Technical Note 021

580 series Modbus backwards compatibility

Allowing the 580 to match the 550

The 580 series has a backwards compatibility mode, called Legacy Modbus Mapping, for the Modbus RTU and Modbus TCP communication protocols. In this mode, the 580 will appear as a 550 over Modbus communication. The compatibility mode covers the most commonly used parameters and data points. This document identifies the Legacy Modbus Mapping compatibility mode parameter, along with which parameters and data points are supported in this mode. The 550 series is made up of the ACH550, ACQ550, and ACS550. The 580 series is made up of the ACH580, ACQ580, and ACS580. This document is not valid for ACH configurations that include E-Clipse bypass.

This compatibility mode feature is useful in retrofit applications, such as where an existing ACH550 is replaced with an ACH580, and the existing ACH550 was controlled and/or monitored via Modbus RTU or Modbus TCP. In most applications, enabling the use of Legacy Modus Mapping mode, by setting 580 parameter 96.78 to [1] Enabled, along with selecting the correct Legacy Control Profile in 96.79, eliminates the need to modify the existing PLC (programmable logic controller) code to support the 580. Legacy mode has 580 Modbus scaling match the 550 implementation. Table 1 identifies which parameters/registers are supported in compatibility mode, along with which parameters/registers support read-only versus read/write functionality. Note that compatibility mode does not cover 100% of the parameters from the 550 series.

As an example, assume a PLC was communicating via Modbus RTU to an ACH550-UH-015A-4 drive, and now the drive is being replaced with an ACH580-01-014A-4. The PLC was monitoring Output frequency via register 40103 on the ACH550. However, register 40103 on the ACH580 indicates Motor speed %, and the ACH580 instead has register 40106 as Output frequency.

- Option 1 – Reprogram the PLC to monitor register 40106 on the ACH580, allowing the PLC to monitor Output frequency on the ACH580.
- Option 2 – Enable Legacy Modbus Mapping parameter 96.78 in the ACH580 drive. Then set Legacy Control Profile parameter 96.79 to match the appropriate control profile from the ACH550 drive (parameter 5305). Now register 40103 is still used to monitor Output frequency in the ACH580.

Note: Parameter 96.79 is available in ACH580 firmware version 2.12.0.3 or later. If a 580 series drive does not have parameter 96.79, then the control profile used defaults the profile identified in parameter 58.25.

Table 1 550 series parameters/registers supported by the 580 series backwards compatibility mode

550 series parameter/ register	Name	Read/Write
1	ABB DRIVES & ABB DRIVES LIMITED CONTROL WORD	Read/Write
2	ABB DRIVES, ABB DRIVES LIMITED, DCU PROFILE REFERENCE 1	Read/Write
4	ABB DRIVES & ABB DRIVES LIMITED STATUS WORD	Read Only
31	DCU CONTROL WORD (LSW)	Read/Write
32	DCU CONTROL WORD (MSW)	Read Only
33	DCU STATUS WORD LSW	Read Only
34	DCU STATUS WORD MSW	Read Only
01.01	SPEED & DIR	Read Only
01.02	SPEED	Read Only
01.03	OUTPUT FREQ	Read Only
01.04	CURRENT	Read Only
01.05	TORQUE	Read Only
01.06	POWER	Read Only

