

Type explanation
 rising edge action will be executed on rising edge. Note: Some coils are overlaid with a readable state value, you are not able to read the last written value there.
 bool action will be enabled on writing 1 and disabled on writing 0
 string 2 characters per register, end marked by 0 byte unless all bytes are used
 int32 1st register contains lower bytes, 2nd contains upper byte

read only access
 read/write access

1 Bit coils

Category	Address	Count	Access	Action Type	Description	Notes
	First	Last				
I/O	200	299	100	RO/RW	Gsig	
	300	363	64	RO/RW	DOut	
	364	427	64	RO	DIn	

16 Bit input registers (read only)

Category	Address	Count	Type	Precision	Description	Notes
	First	Last				
Software Info	0	1	uint16		Software ID	CProg=902, TinyCtrl=980
	1	1	uint16		Software version major	e.g. 12
	2	1	uint16		Software version minor	e.g. 6
	3	1	uint16		Modbus Mapping Version	See top left corner of this document
Statistics	4	5	2 uint32	minutes	Uptime complete	
	6	7	2 uint32	minutes	Uptime last	
	8	9	2 uint32	minutes	Uptime enabled	
	10	11	2 uint32	minutes	Uptime motion	
	12	1	uint16		Program starts	
	13	1	uint16	0.1ms	Cycle time target	
	14	1	uint16	0.1ms	Cycle time max (last 50 cycles)	
	15	1	uint16	0.01Hz	Cycle frequency (average)	
	16	1	uint16	0.01%	Work load	TC: Load of kinematics loop, CProg/IRC: Load of entire application

16 Bit holding registers (read + write access)

Category	Address	Count	Type	Precision	Description	Notes
	First	Last				
I/O	200	206	7	Bitfield	Gsig	
	207	210	4	Bitfield	Dout	

Category	Address	Count	Type	Precision	Description	Notes
	First	Last				
Configuration Info	10	1	RO		Has robot axis	
	11	1	RO		Has external axis	
	12	1	RO		Has gripper axis	
	13	1	RO		Has platform axis	
	14	1	RO		Has I/O module	
Error and State Info	20	1	RO		Module - No error	Combined error codes of all joints
	21	1	RO		Module error - Temperature	
	22	1	RO		Module error - Estop / Low voltage	
	23	1	RO		Module error - Motor not enabled	
	24	1	RO		Module error - Communication	
	25	1	RO		Module error - Position lag	
	26	1	RO		Module error - Encoder error	
	27	1	RO		Module error - Overcurrent	
	28	1	RO		Module error - Driver error	
	29	1	RO		Module error - Bus dead	
	30	1	RO		Module error - Module dead	
	31	36	6	RO	Module error - reserved for future use	
	37	1	RO		Kinematics - No error	More details in register
	38	1	RO		Kinematics - Joint limit min	Kinematics - Error code
	39	1	RO		Kinematics - Joint limit max	
	40	1	RO		Kinematics - Center singularity	
	41	1	RO		Kinematics - Out of Reach	
	42	1	RO		Kinematics - Wrist singularity	
	43	1	RO		Kinematics - Virtual box reached	
	44	1	RO		Kinematics - Motion not allowed	
	45	49	5	RO	Kinematics - reserved for future use	
	92	1	uint16	0.01V	Voltage	
	93	1	uint16	mA	Current total	
	94	1	uint16	0.1%	Battery charge	only CProg/IRC
	95	1	enum		Kinematics - Error code	

Category	Address	Count	Type	Precision	Description	Notes
	First	Last				
Configuration Info	20	1	uint16		Count of robot joints	0-6
	21	1	uint16		Count of external axes	0-3
	22	1	uint16		Count of gripper joints	0-3
	23	1	uint16		Count of platform axes	0-4
	24	1	uint16		Count of I/O modules	0-3

