensor - This is a sensor which is used to measure the position of the accelerator pedal on vehicles equipped with electronically controlled throttles. Variations of the PWG are used on all versions of electronic throttle control, however they differ slightly in construction and function. Some PWG sensors are comprised of a conventional potentiometer while other version use a linear hall sensor. *(German: **P**edal**w**ert**g**eber)*

PWM
Pulse Width Modulation - Pulse width modulation is a method of signal transmission which varies the time of the signal rather than the voltage. PWM can also be used on a motor control circuit or illumination circuit to control the total current. For instance, by modulating the on time of an LED or bulb circuit, the brightness can be controlled. Also, by varying the PWM of a signal transmission circuit, various commands can be communicated to other systems. An example of PWM of BMW systems would be the dash illumination circuit (KL58g) or the cooling fan control circuit used on most current engine electronics systems. *(German: **P**uls**w**eiten**m**odulation)*

Q

R

RAM
Random Access Memory - RAM is used for the temporary storage of data or programs etc. RAM, as the name suggests, permits random access to the stored information. This means that all storage locations are equally accessible in the same amount of time. RAM has also read/write capabilities. RAM can be volatile or non-volatile. Volatile RAM means that data would be lost in the event of a power loss whereas non-volatile RAM (NVRAM) would retain data in the event of a power loss.

RDC
Tire Pressure Control - The RDC system consists of wheel mounted pressure sensors which send tire pressure and temperature information to the central (RDC) module. There are individual antennae which are mounted at each wheel well that receives information from sensors which are part of the valve stem assembly. This system is used on the E65/E66 and as an option on some E46 vehicles.
*(German: **R**eifen **D**ruck **C**ontrol)*

RDW
Tire Pressure Warning System - The RDW system is designed to monitor tire for a loss in tire pressure. This system does not measure tire pressure, but uses the wheel speed sensors to monitor the rotational speed of the tire and wheel assembly to determine losses in tire pressure. RDW requires no additional sensors or modules. The system is part of the DSc system and only requires an input switch to the DSC module for initialization. *(German: **R**eifen**d**ruck**w**arnung)*

RLS
Rain and Light Sensor - the RLS detects rain as well as ambient light. This signals are transferred along the bus systems to provide information to the lighting and wiper systems. The RLS is part of AIC and replaces the former Rain Sensor. For example, when rain is present, the wipers are switched to the appropriate intermittent speed to maintain a clear windshield. If insufficient ambient light is detected, the lighting system is signaled to activate the headlights (if in automatic mode).

RPS
Rollover Protection System - This system provides the vehicle occupants with adequate survival space in a rollover. It consists of a set of deployable rollover bars which are deployed in the event of an imminent rollover. RPS can be found on convertibles such as the E36iC, E46iC and E64. BMW roadsters such as the E36/7, E85 and Z52 use rigidly fixed rollover bars which provide the same level of protection as RPS. (See also URSS)

RXD
Wake-up Diagnosis Line - The RXD line is a part of the diagnosis bus. It is used as a wakeup signal to the system under diagnosis. It is a 12 volt digital signal that works in conjunction with TXD. As the diagnosis bus evolved into the newer more familiar D-bus, RXD was eventually dropped. Later systems used control modules which only needed a connection to TXD (D-Bus), which was used to wake up the necessary module. This eliminated the need for RXD. Phase out of the RXD line began in 1999 and most vehicles did not have RXD by 2001.

RZV
Direct Stationary Ignition - This is a distributorless ignition system which uses one ignition coil per cylinder which is triggered by the ECM (DME). This also allows full timing control over each cylinder and for misfire detection as well. RZV was introduced on the M42B18 engine and has been used on every subsequent engine system since. The only exception being the M73 which continued to use one ignition coil per bank. *(German: **R**uhende **Z**ündspannungs**v**erteilung)*

S

SAC
Self Adjusting Clutch - The self adjusting clutch was introduced in approximately 1999 as a means of eliminating clutch freeplay adjustments. It consists of a special pressure plate which requires the use of special tools for installation.
(German: Selbstnachstellende Kupplung)

SAE
Society of Automotive Engineers - SAE is a US based organization which has more than 84,000 members - engineers, business executives, educators, and students from more than 97 countries - who share information and exchange ideas for advancing the engineering of mobility systems. SAE sets the standards for development, events, and technical information and expertise used in designing, building, maintaining, and operating self-propelled vehicles for use on land or sea, in air or space. For example, SAE is responsible for setting the standards for automotive items such as bolts, bulbs and raw materials. The German equivalent of SAE is DIN - German Industrial Standard.

