Recommended parameter list
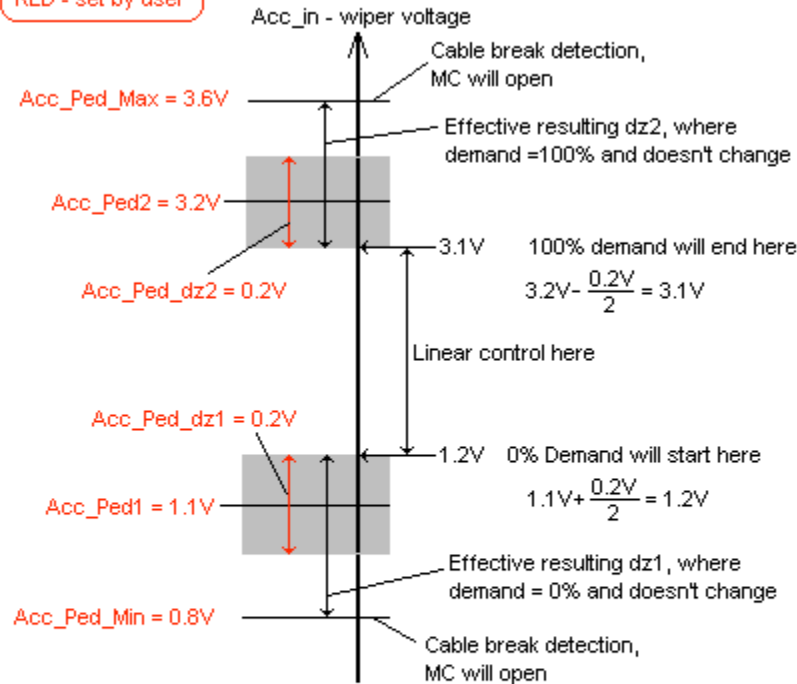
Mode_selector   binary

```
       High byte                 low byte

      _____         _____
     |                 |       |                 |
     |                 |       |                 |

       drive pedal charact. depends on the shaft speed
       |  if released, power tr-rs and main contactors open
       |  |   external drive release activated
       |  |   |  power steering active (needs external support)
       |  |   |  |  automatic setting of accel. pedal parameters
       |  |   |  |  |  binary freq shaft speed out (X1.10 terminal)
       |  |   |  |  |  |        regen allowed
       |  |   |  |  |  |        |  premagnetizing (synchronous motors)
       |  |   |  |  |  |        |  |  shaft speed limited at low vehicle speed
       |  |   |  |  |  |        |  |  |  acceleration demand priority
       |  |   |  |  |  |        |  |  |  |  brake contact used to control regen
       |  |   |  |  |  |        |  |  |  |  |
       |  |   |  |  |  |        |  |  |  |  |    phase sequence L1 L3 L2 (shaft=CCW when switch=Forward)
       |  |   |  |  |  |        |  |  |  |  |    |  brake current reduction based on the shaft speed
       |  |   |  |  |  |        |  |  |  |  |    |  |
     0 0 0 0  0 0 0 1      1  0  0  1   1  0  0  1  <----------default values
       |  |   |  |  |  |        |  |  |  |  |  |  |  |
       |  |   |  |  |  |        |  |  |  |  |  |  |  brake current reduction based on the vehicle speed
       |  |   |  |  |  |        |  |  |  |  |  |  phase sequence L1 L2 L3 (shaft=CW when switch=Forward)
       |  |   |  |  |  |        |  |  |  |  not used
       |  |   |  |  |  |        |  |  |  brake potentiometer used to control regen
       |  |   |  |  |  |        |  |  braking demand priority
       |  |   |  |  |  |        |  no shaft speed limit at low vehicle speed
       |  |   |  |  |  |        no premagnetizing (induction motors)
       |  |   |  |  |  no regen allowed
       |  |   |  |  |  digital encoded shaft speed out (X1.10 terminal)
       |  |   |  |  no automatic setting of accel. pedal parameters
       |  |   |  no power steering active (X1.6 = GND)
       |  |   external drive release not activated
       |  |  if released, power tr-rs blocked only
       |  drive pedal charact. depends on the vehicle speed
       |  not used
      not used
```

Parameter ID 301 'En_mod_sel'- AND mask for mode selector.

An example: Assume bit 7 of 'En_mode_sel' is 0. So, bit 7 (enable regen) of 'Mode selector' may be 1 or 0, regen will be disabled.
When bit 7 of 'En_mode_sel' is 1, regen can be enabled by making bit 7 of 'Mode selector' 1.

