YASKAWA
Mechatronics Solutions

SI-S1 Option Card
for CANopen
Instructions

Issued date; 06/FEB/2002

This document describes the use of the CANopen option board (SI-S1) for YASKAWA inverter.
It is intended to provide information necessary to start-up and use the board.

The option card software is designed to fulfill following profiles:

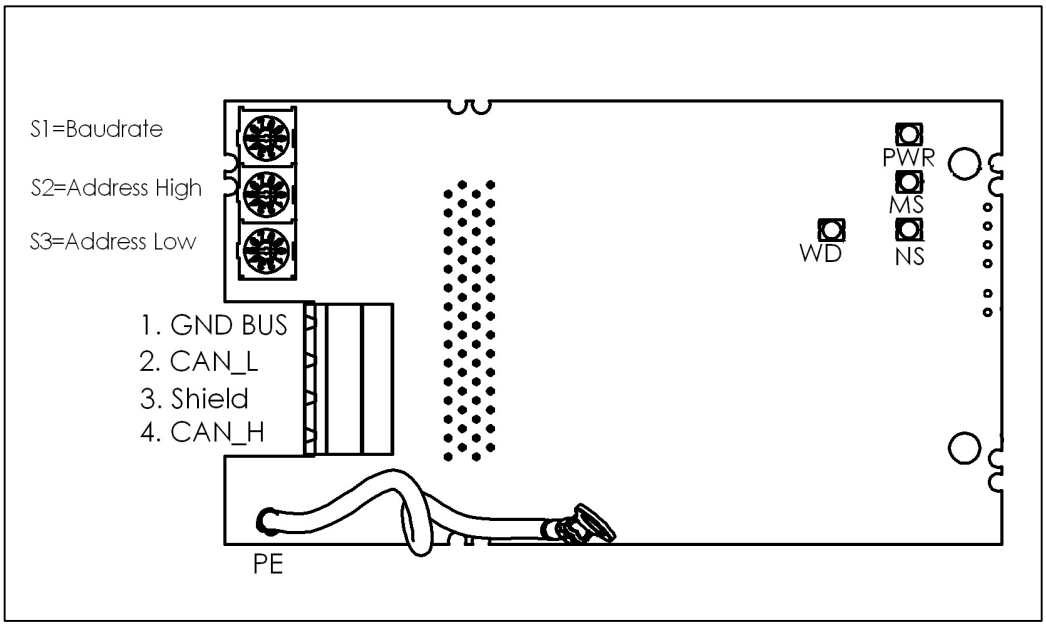
DS 301 COMMUNICATION PROFILE

The device has passed the conformance test for the CANopen Communication Profile DS 301 ver. 4.02.

DSP 402 DRIVES AND MOTION PROFILE

In the drive the velocity mode is implemented according to DSP 402 ver. 1.1

1 SI-S1 Hardware overview



1.1 Status LED's

There are four status and indication LED's on the option board. During start-up a LED test will be performed to make sure the LED's are working. Test sequence: Red - Green - Off.

Name	Colour	Function	
Power	Green	Indicates 5V power supply	
WD (watchdog)	Green / Red	Turned off: Lit green: 1 Hz green: 2 Hz green: Lit red: 2 Hz red: Other indication:	Option board CPU not running. Initialization Normal operation Initialization phase Internal option board error. Inverter ini failure firmware Unspecified, option board error.
NS (Network Status)	Green / Red	1 Hz green: Lit green: Lit red:	Bus off or error passive Link OK, On-line, connected Critical link failure.
MS (Module Status)	Green / Red	Off: 1Hz red: Lit green: 1 Hz green 2 Hz green	No bus connection (ini phase) Bus initialization failed Operational State Pre Operational State Stopped State

1.2 CANopen connector

The CANopen network cables are connected to the option board via a screw connector. The pin layout for the connector is shown in the table below.