SASL
Satellite A-pillar, Left - The SASL is a satellite module which is part of the ***byteflight*** bus system. It is a remotely mounted satellite which contains accelerometers for detection of impacts, but also contains circuits used to deploy airbags and other pyrotechnic devices. *(German: **S**atellit **A**-**S**äule **l**inks)*

SASR
Satellite A-pillar, Right - See SASL, the SASR is provides the same functionality but is located in the right side a-pillar. *(German: **S**atellit **A**-**S**äule **r**echts)*

SBE
Passenger Seat Occupancy Detection System - This system is used by the various passive safety systems to determine whether or not the passenger seat is occupied. *(German: **S**itz**b**elegungs**e**rkennung)*

SBK
This is a German Acronym that stands for **S**afety **B**atterie **K**lemme - This is the German term for Battery Safety Terminal. See also BST.

SBSL
B-pillar Satellite, Left - This is a satellite module used on the byteflight system. It is used on the ASE and ISIS system to collect acceleration data and to actuate airbag ignition circuits. The function of this satellite is dependent upon application. The ASE and ISIS systems use the SBSL differently with regard to function and location. Refer to relevant training material for more information. *(German: **S**atellit **B**-**S**äule **l**inks)*

SBSR
B-pillar Satellite, Right - See SBSL, this sensor is the same as SBSL. It is installed at the right b-pillar. *(German: **S**atellit **B**-**S**äule **r**echts)*

S/E
Send and Receive - This refers to a module or system which sends and receives electronic information and messages. For example, the SIM contains S/E modules which are connected to the satellites via byteflight. The S/E modules send as well as receive optical signals and convert them to electrical signals with the help of the star coupler.

SFZ
Center Vehicle Satellite - This is a satellite module which is used on vehicles equipped with ***byteflight*** based passive safety systems. It is mounted in the center of the vehicle, usually under the center console . *(German: **S**atellite **F**ahrzueg **Z**entrum)*

SFZ-R
Center Vehicle Satellite with rollover protection - Same as SFZ, used on the E64 only. It provides the same functions as the SFZ, but with added sensors for rollover protection.

SG
*Control Unit - (German: **S**teuer**g**erät)*

SGM
Safety and Gateway Module - The SGM is the main controller of the byteflight on the ASE system (E60,E63,E64). The SGM combines the functions of the SIM and ZGM used on the ISIS system. *(German: **S**afety **G**ateway **M**odul)*

SGS
Seat Integrated Belt System - This is a seat belt system which is integrated into the seat. There are no outside seat belt connection points to the b-pillar. The entire seat belt system is contained within the structure of the seat. This type of arrangement is used on vehicles where seat belt attachment to the b-pillar is impractical such as the E31 and the E46 and E64 convertibles. *(German: **S**itzintegriertes **G**urt**s**ystem)*

SIA
*Service Interval Indicator -(German: **S**ervice-**I**ntervall-**A**nzeige)*

SIM
Safety and Information Module - The SIM is the main controller of the byteflight on the E65/66 and the E85. *(German: **S**icherheits-**I**nformations**m**odul)*

SLP
Secondary Air Pump- An electric air pump used to inject air into the exhaust system upstream of the catalytic converter. This reduces startup HC emissions. This system is triggered by the DME via the SLP relay. *(German: **S**ekundär-**L**uft-**P**umpe)*

SMBF
Seat Module, Passenger - The SMBF is a seat control module used on the E65/E66. It has the main responsibility for controlling seat functions by actuating the seat motors based on requests from the seat switch blocks. It is connected to the K-CAN-P and is located under the respective seat. *(German: **S**itz**m**odul **B**ei**f**ahrer)*

SMFA
Seat Module, Driver - The SMFA has the same functions of the SMBF. The SMFA controls the driver's side seat functions. See SMBF. *(German: **S**itz**m**odul **Fa**hrer)*

SMG
Sequential Manual Gearbox - The SMG system is a manual transmission which is controlled using electro-hydraulic means. The SMG system uses an electronic control unit. The SMG control unit monitors various input parameters. The SMG control unit processes this input information and provides the electronic control for the transmission via electro-hydraulically controlled actuators. This allows for a "clutchless" manual transmission which can be shifted via a pair a paddle shifters on the steering wheel or by a console mounted shifter which is a electronic input to the SMG control unit. This system was introduced on the E46 M3 in 2002 and subsequently added to the E85, E46, E60. E63 and E64.
(*German: **S**equenzielles **M G**etriebe* or ***S**equenzielles **M**anuelles (Schalt-)**G**etriebe*)

SRS
Supplemental Restraint System - This system refers to the airbag systems used on BMW vehicles. It is also a generic automotive industry term for vehicles with airbags.

SSBF
Seat Satellite, Passenger - The SSBF is a satellite on the ***byteflight*** system used on the E65/E66. The satellite is used to actuate igniter circuits for the front passenger airbag and the active head restraint. The SSBF also contains the seat occupancy electronics and receives input from the SBE sensor electronics. The input for the belt buckle switch is also monitored by the SSBF. It is located under the front seat next to the seat module. *(German: **S**atellit **B**ei**f**ahrer**s**itz).*

SSFA
Seat Satellite, Driver - SSFA provides the same functions as the SSBF. The SSFA is used for the driver's side functions. Refer to SSBF. *(German: **S**atellit **Fa**hrer**s**itz)*

SSH
Seat Satellite, Rear - This is a satellite module which is located under the rear seat on an E65/E66. It is only used in conjunction with vehicles which have the rear side airbag option. This module communicates with the SIM via ***byteflight***.