Category	Address	Count	Type	Precision	Description	Notes	
	First	Last					
Connection etc.	50	1	RO/RW	rising edge	Is Connected / Connect / Disconnect	Connect/Disconnect only CProg/IRC	
	51	1	RW	rising edge	Shutdown computer (power off)		
	52	1	RW	rising edge	Reset		
	53	1	RO/RW	rising edge	Is Enabled / Enable / Disable	TinyCtrl: Enable implies reset	
	54	1	RO		Is operating okay	true if opMode=standard	
Referencing	60	1	RO/RW	rising edge	Is referenced / reference all		
	61	66	6	RO/RW	rising edge	IsRefd / reference robot joint	
	67	69	3	RO/RW	rising edge	IsRefd / reference external joint	
	70	72	3	RO/RW	rising edge	IsRefd / reference gripper joint	
	73	1	RW	rising edge	Set all joints to zero		
	74	1	RW	rising edge	Start referencing program, then reference all	Since V13-040, must be ref'd and enabled	
Position + Motion	100	1	RW	rising edge	Start MoveTo cart		
	101	1	RW	rising edge	Start MoveTo cart relative base		
	102	1	RW	rising edge	Start MoveTo cart relative tool		
	103	1	RW	rising edge	Start MoveTo joint		
	104	1	RW	rising edge	Start MoveTo joint relative		
	105	1	RW	rising edge	Start MoveTo platform pos	not implemented	
	106	1	RW	rising edge	Start MoveTo platform pos+ori	not implemented	
	130	135	6	int32	0.01mm	Current position cartesian	Target position cartesian
	136	141	6	int32	0.01°	Current orientation cartesian	Target orientation cartesian
	142	153	12	int32	0.01 units	Current position robot joints	Target position robot joints
	154	159	6	int32	0.01 units	Current position external axis	Target position external axis
	160	165	6	int32	0.01 units	Current position gripper joints	
	174	177	4	int32	0.01mm	Current position platform cartesian	Target position platform cartesian
	178	179	2	int32	0.01°	Current orientation platform cartesian	Target orientation platform cartesian
	180	1	int16	0.1% / 0.1mm/s		Velocity for MoveTo	not implemented
	181	186	6	int32	0.1unit/s		Target velocities external axes in velocity mode
	187	1	uint16	0.01%		Override	
	188	1	enum			Jog mode	Joint=0, CartBase=1, CartTool=2, Plattform=3, invalid=0xffff
Program	260	1	enum			Program RunState	NotRunning=0, Running=1, Paused=2
	261	1	enum			Replay Mode	Single=0, Repeat=1, Step=2, Fast=3 (not used)
	262	1	uint16		Loaded robot programs count	Main program + number sub programs	
	263	1	int16		Current robot program number	starts at 0 (= main program)	
	264	1	uint16		Count of commands in current program		
	265	1	int16		Current command number		
	266	1	enum		Reason for last program stop/pause	-1 (0xffff) when not running see enum IPO Stop Reason	
	267	298	32	string		Name of loaded robot program / load robot program	Up to 64 ASCII characters
	299	330	32	string		Name of loaded logic program / load logic program	Up to 64 ASCII characters

Category	Address	Count	Type	Precision	Description	Notes	
	First	Last					
Temperature	44	49	6	int16	0.1°C	Temperatures of robot joint electronics	
	50	52	3	int16	0.1°C	Temperatures of external axis electronics	
	53	55	3	int16	0.1°C	Temperatures of gripper joint electronics	
	56	59	4	int16	0.1°C	Temperatures of platform axis electronics	
	60	65	6	int16	0.1°C	Temperatures of robot joint motors	not implemented
	66	68	3	int16	0.1°C	Temperatures of external axis motors	not implemented
	69	71	3	int16	0.1°C	Temperatures of gripper joints motors	not implemented
	72	75	4	int16	0.1°C	Temperatures of platform axis motors	not implemented
	76	81	6	uint16	mA	Currents of robot joints	
	82	84	3	uint16	mA	Currents of external axes	
	85	87	3	uint16	mA	Currents of gripper joints	
	88	91	4	uint16	mA	Currents of platform axis	
	92	1	uint16	0.01V	Voltage		
	93	1	uint16	mA	Current total		
	94	1	uint16	0.1%	Battery charge	only CProg/IRC	
	95	1	enum		Kinematics - Error code		

Program selection	130	1 RW	rising edge	Next directory entry	only TinyCtrl	331	1	uint16	Count of entries in current directory	only TinyCtrl							
	131	1 RW	rising edge	Previous directory entry	only TinyCtrl	332	1	uint16	Number of the selected directory entry	0-??; if current dir is not the base dir entry 0 is ".,/"; only TinyCtrl	332	1	uint16	Number of the selected directory entry	0-??; if current dir is not the base dir entry 0 is ".,/"; only TinyCtrl		
	132	1 RW	rising edge	Is directory entry a file? (Does not validate contents)	only TinyCtrl	333	364	32	string	Name of the selected directory entry	Up to 64 ASCII characters, only TinyCtrl						
	133	1 RW	rising edge	Load selected program / open selected directory	only TinyCtrl	365	396	32	string	Name of the current directory	Up to 64 ASCII characters, only TinyCtrl						
	134	1 RW	rising edge	Go to base directory (../Data/Programs)	only TinyCtrl												
	135	1 RW	rising edge	Unload robot program													
136	1 RW	rising edge	Unload logic program														
Teach programming	140	1 RW	rising edge	Save program	only CPRog/IRC												
	141	1 RW	rising edge	Remove last command (from main program)	only CPRog/IRC												
	142	1 RW	rising edge	Add joint command (current position, MoveTo velocity)	only CPRog/IRC												
	143	1 RW	rising edge	Add linear command (current position, MoveTo velocity)	only CPRog/IRC												
Info message					400	431	32	string	Info/error message short (same as shown on teach pendant)	Up to 64 ASCII characters							
Program variables						440	455	16	int16	Readable number variables mb_num_r1 - mb_num_r16	1 register per variable, value is rounded to next integer	440	455	16	int16	Writable number variables mb_num_w1 - mb_num_w16	1 register per variable, value is rounded to next integer
						456	711	256	int16	Readable position variables mb_pos_r1 - mb_pos_r16	16 registers per variable: see enum conversion type	456	711	256	int16	Writable position variables mb_pos_w1 - mb_pos_w16	16 registers per variable: see enum conversion type