Pin	Name	Function
1	CAN_GND	CAN_GND
2	CAN_L	CAN_L bus line (dominant low)
3	CAN_SHLD	CAN shield (Optional)
4	CAN_H	CAN_H bus line (dominant high)

1.3 Node Address

The network node address is set via two rotary switches on the option board (ADDRESS_HIGH and ADDRESS_LOW). Possible node addresses are between 0 - 99 in decimal format.
The address is calculated in the following way

Address = (ADDRESS_HIGH * 10) + (ADDRESS_LOW * 1)

NOTE: The node address can not be changed during operation.

1.4 Baudrate

The baudrate is configured with one decimal rotary switch. See table below for supported baudrates.

Switch setting	Baudrate
0	Not Available
1	10 kbit / s
2	20 kbit / s
3	50 kbit / s
4	125 kbit / s
5	250 kbit / s
6	500 kbit / s
7	800 kbit / s
8	1 Mbit / s
9	Not available

2 Attention for DSP 402

To use the objects from the Drive Profile DSP 402 the polenumber must be set. If the pole number has initial setting all objets out of the 6000hex area are not available.

G5, F7, E7 :

THE POLENUMBER OF THE MOTOR HAS TO BE SET IN O1-03 !!!

V7:

THE POLENUMBER OF THE MOTOR HAS TO BE SET IN n35 !!!

After that the inverter has to be switched off and on !!!!!

3 Inverter Object List

3.1 Communication Objects

3.2 Manufacturer specific Objects

2160	Enter Not Limited Response	23
2200	Bus State	23
2800	Bus Off Control	23
3000	Module State	23

3.3 Drives and motion control (DSP 402)

3.3.1 Common Entries

Index	Object name	Page
60FD	Digital Input	24
60FE	Digital Output	25

3.3.2 Device Control

Index	Object name	Page
6040	Controlword	26
6041	Statusword	26
6060	Modes_of_operation	27
6061	Modes_of_operation_display	27

3.3.3 Velocity Mode

Index	Object name	Page
6042	vl_target_velocity	28
6043	vl_velocity_demand	28
6044	vl_control_effort	29
6046	vl_velocity_min_max_amount	29
6048	vl_velocity_acceleration	30
6049	vl_velocity_deceleration	30
604A	vl_velocity_quick_stop	31
604C	vl_dimension_factor	31
604D	vl_pole_number	32

4 Object Description

4.1 Communication Objects (DSP 301)

Index (hex)	1000
Object Name	Device type
Description	This object describes the type of the device and its functionality. It is composed of a 16 bit field which describes the device profile that is used and a second 16 bit field which gives additional information about optional functionality.
Class	Mandatory
Access	Read only
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1001
Object Name	Error register
Description	This bit shows the fault status of the device. If any errors occurs in the device bit 0 (generic error) is set to one.
Class	Mandatory
Access	Read only
PDO Mapping	Optional
Units	-
Value range	Unsigned 8

Index (hex)	1003
Object Name	Pre-defined error field
Description	The subindex of this object contain the errors that have occurred on the drive. Subindex 0hex contains the number of errors.
Class	Mandatory
Access	Read write (Subindex 0) Read only (subindex 1- FE hex)
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1005
Object Name	COB-ID SYNC message
Description	This object defines the COB-ID of the synchronisation object (SYNC). Further it defines whether the device consumes or generates the SYNC.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 32

Object 1006 : Communication cycle period

This object is only for CAN master.

