



Remote Monitoring and Control

DNP-RTM™

ABB PCD Integration Guide

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Revision Log

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3/17/03	1.0	Initial version
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Introduction

Overview

The Telemetric DNP-Remote Telemetry Module (DNP-RTM™) is a cost-effective communications solution for remote monitoring and control of Intelligent Electronic Devices (IEDs) such as the ABB PCD. The DNP-RTM continuously polls the IED through a local serial connection. When a reportable change is detected, the DNP-RTM transmits an event report. This minimizes the cost of communication, yet provides near real-time information. Access to the IED with the DNP-RTM can be gained from the utility's SCADA system by using the Telemetric SCADA-Xchange™.

Integrating the Telemetric DNP-RTM with the ABB PCD provides immediate control and status indication of operating conditions to improve system operation and protect investments.

This integration provides monitoring and control capability over many of the ABB PCD parameters. See Table 1, Table 2 and Table 3 for the monitor and control points provided in this integration.

Make sure you perform the software configuration as detailed in the ABB PCD Programming section of this document.

The PCD will soon be offered with 12VDC available in the enclosure. In the meantime, contact your ABB representative to arrange for a DC supply accessory. Also, the DNP-RTM mounting plate is designed to attach to the ABB enclosure backplate. Make sure the pre-drilled backplate is included in the enclosure, or contact your ABB representative to order it.

Features

Integrating the Telemetric DNP-RTM with the ABB PCD provides remote notification of recloser events and internal parameter status, as well as the ability to open or close the recloser remotely. The following monitor and control points are provided in this integration:

Table 1 – Digital Input Points

Point Number	Point Name	Enabled on RTM	Report on Change	Report Interval	Trigger Time
17	Breaker Closed (3ph mode 52a)				
8	Breaker Open (3ph mode 52b)				
173	A Phase Closed (1ph mode 52aAph)	X	X	24	0
174	B Phase Closed (1ph mode 52aBph)	X	X	24	0
175	C Phase Closed (1ph mode 52aCph)	X	X	24	0
176	A Phase Open (1ph mode 52bAph)	X	X	24	0
177	B Phase Open (1ph mode 52bBph)	X	X	24	0
178	C Phase Open (1ph mode 52bCph)	X	X	24	0
66	Recloser Lockout Alarm (79LOA)	X	X	24	0
146	Remote Block (RBA)	X	X	24	0
149	Recloser Blocked (79DA)	X	X	24	0
147	Ground Block (GRD)	X	X	24	0
169	Hot Line Tag Status (CLSBLK)	X	X	24	0
150	Primary Settings Group	X	X	24	0
152	Alt 1 Settings	X	X	24	0
154	Alt 2 Settings	X	X	24	0
39	Self Check Alarm	X	X	24	0
69	Blown Fuse Alarm (BFUA)	X	X	24	0
21	Breaker Failure Alarm (BFA)	X	X	24	0
145	Loss of AC Alarm (LOAC)	X	X	24	0
40	Ph A Target Alarm (PATA)	X	X	24	0
41	Ph B Target Alarm (PBTA)	X	X	24	0
42	Ph C Target Alarm (PCTA)	X	X	24	0
165	Neutral Target Alarm (NTA)	X	X	24	0
81	Load Current Alarm (LOADA)	X	X	24	0
20	Trip Coil Failure Alarm				
197	LCM Status				
204	LCM Source 1				
205	LCM Source 2				
198	LCM Source 1 Ph A Voltage				
199	LCM Source 1 Ph B Voltage				
200	LCM Source 1 Ph C Voltage				
201	LCM Source 2 Ph A Voltage				
202	LCM Source 2 Ph B Voltage				
203	LCM Source 2 Ph C Voltage				

