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Yaskawa NS600 Indexer

Information Sheet for Crimson v2.0

Compatible Devices

- Yaskawa NS600 Indexer

Verified Device

- JUSP - NS600

Version 1.10 – Added POSTnnn Command. See "Notes" for usage.

Accessible Data

This is the data as it appears in the Configuration Table. Related functions have been grouped to the extent possible. For example, Program table operations are grouped regardless of actual NS600 command mnemonics.

G3 Mnemonic	NS600 Function
PAR	PRM : Parameter Read-Write
PAT	TRM : Temporary Parameter Write
ABS	ABSPGRES : Absolute PG Reset
ACC	ACC : Acceleration Reservation
ALMH	ALMn : Alarm History Read
ALM	ALM : Alarm or Warning Read
ALR	ARES :Alarm Reset
ATC	ALMTRCCLR : Alarm Trace Clear
ATI	INERTIA : Auto-tuning Inertia Display
ATS	TUNESTORE : Auto-tuning Inertia Save
CZE	CURZERO : Motor Current Zero Adjustment
DBM	DBRMS : DB Load Ratio Monitor
DEC	DEC : Deceleration Reservation
ERR	ERR : Error Read
HOM	ZRN : Homing Start Execution
JGP	JOGP : Jog Forward
JGN	JOGN : Jog Reverse
JSI	JSPDINIT : JOG Speed Table Initialization
JSR	JSPDT : Jog speed reservation
JSS	JSPDSTORE : JOG Speed Table Save

MLS	MLTLIMSET : Multi Turn Limit Setting
MON1	PUN : Current Issue Position
MON2	PER : Position Error
MON3	NFB : Motor Speed
MON4	NREF : Speed Reference
MON5	TREF : Torque Reference
MON6	STS : Status Flag
MON7	PFB : Current Motor Position
MON8	POS : Target Position
MON9	DST : Target Distance
MON10	RPOS : Registration Target Position
MON11	RDST : Registration Target Distance
MSZ	MTSIZE : Motor Capacity Display
MTD	MTTYPE : Motor Type Display
NSI	IN2 : NS600 Input Signal Monitor
NSJ	IN2TEST : NS600 Input Signal Reservation
NSM	OUT2 : NS600 Side Output Signal Monitor
NSR	OUT2TEST : NS600 Output Signal Reservation
NST	TYPE : NS600 Type Code Display
NSV	VER : NS600 Software Version Display
NSY	YSPEC : NS600 Y Spec. No. Display
PAI	PRMINIT : Parameter Initialization
PT	PGTYPE : PG Type Display
PV	PGVER : PG Software Version Display
PGA	RDSTT : Program Table Register Distance
PGB	RSPDT : Program Table Register Speed
PGC	SPDT : Program Table Position Speed
PGI	PGMINIT : Program Initialization
PGL	LOOPT : Program Table LOOP Read-Write
PGN	NEXTT : Program Table NEXT Read-Write
PGP	PGMSTEP : Program Pass Through Monitor
PGQ	LOOP : Program Pass Through Monitor
PGR	PGMRES : Program Reset
PGS	STARTsss : Program Operation Start
PGT	START : Program Operation Restart
PGV	PGMSTORE : Program Table Save
PGY	STOP : Program Operation Interruption
PGZ	EVTIME : Program Lapse of Time Monitor
POA	STA : Positioning Start Absolute
POR	STI : Positioning Start Relative
POS	ST : Positioning Start
POT	POSA : Target Position Reservation
POU	POSI : Target Position Reservation

POX	SKIP : Positioning Stop
POY	HOLD : Positioning Interruption
PRA	RSA : Position Start with Registration
PRR	RSI : Position Start with Registration
PRS	RS : Position Start with Registration
PRV	SPD : Positioning Speed Reservation
PTRF	Read Program Table Position Function
PTRV	Read Program Table Position Value
PTWS	Send PTWA+PTWB <Data=Table Position>
PTWF	Write Program Table Position Function
PTWV	Write Program Table Position Value
RGM	RGRM : Regenerative Load Ratio Monitor
RJF	RJOGP : Jog Forward with Registration
RJR	RJOGN : Jog Reverse with Registration
RRD	RDST : Registration Distance Reservation
RRS	RSPD : Registration Speed Reservation
RST	RES : Reset
SET	ZSET : Coordinates Setting
SFF	STIFF : Rigidity Monitor/Reservation
SGI	IN1 : SGDH Input Signal Monitor
SGO	OUT1 : SGDH Side Output Signal Monitor
SGT	SVTYPE : SGDH Type Code Display
SGV	SVVER : SGDH Software Version Display
SGY	SVYSPEC : SGDH Y Spec. No. Display
SVO	SVON/SVOFF : Servo ON / OFF
TRMS	TRMS : Total Load ratio Monitor
ZI	ZONEINIT : ZONE Table Initialization
ZN	ZONENT : Zone negative position limit
ZP	ZONEPT : Zone positive position limit
ZS	ZONESTORE : ZONE Table Save