Index (hex)	1008
Object Name	Manufacturer Device Name
Description	This object contains the Manufacturer device name
Class	Optional
Access	Read only
PDO Mapping	No
Units	-
Value range	Visible string

Index (hex)	1009
Object Name	Manufacturer Hardware Version
Description	This object contains the Manufacturer hardware version
Class	Optional
Access	Read only
PDO Mapping	No
Units	-
Value range	Visible string

Index (hex)	100A
Object Name	Manufacturer Software Version
Description	This object contains the Manufacturer software version It indicates the version number of the EEPROM.
Class	Optional
Access	Read only
PDO Mapping	No
Units	-
Value range	Visible string

Index (hex)	100C
Object Name	Guard Time
Description	This object contains the guard time. The unit is milliseconds.
Class	Optional
Access	Read write
PDO Mapping	No
Units	(msec)
Value range	Unsigned 16

Index (hex)	100D
Object Name	Life Time Factor
Description	This object contains the life time factor. It defines how often the guard time cannot be kept until an error is created.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 8

Index (hex)	100E
Object Name	Node Guarding Identifier
Description	This object contains the node guarding identifier. It defines the identifier for the node guarding.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1010
Object Name	store parameters
Description	This object supports the saving of parameters in non volatile memory Our device has to save the parameters on command only.!!!!!! (bit 0 = 1 and bit 1 = 0 for each subindex) To save the parameter SAVE has to be written in the wanted subindex.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1011
Object Name	Restore default parameters
Description	This object supports to restore the default parameters. Our device has to restore parameters by command (bit 0 = 1) To restore the parameters LOAD has to be written in the wanted subindex.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1014
Object Name	COB-ID Emergency Object
Description	This object defines the COB-ID of the emergency object.
Class	Conditional
Access	Read only
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1016
Object Name	Consumer Heartbeat Time
Description	This object defines the expected heartbeat cycle time and has to be bigger higher than the corresponding producer heartbeat time. Monitoring starts after receiving the first producer heartbeat. If 0 than it is not used. Setting in 1 ms.
Class	Optional
Access	Read write
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1017
Object Name	Producer Heartbeat Time
Description	This object defines the cycle time of the heartbeat. The setting is in 1ms.
Class	Conditional
Access	Read only
PDO Mapping	No
Units	-
Value range	Unsigned 32

Index (hex)	1018
Object Name	Identity Object
Description	This object contains general information of the drive
Class	Mandatory
Access	Read only
PDO Mapping	No
Units	-
Value range	Unsigned 32

4.3.1 Inverter Error List

Object No.	Object name	Inverter Display	Available : Inverter Type
2220	Continuous over current	OC	V7,F7,G5
2221	Continuous over current no.1	OL 2	V7,F7,G5
2310	Continuous over current	OL 1	V7,F7,G5
2311	Continuous over current no.1	OL 3	V7,F7,G5
2312	Continuous over current no.2	OL 4	F7,G5
2330	Earth leakage	GF	F7,G5, V7 (bigger 4,0 kW)
2340	Short circuit	SC	G5, V7 (bigger 4,0 kW)
3130	Phase failure	PF	F7,G5, V7 (from Software 24)
3210	DC link over voltage	OV	V7,F7,G5
3220	DC link under voltage	UV 1	V7,F7,G5
3221	DC link under voltage no1	UV 3	F7,G5
3300	Output voltage	LF	V7,F7,G5
4210	Excess temperature device	OH 1	F7,G5
4280	Temperature device prealarm	OH	V7,F7,G5
4310	Excess temperature drive	OH 4	F7,G5
4410	Excess temperature supply	RH	F7,G5, V7 (bigger 4,0 kW)
5200	Control	UV 2	V7,F7,G5
5300	Operating unit	OPR	V7,F7,G5
5420	Chopper	RR	F7,G5
5441	Contact1=manufacturer specific	EF 3	V7,F7,G5
5442	Contact2=manufacturer specific	EF 4	V7,F7,G5

5443	Contact3=manufacturer specific	EF 5	V7,F7,G5
5444	Contact4=manufacturer specific	EF 6	V7,F7,G5
5445	Contact5=manufacturer specific	EF 7	V7,F7,G5
5480	Contact6=manufacturer specific	EF 8	G5
5481	Fault input from option card	EF 0	V7,F7,G5
5450	Fuses	PUF	V7,F7,G5
5530	EEPROM	ERR	F7,G5
6000	Device software	CPF	F7,G5
7180	Motor overspeed	OS	F7,G5
7305	Incremental Sensor Fault	PGO	F7,G5
8313	Standstill Torque	SVE	F7,G5
8321	Insufficient Torque	DEV	F7,G5