Table 2 – Analog Input Points

Point Number	Point Name	Enabled On RTM	Report Interval	Low Limit	Mid Limit	High Limit
0	I - Ph A	X	0	N	N	N
1	I - Ph B	X	0	N	N	N
2	I - Ph C	X	0	N	N	N
3	I - Neutral	X	0	N	N	N
4	Van	X	0	N	N	N
5	Vbn	X	0	N	N	N
6	Vcn	X	0	N	N	N
133	Voltage Source 1 - Ph A	X	0	N	N	N
135	Voltage Source 1 - Ph B	X	0	N	N	N
137	Voltage Source 1 - Ph C	X	0	N	N	N
139	Voltage Source 2 - Ph A	X	0	N	N	N
141	Voltage Source 2 - Ph B	X	0	N	N	N
143	Voltage Source 2 - Ph C	X	0	N	N	N
87	UPS Battery Voltage	X	0	N	N	N
88	UPS Battery Charge Current (A)		0	N	N	N
89	UPS Battery Temperature ©		0	N	N	N
90	UPS Battery Test - DeltaV	X	0	N	N	N
126	Last Fault - Fault Location (mi)	X	0	N	N	N
95	Last Fault - Year	X	0	N	N	N
96	Last Fault - Month	X	0	N	N	N
97	Last Fault - Day	X	0	N	N	N
98	Last Fault - Hour	X	0	N	N	N
99	Last Fault - Minute	X	0	N	N	N
100	Last Fault - Second	X	0	N	N	N
101	Last Fault - Millisecond	X	0	N	N	N
102	Last Fault - Phase A Current	X	0	N	N	N
103	Last Fault - Phase B Current	X	0	N	N	N
104	Last Fault - Phase C Current	X	0	N	N	N
105	Last Fault - Neutral Current	X	0	N	N	N
51	Demand IA	X	0	N	N	N
52	Demand IB	X	0	N	N	N
53	Demand IC	X	0	N	N	N
54	Demand I Neutral	X	0	N	N	N
63	Max IA	X	0	N	N	N
64	Max IB	X	0	N	N	N
65	Max IC	X	0	N	N	N
66	Max I Neutral	X	0	N	N	N
10	3-Phase KW	X	0	N	N	N
14	3-Phase KVAR	X	0	N	N	N
47	Frequency	X	0	N	N	N
48	PF	X	0	N	N	N
131	Unit Serial Number	X	0	N	N	N

Table 3 – Digital Output Points

Point Number	Point Name	Enabled on RTM
36	Reset Alarms and Targets	X
96	LCM Reset	
97	LCM Source I Enable	
98	LCM Source I Disable	
99	LCM Source II Enable	
100	LCM Source II Disable	
58	Ph A - Trip	X
61	Ph A - Close	X
59	Ph B - Trip	X
62	Ph B - Close	X
60	Ph C - Trip	X
63	Ph C - Close	X
56	Hot Line Open Tag	X
52	Ground Block	X
54	ALT 1 Settings	X
55	ALT 2 Settings	X
32	Trip - 3 Ph	
33	Close - 3 Ph (dependent on 43a)	
35	Close - 3 Ph (independent of 43a)	
51	Reclose Block	X
37	Reset I-Peak and I-Min Demand	X
41	Initiate UPS Test	X

Points can be enabled or disabled using the Telemetric web site interface or the Telemetric local configuration program provided with the DNP-RTM. The other settings for the DNP points, such as report interval or trigger time, can be changed only by using the local configuration program. See Appendix A in the DNP-RTM Users' Guide for complete instructions on using the local configuration program.

Safety Information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it. We strongly urge that you follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment.

A competent technician has these qualifications:

- *Is thoroughly familiar with these instructions.*
- *Is trained in industry-accepted high-voltage and low-voltage safe operating practices and procedures.*
- *Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.*
- *Is trained in the care and use of protective equipment such as flash clothing, safety glasses, face shield, hard hat, rubber gloves, hotstick, etc.*

The following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Following are general caution and warning statements that apply to this equipment.

WARNING: *This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage.*

DANGER: *Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high and low voltage lines and equipment.*

WARNING: *Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling or maintenance can result in death, severe personal injury, and equipment damage.*

WARNING: *Power distribution equipment must be selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain this equipment can result in death, severe personal injury, and equipment damage.*

Integration Parts List

Please verify that all the parts pictured in Figure 1 and listed in Table 4 are provided in the Integration Kit.

Table 4 - Integration kit parts list. Telemetric part number DNP/PCD2000 INTG KIT.

<i>Description</i>	<i>Quantity</i>
Plate, ABB PCD2000 DNP	1
Size 4 kepnut	4
Size 6 kepnut	2
Size 8 kepnut	2
9 pin Serial Cable, M-M, AE1018	1
Low-profile antenna	1
Antenna Cable, 2', NRG-58-2	1
1-3/4 Reducing Washer	2
Wal-nut	2



Figure 1 - Integration Kit Contents

Installation

Required tools: *Silicone sealant, Phillips screwdriver, small standard screwdriver, nut driver, socket wrench, ¼-inch socket, 11/32-inch socket, 5/16-inch socket and ½-inch socket.*

This installation assumes the ABB enclosure has a backplate. This backplate has several pre-drilled holes that the DNP-RTM mounting plate will attach to.

The DNP-RTM comes with a mounting plate, ready for installation within the ABB PCD. Follow the instructions below to install the DNP-RTM.