STVL
Door Satellite, Front Left - this is a satellite module used on byteflight based passive safety systems. It is mounted on the door, and contains crash sensing devices as well as pressure sensors to detect impacts by measuring pressure in the door cavity. It is used on the E65, E85, E60, E63 and E64. The STVL functions are slightly different depending upon vehicle application. *(German: **S**atellit **T**ür **V**orne **L**inks)*

STVR
Door Satellite, Front Right - See STVL, this sensor is the same as STVL but installed on the right door. *(German: **S**atellit **T**ür **V**orne **R**echts)*

SULEV
Super Ultra-low Emissions Vehicle

SZL
Steering Column Switch Center- This SZL is a satellite module used as the interface between the steering wheel electronics (and airbag igniter circuits) and the SIM/SGM via ***byteflight***. *(German: **S**chalt**z**entrum **L**enksäule)*

SZM
Switching Center Center Console - The SZM provides switching functions on various vehicles. The SZM is connected to the K-Bus and processes switch functions for systems such as DSC, RDW, Seat Heating etc. The SZM is located in the center console below the radio and IHKA control units. The SZM provides switch commands to these systems via a bus telegram. *(German: **S**chalt**z**entrum **M**ittelkonsole)*

T

TCU
Telematics Control Unit - The TCU allows for integration of cellular phones into BMW vehicles. Variations of the TCU also have integrated GPS for location of the vehicle in the event of an accident. The TCU is used in conjunction with BMW emergency call and SOS systems. This term can be used in conjunction with TEL as well.

TMBF
Door Satellite, Passenger Door - This is a satellite module which is part of the byteflight bus. This module is used on the E60, E63 and E64. In addition to crash detection and pressure sensing devices, the TMBF also contains electronics for body electronic functions such as power windows and door locks. *(German: **T**ur **M**odul **b**ei**f**ahrer)*

TMFA
Door Satellite, Driver - This module performs the same functions as TMBF, but is located on the driver's side. *(German: **T**ur **M**odul **Fa**hrer)*

U

URSS
*(German: **U**ber**r**oll **S**chutz **S**ystem)* - See Rollover Protection System

V

VANOS
Variable Camshaft Control - The VANOS system allows for variable timing control of the camshaft. *(German: **Va**riable **No**cken-**S**teuerung or **Va**riable **No**ckenwellen-**S**teuerung)*

VVT
Variable Valve Timing - VVT is an alternative (generic) term for Valvetronic.
(German: **V**ariable **V**entil**t**rieb)

W

X

Y

Z

ZAE
Central Activation Electronics - ZAE is an early passive safety system which succeeded the Siemens/Cipro systems in 1993. The main feature of this system is the integration of the crash sensing elements into one central housing which eliminates the fender mounted mechanical crash sensors. This system was introduced in 1993 and phased out in the 1997 model year and succeeded by the MRS systems.
*(German: **Z**entrale **A**uslöse **E**lektronik)*

ZCS
Central Coding Key - This is a special 37-digit code used to code modules to specific vehicles. It is usually located electronically in the instrument cluster and in an additional module for redundancy. The code contains information about the vehicle options and equipment level (i.e. AC or No AC, Auto or manual trans, engine size etc.) This method of coding modules will eventually be replaced by the FA code (or vehicle order).

ZGM
Central Gateway Module - The ZGM is a gateway module used in the E65/E66. It provides a gateway between the various bus systems and the diagnostic interface. All D-bus communication is funneled through the ZGM which acts as a "traffic cop" between these various systems. On some vehicles such as the E85, E60, E63 and E64. There is no separate ZGM, however the ZGM functions have been incorporated into the SIM/SGM. *(German: **Z**entral **G**ateway **M**odul)*

ZKE
Central Body Electronics - The ZKE system is responsible for controlling various body electronic functions. Systems such as power windows, power locks, wipers, and sunroof are some of the items controlled. ZKE systems usually consists of a central module referred to as the GM (General Module). The GM acts as the main system controlled and bus master. There are numerous variations of ZKE. The systems and sub-systems which are part of ZKE will vary between models. *(German: **Z**entrale **K**arosserie**e**lektronik)*

ZWD
Idle Control Valve (two winding) - This is a type of idle control valve which uses two opposing windings. The windings are supplied with a common power source and each winding has it's own ground circuit controlled by the ECM. One winding is for closing the idle valve while the other is used for the opening of the idle valve. These two opposing windings are ground controlled using a PWM signal. In order to control the idle, the ECM will apply a greater PWM duty cycle to one of the windings. For example, to increase the idle speed, the ECM would apply an increased duty cycle to the opening winding. *(German: **Z**wei**w**icklungs-(Leerlauf-)**D**rehsteller)* (Translation - Two winding idle rotary actuator)

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