NS600 command mnemonics in alphabetical order:

NS600	NS600 Function	G3
ABSPGRES	Absolute PG Reset	ABS
ACC	Acceleration Reservation	ACC
ALM	Alarm or Warning Read	ALM
ALMn	Alarm History Read	ALMH
ALMTRCCLR	Alarm Trace Clear	ATC
ARES	Alarm Reset	ALR
CURZERO	Motor Current Zero Adjustment	CZE
DBRMS	DB Load Ratio Monitor	DBM

DEC	Deceleration Reservation	DEC
ERR	Error Read	ERR
EVTIME	Program Lapse of Time Monitor	PGZ
HOLD	Positioning Interruption	POY
IN1	SGDH Input Signal Monitor	SGI
IN2	NS600 Input Signal Monitor	NSI
IN2TEST	NS600 Input Signal Reservation	NSJ
INERTIA	Auto-tuning Inertia Display	ATI
JOGN	Jog Reverse	JGN
JOGP	Jog Forward	JGP
JSPDINIT	JOG Speed Table Initialization	JSI
JSPDSTORE	JOG Speed Table Save	JSS
JSPDT	Jog speed reservation	JSR
LOOP	Program Pass Through Monitor	PGQ
LOOPT	Program Table LOOP Read-Write	PGL
MLTLIMSET	Multi Turn Limit Setting	MLS
MON1	PUN Current Issue Position	MON1
MON2	PER Position Error	MON2
MON3	NFB Motor Speed	MON3
MON4	NREF Speed Reference	MON4
MON5	TREF Torque Reference	MON5
MON6	STS Status Flag	MON6
MON7	PFB Current Motor Position	MON7
MON8	POS Target Position	MON8
MON9	DST Target Distance	MON9
MON10	RPOS Registration Target Position	MON10
MON11	RDST Registration Target Distance	MON11
MTSIZE	Motor Capacity Display	MSZ
MTTYPE	Motor Type Display	MTD
NEXTT	Program Table NEXT Read-Write	PGN
OUT1	SGDH Side Output Signal Monitor	SGO
OUT2	NS600 Side Output Signal Monitor	NSM
OUT2TEST	NS600 Output Signal Reservation	NSR
PGMINIT	Program Initialization	PGI
PGMRES	Program Reset	PGR
PGMSTEP	Program Pass Through Monitor	PGP
PGMSTORE	Program Table Save	PGV
PGTYPE	PG Type Display	PT
PGVER	PG Software Version Display	PV
POSA	Target Position Reservation	POT
POSI	Target Position Reservation	POU
POST	Read Program Table Position Function	PTRF
POST	Read Program Table Position Value	PTRV

POST	Send PTWA+PTWB <Data=Table Position>	PTWS
POST	Write Program Table Position Function	PTWF
POST	Write Program Table Position Value	PTWV
PRM	Parameter Read - Write	PAR
PRMINIT	Parameter Initialization	PAI
RDST	Registration Distance Reservation	RRD
RDSTT	Program Table Register Distance	PGA
RES	Reset	RST
RGRM	Regenerative Load Ratio Monitor	RGM
RJOGN	Jog Reverse with Registration	RJR
RJOGP	Jog Forward with Registration	RJF
RS	Position Start with Registration	PRS
RSA	Position Start with Registration	PRA
RSI	Position Start with Registration	PRR
RSPD	Registration Speed Reservation	RRS
RSPDT	Program Table Register Speed	PGB
SKIP	Positioning Stop	POX
SPD	Positioning Speed Reservation	PRV
SPDT	Program Table Position Speed	PGC
ST	Positioning Start	POS
STA	Positioning Start Absolute	POA
START	Program Operation Restart	PGT
STARTsss	Program Operation Start	PGS
STI	Positioning Start Relative	POR
STIFF	Rigidity Monitor/Reservation	SFF
STOP	Program Operation Interruption	PGY
SVON/SVOFF	Servo ON / OFF	SVO
SVTYPE	SGDH Type Code Display	SGT
SVVER	SGDH Software Version Display	SGV
SVYSPEC	SGDH Y Spec. No. Display	SGY
TRM	Temporary Parameter Write	PAT
TRMS	Total Load ratio Monitor	TRMS
TUNESTORE	Auto-tuning Inertia Save	ATS
TYPE	NS600 Type Code Display	NST
VER	NS600 Software Version Display	NSV
YSPEC	NS600 Y Spec. No. Display	NSY
ZONEINIT	ZONE Table Initialization	ZI
ZONENT	Zone negative position limit	ZN
ZONEPT	Zone positive position limit	ZP
ZONESTORE	ZONE Table Save	ZS
ZRN	Homing Start Execution	HOM
ZSET	Coordinates Setting	SET

General Considerations

Communication parameters:

Parameter 800H: The system programmer must set this via the Indexer software to the proper value (0 (RS422), 1 (RS232), or 2 (RS485)) for the type of connection. It is not possible for this value to be changed using the driver.