	Object Name	**Inverter Display**	**Available : Inverter Type**
FF01	Motoroverheating Alarm	OH 3	F7
FF02	PID Feedback Lost	FBL	V7,F7
FF03	Undertorque Detected 1	UL 3	F7,V7
FF04	Undertorque Detected 2	UL 4	F7
FF05	High Slip Braking OL	OL 7	F7
FF06	Control Fault	CF	F7
FF07	BUS Error	BUS	V7,F7,G5
FF08	Memobus Error	CE	V7,F7,G5
FF09	Device specific	(Not used) Future use only	
FF0A	Device specific	(Not used) Future use only	
FF0B	Device specific	(Not used) Future use only	

These error codes will be shown in object 1003 (subindex 01)
if the correspondent error occurred on the drive.

4.2 Manufacturer specific Objects (DSP 301)

Manufacturer Specific Profile Area (2000hex - 5FFFhex)
PDO mapping see page 33

4.3.1 Objects overview

Index	SubIndex	Function	Data lenght
2000	0	operation_com	2 byte
2010	0	speed_com	2 byte
2020	0	abtorque_ref	2 byte
2030	0	torque_comp	2 byte
2040	0	Read Modbus Command - Number Of Subindex	1 byte
	1	Read Modbus Command - Address + Data	4 byte
2050	0	Write Modbus Command - Number Of Subindex	1 byte
	1	Write Modbus Command - Address + Data	4 byte
2060	0	Memobus Enter Command not Limited	4 byte
2070	0	Memobus Enter Command Limited	4 byte
2080	0	Optional_input	4 byte
2100	0	inv_status	2 byte
2110	0	freq_ref	2 byte
2120	0	curr_out	2 byte
2130	0	invtorque_ref	2 byte
2140	0	Read Modbus Command Response - Number Of Subindex	1 byte
	1	Read Modbus Command Response - Address + Data	4 byte
2150	1	Write Memobus Response	4 byte
2160	0	Memobus Enter Command not Limited Response	4 byte
2200	0	Bus_state (read only)	1 byte
2800	0	Bus Off Control	2 byte
3000	0	Module_State (read only)	1 byte

4.3.2 Input Parameters

Index	Sub index	Parameter
2000hex	0	Operation Command
2010hex	0	Speed Command
2020hex	0	Torque Reference
2030hex	0	Torque compensation
2040hex	1	Read Modbus Request
2050hex	1	Write Modbus Request
2060hex	0	Memobus Enter Command Not Limited
2070hex	0	Memobus Enter Command Limited
2080hex	0	Optional Input Object

4.2.2.1 Input data to inverter

Input data	Function
Operation Command	See the table
Speed command	unit depends on parameter O1-03 (n35) [RPM/Hz/%]
Torque Reference / Limit	0.1% (Vector control mode only)
Torque compensation	0.1% (Vector control mode only)

High speed input data to inverter, updated every 5 ms.

4.2.2.2 Operation Command

Bit No	Description	Parameters E7, F7, G7	Parameters V7
0	Forward Run	Effective when the setting is B1-02=3	Effective when the setting is n03=3
1	Reverse Run	Effective when the setting is B1-02=3	Effective when the setting is n03=3
2	Terminal 3 function	Depends on H1-01 setting	Depends on n53 setting
3	Terminal 4 function	Depends on H1-02 setting	Depends on n54 setting
4	Terminal 5 function	Depends on H1-03 setting	Depends on n55 setting
5	Terminal 6 function	Depends on H1-04 setting	Depends on n56 setting
6	Terminal 7 function	Depends on H1-05 setting	not used
7	Terminal 8 function	not used	not used
8	External Fault (EF0)		
9	Fault Reset		
A	Not used		
B	Not used		
C	Not used		
D	Not used		
E	Not used		
F	Not used		