Acc_in - wiper voltage

Cable break detection,
MC will open

Acc_Ped_Max = 3.6V

Effective resulting dz2, where
demand =100% and doesn't change

Acc_Ped2 = 3.2V

Acc_Ped_dz2 = 0.2V

3.1V   100% demand will end here

$$3.2V - \frac{0.2V}{2} = 3.1V$$

Linear control here

Acc_Ped_dz1 = 0.2V

1.2V   0% Demand will start here

$$1.1V + \frac{0.2V}{2} = 1.2V$$

Acc_Ped1 = 1.1V

Effective resulting dz1, where
demand = 0% and doesn't change

Acc_Ped_Min = 0.8V

Cable break detection,
MC will open

If Acc_Ped_Min is inputed by user within dz1 (above 1.0V in this case),
it will be set to Acc_Ped1-half dz1 (1.0V). User better to set it below 1.0V.
The same for Acc_Ped_Max within dz2.

All above applies to the brake pedal (if used) as well.

I_max – refers to max motor drive current
IbrMax – regers to max motor regen current
I_MotBrake – refers to off-throttle regen motor current demand, cannot exceed Ibrake_Max
I_brake – refers to regen motor current demand by brake pedal, cannot exceed Ibrake_Max
IBrPed - refers to motor off-throttle regen current at particular **accel ped** position between 0% travel and [MotBrake_lim]%

102	Iabs_Rated	max motor current if both motor temp sensors or one heat sink temp sensor fail
103	IabsMax	max motor current (drive or regen) to protect inverter (<282A!) Will decrease linearly if temp exceeds HS_f0_TmpLim
104	Iabs_OverCur	
320	ImotBr50	
335	ImotBr_Max	max off-throttle regen motor current (acc pedal fully released)
336	MotBrake_Lim	% of accel ped travel below which off-throttle regen starts
345	Iacc_Min	creeping motor current
365	Ibrake_Max	max motor regen current (br pedal or br lights); normally > off-throttle IMorBr_max (but counts only if < than IabsMax)

430	Ibat_Max_Pos	max battery current during drive (protects battery, <282A)
431	Ibat_Max_Neg	max battery current during regen (protects battery, <282A) can be set low to protect the battery. The lower this setting, the softer regen rate, but lower RPM at which motor still supplies this current; above this rpm regen current reduced to keep DC power the same.

IRef_A_Ramp	motor driving current change max rate (If set to 0, hardware limit is 30A/ms)
I_Ref_Br_Ramp	motor regen current change max rate (If set to 0, hardware limit is 30A/ms)

n_Emerg_PowerOf:	9000 1/min	above that main contactors frop off and...
n_epo_Restart:	100 1/min	... automatically turn on when speed lowers to this
MotBrake_lim:	10%	default accel pedal position at which regen current drops to 0 (at any RPM)
IMorBr_max		Motor brake (regen) current for released accel pedal (0% pedal position)
n1_IMotbrake:	100 1/min	above that RPM regen starts when accel pedal released. Imot_Brake increases, reaching...
n2_IMotbrake:	1500 1/min	IMotBr_Max (or IBrake_Max or IabsMax whichever is lower) at this rpm
n_Max1_R:	7000 1/min	above that max drive current linearly reduced to 0 and...
n_Max2_R:	7500 1/min	...further to (neg) max braking current (CW)
n_Max1_L:	7000 1/min	above that max drive current linearly reduced to 0 and...
n_Max2_L:	7500 1/min	...further to (neg) max braking current (CCW)
n_Start:	100 1/min	above that drive will not turn on (contactors won't close)
n1_IBrake:	500 1/min	above that regen starts when brake pedal pressed, braking current I_Brake has max value of IBrPed for this pedal position (More press, larger IBrPed, up to IBrake_max.) for any particular pedal position and corresponding possible max IBrPed braking current, it starts at this n1_IBrake motor speed and reaches IBrPed ...
n2_IBrake:	2000 1/min	at this rpm.

420	Ubat_Undervolt	- below that main contactors drop off (protects battery)
421	Ubat_Min	- when approach that, I_max gradually reduced (prevents over discharging), batt never less than that
422	Ubat0_Min	- below that drive will not turn on (contactors won't close as "start" button pressed)
423	Ubat0_Max	- above that drive will not turn on (contactors won't close as "start" button pressed)
424	Ubat_Max	- when approach that, I_brake gradually reduced (no overcharging), batt never more than that, limit to 380 VDC
425	Ubat0_Overvolt	- above that main contactors drop off (protects battery and inverter), limit = 385VDC

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Optimas: batts/system voltage  ->>  28/336V      24/288V       20/240

420 Ubat_Undervolt  - 10.30 V/batt...288.........247.........206
421 Ubat_Min        - 10.75 V/batt...301.........258.........215
422 Ubat0_Min       - 11.50 V/batt...322.........276.........230
423 Ubat0_Max       - 13.90 V/batt...370.........334.........278
424 Ubat_Max        - 14.22 V/batt...370*........342.........285
425 Ubat0_Overvolt  - 15.00 V/batt...385*........360.........300
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* inverter limitation