550 series parameter/ register	Name	Read/Write
01.07	DC BUS VOLTAGE	Read Only
01.09	OUTPUT VOLTAGE	Read Only
01.10	DRIVE TEMP	Read Only
01.11	EXTERNAL REF 1	Read Only
01.13	CTRL LOCATION	Read Only
01.14	RUN TIME	Read Only
01.15	KWH COUNTER	Read Only
01.18	DI 1-3 STATUS	Read Only
01.19	DI 4-6 STATUS	Read Only
01.20	AI 1	Read Only
01.21	AI 2	Read Only
01.22	RO 1-3 STATUS	Read Only
01.23	RO 4-6 STATUS	Read Only
01.24	AO 1	Read Only
01.25	AO 2	Read Only
01.26	PID 1 OUTPUT	Read Only
01.27	PID 2 OUTPUT	Read Only
01.28	PID 1 SETPNT	Read Only
01.29	PID 2 SETPNT	Read Only
01.30	PID 1 FBK	Read Only
01.31	PID 2 FBK	Read Only
01.32	PID 1 DEVIATION	Read Only
01.33	PID 2 DEVIATION	Read Only
01.34	COMM RO WORD	Read Only
01.35	COMM VALUE 1	Read Only
01.36	COMM VALUE 2	Read Only
01.41	MWH COUNTER	Read Only
01.43	DRIVE ON TIME	Read Only
01.45	MOTOR TEMP	Read Only
01.50	CB TEMP	Read Only
01.74	SAVED KWH	Read Only
01.75	SAVED MWH	Read Only
01.77	SAVED AMOUNT 2	Read Only
01.78	SAVED CO2	Read Only
03.01	FB CMD WORD 1	Read Only
03.02	FB CMD WORD 2	Read Only
03.03	FB STS WORD 1	Read Only
03.04	FB STS WORD 2	Read Only
03.05	FAULT WORD 1	Read Only
03.06	FAULT WORD 2	Read Only
03.07	FAULT WORD 3	Read Only

550 series parameter/ register	Name	Read/Write
03.08	ALARM WORD 1	Read Only
03.09	ALARM WORD 2	Read Only
04.01	LAST FAULT	Read Only
04.12	PREVIOUS FAULT 1	Read Only
04.13	PREVIOUS FAULT 2	Read Only
10.01	EXT1 COMMANDS	Read/Write
10.02	EXT2 COMMANDS	Read/Write
10.03	DIRECTION	Read/Write
10.04	JOGGING SEL	Read/Write
11.02	EXT1/EXT2 SEL	Read/Write
11.03	REF1 SELECT	Read/Write
11.04	REF1 MIN	Read/Write
11.05	REF1 MAX	Read/Write
11.06	REF2 SEL	Read/Write
11.07	REF2 MIN	Read/Write
11.08	REF2 MAX	Read/Write
12.01	CONST SPEED SEL	Read/Write
12.02	CONST SPEED 1	Read/Write
12.03	CONST SPEED 2	Read/Write
12.04	CONST SPEED 3	Read/Write
12.05	CONST SPEED 4	Read/Write
12.06	CONST SPEED 5	Read/Write
12.07	CONST SPEED 6	Read/Write
12.08	CONST SPEED 7	Read/Write
15.02	AO1 CONTENT MIN	Read/Write
15.03	AO1 CONTENT MAX	Read/Write
15.04	MINIMUM AO1	Read/Write
15.05	MAXIMUM AO1	Read/Write
15.08	AO2 CONTENT MIN	Read/Write
15.09	AO2 CONTENT MAX	Read/Write
15.10	MINIMUM AO2	Read/Write
15.11	MAXIMUM AO2	Read/Write
16.01	RUN ENABLE	Read/Write
16.02	PARAMETER LOCK	Read/Write
16.03	PASS CODE	Read/Write
16.08	START ENABLE 1	Read/Write
16.09	START ENABLE 2	Read/Write
20.01	MINIMUM SPEED	Read/Write
20.02	MAXIMUM SPEED	Read/Write
20.03	MAX CURRENT	Read/Write
20.06	UNDERVOLT CRTL	Read/Write