4.2.2.3 Optional Input Object

Index	Subindex	Name	Data
2080	0	Optional Input Object	application dependent

4.3.3 Output Parameters

Index	Sub index	Parameter
2100hex	0	Inverter Status
2110hex	0	Output Frequency
2120hex	0	Output current
2130hex	0	Output Torque
2140hex	1	Read Memobus Response
2150hex	1	Write Memobus Response
2160hex	0	Memobus Enter Command Not Limited Response

4.2.3.1 Output data from inverter

Output data	Function
Inverter Status	See the table
Output Frequency	unit depends on parameter O1-03 (n35) [RPM/Hz/%]
Output Current	0.1A or 0.01A (depend on inverter capacity)
Output Torque	0.1% (Vector control mode only)

High speed output data, updated every 5 ms

4.2.3.2 Inverter Status

Bit Nc	Description
0	Running
1	Zero Speed
2	Reverse Running
3	Reset Command Receiving
4	Speed Agree
5	Inverter Ready
6	Minor Fault
7	Major Fault
8	OPE error
9	During Momentary Power Ride-through (not used with V7)
A	Local/Remote
B	Terminal 9-10 Output (MA, MB with V7)
C	Terminal 25 Output (P1 with V7, M1-M2 with F7)
D	Terminal 26 Output (P2 with V7, M3-M4 with F7)
E	Motor Selection (not used with V7)
F	Zero Servo Completion (used only with pulsgenerator)

4.3.4 Memobus data

4.2.4.1 Memobus Read request

Index	Subindex	Name	Data
2040	0	Number of entries	
	1	Memobus Read Request	Memobus Address
			16 bit

4.2.4.2 Memobus Write Request

Index	Subindex	Name	Data
2050	0	Number of entries	
	1	Memobus Write Request	Memobus Address + Data
			16 bit + 16 bit

4.2.4.3 Memobus Enter Command Not Limited *(not needed with a V7 drive)*

Index	Subindex	Name	Data
2060	0	Not Limited Enter Command	“ SAVE “

To enable inverter parameter changes this enter command must be used.
It is enough to use it after the last changed inverter parameter.
(If a block transfer is done please use this enter command only one time after the last parameter changed)
The use of this command is not limited.

Attention :

After power of the inverter all changes are lost !!!!

4.2.4.4 Memobus Enter Command Limited

Index	Subindex	Name	Data
2070	0	Limited Enter Command	“ SAVE “

To enable inverter parameter changes this enter command must be used.
It is enough to use it after the last changed inverter parameter.
(If a block transfer is done please use this enter command only one time after the last parameter changed)
The use of this command is limited up to 100000 times !!!!

Attention :

After power of the inverter all changes will be kept !!!!

4.2.4.5 Memobus Read Response

Index	Subindex	Name	Data
2140	0	Number of entries	
	1	Memobus Read Response	Memobus Address + Data
			16 bit + 16 bit

4.2.4.6 Memobus Write Response

Index	Subindex	Name	Data
2150	0	Number of entries	
	1	Memobus Write Response	Memobus Address + Data
			16bit + 16 bit

4.2.4.7 Memobus Enter Command Not Limited Response

Index	Subindex	Name	Data
2160	0	Not Limited Enter Response	“ SAVE “ 32 bit

Inverter related Objects

Index (hex)	2200
Object Name	Bus State
Description	This object defines the bus state of the node
Class	Conditional
Access	Read only
PDO Mapping	Possible
Units	--
Value range	Unsigned 16

Index (hex)	2800
Object Name	Bus Off Control
Description	This object defines the bus off control of the node
Class	Conditional
Access	Read only
PDO Mapping	Possible
Units	--
Value range	Unsigned 8