- 1) Remove power from the PCD enclosure and disconnect the batteries.
- 2) Remove the nuts holding the backplate inside the PCD enclosure using the socket wrench and the ½-inch socket. Remove the PCD backplate from the enclosure. Locate the two vertically aligned mounting holes on the backplate. These are in the lower-left quadrant of the backplate.
- 3) Insert the two RTM mounting plate studs through these two holes on the backplate, and secure the RTM mounting plate with the two size-8 kepnuts. Tighten with the nut driver and 11/32-inch socket. See Figure 2 for the mounting location of the RTM on the PCD backplate.
- 4) Attach the RTM to the mounting plate using four size-4 kepnuts, the nut driver and the ¼-inch socket.
- 5) Insert the serial cable into the bottom RTM serial port labeled "BOTTOM=IED". Secure the connection by tightening the screw fasteners.



Figure 2 – RTM on PCD backplate

- 6) Reattach the backplate by sliding the backplate into place over the four backplate mounting studs on the back of the PCD enclosure. Reattach the nuts on the backplate studs and tighten with the socket wrench and ½-inch socket.
- 7) To mount the antenna on the bottom of the enclosure:
 - a) Remove the cover plate on the bottom of the enclosure to expose the 1-3/8-inch knockout that will be used for the antenna.
 - b) Use the provided 1-3/4 reducing washers to reduce the knockout to the appropriate 1-inch hole size when attaching the antenna.
 - c) Remove the large lock-washer and nut from the antenna that came with the integration kit.
 - d) Insert the antenna into the hole, keeping the rubber seal on the outside of the enclosure and placing one reducing washer between the rubber seal on the antenna and the enclosure wall on the outside of the enclosure.
 - e) Place the other reducing washer on the inside of the enclosure, directly against the enclosure wall.
 - f) Secure the antenna by screwing the lock-washer and nut onto the antenna from the inside of the enclosure
 - g) Screw the antenna cable into the antenna. Screw the other end onto the DNP-RTM radio where it protrudes through the DNP-RTM enclosure as shown in Figure 3.
- 8) Plug the serial cable into the PCD RS-232 port on the PCD COM (Type 3 or Type 4).
- 9) Using the standard screwdriver and the power pigtail, insert the red DC wire into P1 on the DIN rail terminal board mounted on the left of the enclosure. You will need the screwdriver to insert into the square hole adjacent to the round wire hole. This will open the retainer mechanism in the wire hole so you can insert the wire. Insert the black DC wire into N on the terminal block.
- 10) Plug the RTM power connector into the RTM power receptacle.



Figure 3 - RTM Mounted

ABB PCD Programming

To edit PCD parameter values, you may need to provide the PCD password. Make sure you have the passwords for your system before attempting to make any parameter changes.

Make the following changes using the PCD front panel display. The PCD configuration software could also be used to make these changes.

- Navigate to the **Communications** menu by pressing the **Enter** button, then scroll down once to the **Settings** selection. Press **Enter**, scroll down once to **Change Settings** and press **Enter** to select. Scroll down to **Communications** and press **Enter** to select. A password will probably be needed to proceed.
- Note the **Unit Address** value. This will be used to set the RTM DNP Slave Address later.
- Scroll down to the **RP Baud** setting and note the value, this will be used to program the RTM Baud rate later (The default RTM Baud is 9600).
- Scroll down to the next parameter and note the **RP Frame** setting. Make sure this value is set to **N, 8, 1**.
- Scroll down to the next parameter and note the **RP Protocol** setting. Make sure this value is set to **DNP3.0**.
- Scroll down to **Parameter 5** and set to a value of **255**. This will enable a block of scan groups in the PCD.
- Scroll down to **Parameter 6**, **Parameter 7** and **Parameter 8** and set all of them to a value of **255** to enable the remaining scan groups.
- Scroll down to **Parameter 12** and make note of this parameter. It will be used to set the RTM DNP Master Address later.
- Scroll down to **Parameter 22** and make sure this parameter is set to a value of **1** to enable 32-bit DNP analogs.

DNP-RTM Programming

You will need to use the DNP-RTM local programming utility to properly set the device baud rate and the master/slave addresses. On the ABB PCD, find and record the Baud and Slave Address as described in the ABB PCD Programming section of this document. Make the following changes in the DNP-RTM Configuration program:

- Set the **Master** address to match the **Parameter 12** value.
- Set the **Slave** address to match the **Unit Address** value.
- Set the **Baud Rate** to match the **RP Baud** value.

The local programming utility is included on the Telemetric CD provided with the DNP-RTM device. Reference the DNP-RTM Users' Guide for instructions on interfacing to a device locally.

Additional Information

Product manuals, installation manuals, application notes, application guides and technical specifications are available for download at the Telemetric web site.

http://www.telemetric.net/front_end/documentation.htm

For more information, questions or feedback, please feel free to contact Telemetric technical support.

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