550 series parameter/ register	Name	Read/Write
20.07	MINIMUM FREQ	Read/Write
20.08	MAXIMUM FREQ	Read/Write
20.13	MIN TORQUE SEL	Read/Write
20.14	MAX TORQUE SEL	Read/Write
20.15	MIN TORQUE 1	Read/Write
20.16	MIN TORQUE 2	Read/Write
20.17	MAX TORQUE 1	Read/Write
20.18	MAX TORQUE 2	Read/Write
21.02	STOP FUNCTION	Read/Write
21.03	DC MAGN TIME	Read/Write
21.05	DC HOLD SPEED	Read/Write
21.06	DC CURR REF	Read/Write
21.09	EMERG STOP SEL	Read/Write
21.12	ZERO SPEED DELAY	Read/Write
21.13	START DELAY	Read/Write
22.02	ACCELER TIME 1	Read/Write
22.03	DECELER TIME 1	Read/Write
22.04	RAMP SHAPE 1	Read/Write
22.05	ACCELER TIME 2	Read/Write
22.06	DECELER TIME 2	Read/Write
22.07	RAMP SHAPE 2	Read/Write
22.08	EMERG DEC TIME	Read/Write
23.01	PROP GAIN	Read/Write
23.02	INTEGRATION TIME	Read/Write
23.03	DERIVATION TIME	Read/Write
23.04	ACC COMPENSATION	Read/Write
30.02	PANEL COMM ERR	Read/Write
30.03	EXTERNAL REF 1	Read/Write
30.04	EXTERNAL REF 2	Read/Write
30.05	MOT THERM POT	Read/Write
30.06	MOT THERM TIME	Read/Write
30.07	MOT LOAD CURVE	Read/Write
30.08	ZERO SPEED LOAD	Read/Write
30.09	BREAK POINT FREQ	Read/Write
30.10	STALL FUNCTION	Read/Write
30.11	STALL FREQUENCY	Read/Write
30.12	STALL TIME	Read/Write
30.17	EARTH FAULT	Read/Write
30.18	COMM FAULT FUNC	Read/Write
30.19	COMM FAULT TIME	Read/Write
30.22	AI2 FAULT LIMIT	Read/Write

550 series parameter/ register	Name	Read/Write
30.23	WIRING FAULT	Read/Write
33.01	FIRMWARE	Read Only
33.02	LOADING PACKAGE	Read Only
33.03	TEST DATE	Read Only
33.04	DRIVE RATING	Read Only
40.01	GAIN	Read/Write
40.02	INTEGRATION TIME	Read/Write
40.03	DERIVATION TIME	Read/Write
40.04	PID DERIV FILTER	Read/Write
40.08	0% VALUE	Read/Write
40.09	100% VALUE	Read/Write
40.10	SET POINT SEL	Read/Write
40.11	INTERNAL SETPNT	Read/Write
40.12	SETPOINT MIN	Read/Write
40.13	SETPOINT MAX	Read/Write
40.14	FBK SEL	Read/Write
40.15	FBK MULTIPLIER	Read/Write
40.16	ACT 1 INPUT	Read/Write
40.17	ACT 2 INPUT	Read/Write
40.24	PID SLEEP DELAY	Read/Write
40.25	WAKE-UP DEV	Read/Write
40.26	WAKE-UP DELAY	Read/Write
40.27	PID 1 PARAM SET	Read/Write
41.01	GAIN	Read/Write
41.02	INTEGRATION TIME	Read/Write
41.03	DERIVATION TIME	Read/Write
41.04	PID DERIV FILTER	Read/Write
41.08	0% VALUE	Read/Write
41.09	100% VALUE	Read/Write
41.10	SET POINT SEL	Read/Write
41.11	INTERNAL SETPNT	Read/Write
41.12	SETPOINT MIN	Read/Write
41.13	SETPOINT MAX	Read/Write
41.14	FBK SEL	Read/Write
41.15	FBK MULTIPLIER	Read/Write
41.16	ACT 1 INPUT	Read/Write
41.17	ACT 2 INPUT	Read/Write
41.24	PID SLEEP DELAY	Read/Write
41.25	WAKE-UP DEV	Read/Write
41.26	WAKE-UP DELAY	Read/Write
42.11	INTERNAL SETPNT	Read/Write

550 series parameter/ register	Name	Read/Write
53.05	EFB CTRL PROFILE	Read/Write
99.01	LANGUAGE	Read/Write
99.04	MOTOR CTRL MODE	Read/Write
99.05	MOTOR NOM VOLT	Read/Write
99.06	MOTOR NOM CURR	Read/Write
99.07	MOTOR NOM FREQ	Read/Write

550 series parameter/ register	Name	Read/Write
99.08	MOTOR NOM SPEED	Read/Write
99.09	MOTOR NOM POWER	Read/Write
99.10	ID RUN	Read/Write
99.15	MOTOR COS PHI	Read/Write

Note: certain parameters in the tables may be available in an ACS550 but not in an ACH550.