Index (hex)	3000
Object Name	Module State
Description	This object defines the module state
Class	Conditional
Access	Read only
PDO Mapping	Possible
Units	--
Value range	Unsigned 8

4.3 Drives and motion control (DSP 402)

4.3.1 Common entries

Index (hex)	60FD
Object Name	Digital_input
Description	Simple digital output of device ***YASKAWA specifies this object as the inverter digital output monitor.*** (Input of the network)
Class	Option
Access	Read only
PDO Mapping	Possible
Units	--
Value range	0 … (2^{32}-1)

Corresponding data of E7, F7, G7, V7	
E7, F7, G7	**V7**
Bit No. 16 : (terminal MA/MB MC) 17 : (terminal M1 M2) 18 : (terminal M3 M4) 19: 20: 21: 22: 23: bit 0 to 15 are reserved as standard function and no specification for E7, F7, G7	Bit No. 16 : (terminal MA/MB output) 17 : (terminal P1 output) 18 : (terminal P2 output) 19: 20: 21: 22: 23: bit 0 to 15 are reserved as standard function and no specification for V7

Index (hex)	60FE
Object Name	Digital_output
Description	Simple digital input for devices ***YASKAWA specifies this object as additional digital inputs of the inverter*** (output of the network)
Class	Option
Access	Read write (used as write only)
PDO Mapping	Possible
Units	--
Value range	0 … (2^{32}-1)

Corresponding data of E7, F7, G7, V7	
E7, F7, G7	**V7**
Bit No. 18 : (terminal 3 function) 19 : (terminal 4 function) 20 : (terminal 5 function) 21 : (terminal 6 function) 22 : (terminal 7 function) 23 : (terminal 8 function) not used with E7, F7,G7 24 : (EFO) 25 : (Fault reset) bit 0 to 15 are reserved as standard function and no specification for E7, F7, G7	Bit No. 18 : (terminal 3 function) 19 : (terminal 4 function) 20 : (terminal 5 function) 21 : (terminal 6 function) 22 : (terminal 7 function) 23 : not used 24 : (EFO) 25 : (Fault reset) bit 0 to 15 are reserved as standard function and no specification for V7

4.3.2 Device control

Index (hex)	6040
Object Name	Controlword
Description	Set our device to different states
Class	Mandatory
Access	Read write
PDO Mapping	Possible
Units	--
Value range	0 … 65535

Index (hex)	6041
Object Name	Statusword
Description	Shows the different states of our device
Class	Mandatory
Access	Read only
PDO Mapping	Possible
Units	--
Value range	0 … 65535

Index (hex)	6060
Object Name	Modes_of_operation
Description	Switches to the actual chosen operation mode. Only G5 with pulsgenerator has torque control mode. The V7 has only one operation mode (Velocity Mode).
Class	Mandatory
Access	Write only
PDO Mapping	Possible
Units	--
Value range	-128…127

Corresponding data of E7, F7, G7, V7	
E7, F7, G7	**V7**
Modes_of_Operation 2 Velocity Mode 4 Torque Profile Mode not implemented!!!	**Modes_of_Operation** 2 Velocity Mode 4 Torque Profile Mode ..? not possible

Index (hex)	6061
Object Name	Modes_of_operation_display
Description	Shows the mode of our device
Class	Mandatory
Access	Read only
PDO Mapping	Possible
Units	--
Value range	-128…127

Corresponding data of E7, F7, G7, V7	
E7, F7, G7	**V7**
2 Velocity Mode 5 Torque Profile Mode not implemented 6	..? always : 2 Velocity Mode

4.3.3 Velocity Mode

Index (hex)	6042
Object Name	vl_target_velocity
Description	vl_target_velocity is the required speed of the system. It is interpreted in rpm . Parameter o1-03 has to be set by customer before operation.!! Vl_target_velocity has to be multiplicated with the Dimension factor. The Dimension factor can be used for setting the resolution also .
Class	Mandatory
Access	Read write
PDO Mapping	Possible
Units	Rpm
Value range	-32768…0…32767