Parameter 801H: The system programmer must set this via the Indexer software to the proper value (0 (9600), 1 (19200), 2 (38400)) for the desired baud. It is not possible for this value to be changed using the driver.

Parameter 802H: The driver uses the Temporary Parameter Write to set this value to 1, automatically. This ensures that the driver always receives an OK in response to a write command. It is not possible to change this using the driver.

Data Formats:

Some operations require a number to be sent in order to select the proper value. This number is always selected when the item is configured.

Some read operations, such as ALM, return ASCII characters rather than numerical values. In such cases, each ASCII character will be one byte in the four-byte response. For example, a response to ALM could be a hexadecimal value 502D4F54, indicating the response P-OT.

ALM, ALMH, and ERR always return ASCII data as described above.

NEXTT – Will return either the numerical value or Hex 454E44 ("END")

IN1, IN2, OUT1, OUT2, and MON6 return bit values. For example, if /S-On and P-OT is set and an IN1 is performed, the return value will be 5 (binary 101).

MTSIZE, MTTYPE, TYPE, VER, PGTYPE, PGVER, SVTYPE, and SVVERSION return Hexadecimal data.

PRM and TRM use signed decimal, unsigned decimal, or hexadecimal values depending on the parameter selected. Refer to the NS600 manual for details.

All other reads are decimal values, signed or unsigned as appropriate.

In general, write operations use the above formats.

Note that IN2TEST will use only the lower 8 bits of the data, and OUT2TEST will use only the lower 6 bits of the data.

Basic Operation Commands and Moving Commands to the indexer are executed whenever a write operation is performed. With the exception of SVON (Servo ON) and SVOFF (Servo OFF), the value of the data is irrelevant, performing a write operation will execute the command. For SVON / SVOFF, a zero (0) value will execute Servo OFF. Any other value will execute Servo ON.

All other writes use the current data in the configured item.

NOTES:
The driver does not attempt to validate either parameter selection or data values except as controlled by the configuration software. It is the responsibility of the programmer to guarantee that only proper values are used.

USING POSTnnn (PTRF, PTRV, PTWS, PTWF, PTWV)

POST to G3 Data Values

POST Function	NS600 Command Text	G3 Function Value
No Reservation	(Read << spaces) (Write >> -)	0
Relative Position	I<value>	1
Absolute Position	A<value>	2
STOP	STOP	3
Jog Forward	+Infinite	4
Jog Reverse	-Infinite	5

The programmer selects the desired table position when configuring **PTRF**, **PTRV**, **PTWF**, and **PTWV**. All 128 **PTW**x's are independent for each device.

PTRF – Contains the table's "G3 Function Value" of the NS600 Function.
PTRV – Contains a numeric value for the item. This will be set to 0 for "No Reservation" or STOP, + or - 2147483647 for the corresponding Jog, or the received value for the Relative and Absolute reservation positions.

PTWF – Load with the "G3 Function Value" for the POST function desired.
PTWV – Load with the desired position for Relative or Absolute positions.

PTWS – Set **PTWS** to the desired table position to send the appropriate string for the **PTWF** assigned to that position. That is, **PTWS** will send the Command Text above, with <value> set to **PTWV**. The value in **PTWV** is ignored when sending "G3 Function Values" 0, 3, 4, and 5.

Cable Information

G3 RS232 Port	NS600 CN6 232 Port
TxD – 5	RxD – 4
RxD – 2	TxD – 2
0V – 3 and/or 4	14

G3 RS485 Port	NS600 CN6 422 Port
TxA – 2	*RxD – 4
TxB – 1	RxD – 3
RxA – 3	*TxD – 2
RxB – 4	TxD – 1
0V – 6	14

G3 RS485 Port	NS600 CN6 485 Port
TxA – 2 + RxA – 3	*TxD – 2 + *RxD – 4
TxB – 1 + RxB – 4	TxD – 1 + RxD – 3
0V – 6	14

NOTE: For a single axis 485 connection, connect 6 to 7 on the NS600 CN6 port. Terminate multi-axis connections as recommended by the manufacturer.