Index (hex)	6043
Object Name	vl_velocity_demand
Description	vl_target_velocity is the speed reference provided by the ramp function and limiting functions in units of rpm
Class	Mandatory
Access	Read only
PDO Mapping	Possible
Units	Rpm
Value range	-32768…0…32767

Index (hex)	6044
Object Name	vl_control_effort
Description	vl_control_effort is the output frequency of our inverter to the motor. The unit is rpm In case of close loop vector control mode the exact motor speed can be read out.
Class	Mandatory
Access	Read only
PDO Mapping	Possible
Units	Rpm
Value range	-32768…0…32767

Index (hex)	6046
Object Name	vl_velocity_min_max_amount
Description	vl_velocity_min_max_amount consists of two subindex. One for max and one for the min amount. They do not have units. Yaskawa does interpret these values as rpm
Class	Mandatory
Access	Read write
PDO Mapping	Possible
Units	Rpm
Value range	0..(2^{32}-1)

Index (hex)	6048
Object Name	vl_velocity_acceleration
Description	Vl_velocity_acceleration specifies the acceleration time It consists of two subindex (delta_speed and delta_time). So it is generated as the quotient of the delta_speed and delta_time subindex. This object correspond to the acceleration time of the inverter.
Class	Mandatory
Access	Read write
PDO Mapping	Possible
Units	Rpm (subindex 1); Second (subindex 2)
Value range	0…(2^{23} –1) (subindex 1); 0…65535 (subindex 2)

Index (hex)	6049
Object Name	vl_velocity_deceleration
Description	Vl_velocity_deceleration specifies the deceleration time It consists of two subindex (delta_speed and delta_time). So it is generated as the quotient of the delta_speed and delta_time subindex. This object correspond to the acceleration time of the inverter.
Class	Mandatory
Access	Read write
PDO Mapping	Possible
Units	Rpm (subindex 1); Second (subindex 2)
Value range	0…(2^{23} –1) (subindex 1); 0…65535 (subindex 2)

Index (hex)	604A
Object Name	vl_velocity_quick_stop
Description	Vl_velocity_quick_stop specifies the quick stop ramp. It consists of two subindex (delta_speed and delta_time) So it is generated as the quotient of the delta_speed and delta_time subindex. This object correspond to the emergency stop time of the inverter.
Class	Optional
Access	Read write
PDO Mapping	Possible
Units	rpm (subindex 1); Second (subindex 2)
Value range	0…(2^{23} –1) (subindex 1); 0…65535 (subindex 2)

Index (hex)	604C
Object Name	vl_dimension_factor
Description	Vl_dimension_factor is to multiplicate the Target Velocity (reference speed) with a customer specific factor. It consists of two subindex (numerator and denominator) So it is generated as the quotient numerator and denominator
Class	Optional
Access	Read write
PDO Mapping	Possible
Units	Rpm (subindex 1); Second (subindex 2)
Value range	0…(2^{23} –1) (subindex 1); 0…65535 (subindex 2)

Index (hex)	604D
Object Name	vl_pole_number
Description	Vl_pole_number sets the number of poles of the connected motor This data in necessary for us to calculate for rpm (all velocity values) to Hz. **It is mandatory for the customer to set the pole number.!!!!** This is possible enter by digital operator or by object dictionary entry.
Class	Optional
Access	Read write
PDO Mapping	Possible
Units	- (number of poles)
Value range	0…255

5 PDO Mapping

5.1 Receive PDO

Receive PDO Parameter			Receive PDO Mapping	
PDO number	**COB-ID**	**Index**	**Mapped objects**	**Index**
1	201hex	1400	Subindex 1: 6040	1600
2	301hex	1401	Subindex 1: 6040 Subindex 2 : 6060	1601
6	241hex	1405	Subindex 1: 6040 Subindex 2 : 6042	1605
7	341hex	1406	Subindex 1: 6040 Subindex 2 : 60FE	1606
8	381hex	1407	Subindex 1: 6040 Subindex 2 : 6060	1607
21	Not assigned	1414	Subindex1 : 6048 sub1 Subindex2 : 6048 sub2	1614
22	Not assigned	1415	Subindex1 : 6049 sub1 Subindex2 : 6049 sub2	1615
23	Not assigned	1416	Subindex1 : 604A sub1 Subindex2 : 604A sub2	1616
24	Not assigned	1417	Subindex1 : 604C sub1 Subindex2 : 604C sub2	1617
36	Not assigned	1423	Subindex1 : 2000	1623
37	Not assigned	1424	Subindex1 : 2010	1624
38	Not assigned	1425	Subindex1 : 2020	1625
39	Not assigned	1426	Subindex1 : 2030	1626
40	Not assigned	1427	Subindex1 : 2040 sub1	1627
41	Not assigned	1428	Subindex1 : 2050 sub1	1628

5.2 Transmit PDO

Transmit PDO Parameter			Transmit PDO Mapping	
PDO number	**COB-ID**	**Index**	**Mapped objects**	**Index**
1	181hex	1800	Subindex 1: 6041	1A00
2	281hex	1801	Subindex 1: 6041 Subindex 2 : 6061	1A01
6	1C1hex	1805	Subindex 1: 6041 Subindex 2 : 6044	1A05
7	2C1hex	1806	Subindex 1: 6041 Subindex 2 : 60FD	1A06
21	Not assigned	1814	Subindex1 : 6042	1A14
22	Not assigned	1815	Subindex1 : 6043	1A15
23	Not assigned	1816	Subindex1 : 6048 sub1 Subindex2 : 6048 sub2	1A16
24	Not assigned	1817	Subindex1 : 6049 sub1 Subindex2 : 6049 sub2	1A17
25	Not assigned	1818	Subindex1 : 604A sub1 Subindex2 : 604A sub2	1A18
26	Not assigned	1819	Subindex1 : 604C sub1 Subindex2 : 604C sub2	1A19
36	Not assigned	1823	Subindex1 : 2100	1A23
37	Not assigned	1824	Subindex1 : 2110	1A24
38	Not assigned	1825	Subindex1 : 2120	1A25
39	Not assigned	1826	Subindex1 : 2130	1A26
40	Not assigned	1827	Subindex1 : 2140 sub1	1A27
41	Not assigned	1828	Subindex1 : 2160	1A28

6 Related E7,F7;G7 Parameters

Parameter No.	Name	Description	Factory Setting
b1-01	Frequency Reference Selection	0: Digital Operator 1: Terminal 2: Serial Communication **3: Option** *3 = The Frequency Reference comes from SI-S1 option card.*	1
b1-02	Operation Method Selection	0: Digital Operator 1: Terminal 2: Serial Communication **3: Option** *3 = The Run Command comes from SI-S1 option card.*	1
F6-01	Stopping Method after communication error	0: Ramp to stop according to C1-02 setting 1: Coast to stop 2: Ramp to stop according to C1-09 setting (fast-stop) 3; Operation continues, alarm only	1
F6-02	Input level of external error form option card	0: Always detected 1: Detected only during running	0
F6-03	Stopping method for external error from option card	0: Rump to stop according to C1-02 setting 1: Coast to stop 2: Ramp to stop according to C1-09 setting (fast-stop) 3; Operation continues, alarm only	1

EF0; External Fault Signal from Serial Communication Option Card (SI-S1). Operation command Bit.8.

BUS; Serial Communication Error between Serial Communication Option Card (SI-S1) and CANopen network.

7 V7 Related Parameter

Parameter No.	Name	Description	Factory Setting
n03	Operation reference selection	**3: Option** *3 = The run command comes from SI-S1 option card.*	0
n04	Frequency reference selection	**9: Option** *9 = The frequency reference comes from SI-S1 option card.*	1