Technical Reference Manual TransPondIT® for Itron® CENTRON® Solid State Electric Meter

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OVERVIEW

About RAMAR®

RAMAR is a global provider of automatic meter reading (AMR) systems for the utility industry. Through worldwide license and distribution agreements, RAMAR's powerful product solutions enable water, gas, and electric utilities to improve customer service, cost-efficiency, and meter reader safety through the use of state-of-the-art automation systems. The company's comprehensive product portfolio includes basic data capture devices for mobile meter reading, sub-metering, and customized two-way fixed network system solutions.

RAMAR is a designer and supplier of radio frequency based (RF) AMR systems. RAMAR's focus is on developing cutting-edge products for the AMR market. RAMAR specializes in hand-held and mobile automatic meter reading, with a wide range of uses. Standard interfaces and protocols enable products to integrate with popular meters, hand-held computers, billing systems and route management software.

About TransPondIT®

The TransPondIT is RAMAR's meter interface unit (MIU), which allows utilities to receive data from a meter remotely. The TransPondIT collects data from the meter and transmits it by radio to a receiver and data collection device that is either mobile or fixed.

About CENTRON® Meter

The CENTRON Meter is a solid-state electric meter produced by Itron (formerly Schlumberger Electricity, Inc.).

Features of TransPondIT for CENTRON Meter

- Highly integrated product means competitive cost with strong features.
- No interrogation signal required to 'wake-up' TransPondITs.
- No FCC license required.
- Easy, "under-the-glass" installation.
- No battery required - power taken from mains via the meter's metrology board.
- Meter readings and configuration designed to be unaffected by power surges, brownouts or other interruptions.
- Programmable display options.
- LCD segment check.
- Detent and non-detent programming options.
- No loss of partial KWh consumption or configuration data during power outages.
- Tilt Switch (option).
- Programmable ID number
- Roll over after 99,999 kWh

PREFACE

What is the purpose of this manual?

This manual is intended to provide technical reference on the TransPondIT for CENTRON Meter for meter shop personnel and those planning the meter reading process. It includes information required by the meter shop to install and configure a solid state Electric TransPondIT in a CENTRON meter.

Before attempting any installation, testing, or operation of the unit, read this entire manual.

A RAMAR Quick Reference Guide is also available which covers the 900 series TransPondIT, ConFigIT, FastTrackIT® and HandTrackIT®. Contact your RAMAR distributor for a copy of this guide.

Who do I contact if I have a question?

Questions not covered by this manual should be directed to your RAMAR distributor. If a distributor is not available, contact RAMAR directly by calling 1-888-98-RAMAR (72627).

GLOSSARY

AMR	Automatic Meter Reading
ANSI	American National Standards Institute
DFSK	Direct Frequency Shift Keying
ESD	Electrostatic Discharge
FCC	Federal Communications Commission
ID	Identity
ISM	Industrial Scientific Medical
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MIU	Meter Interface Unit
PCB	Printed Circuit Board
RF	Radio Frequency

TABLE OF CONTENTS

CHAPTER 1: GETTING STARTED

This chapter provides an overview of function, meter compatibility and product marking.

1.1 GENERAL

The RAMAR TransPondIT for the CENTRON meter implements the TransPondIT functionality into the Itron (formerly Schlumberger Electricity, Inc.) CENTRON solid state electricity meter. It is a personality module with the functions of meter, register, display and RF Transmitter. The TransPondIT is supplied fitted with the LCD and meter face plate.

Mounting of the TransPondIT in the meter takes only a few seconds and requires no tools and minimal operator training. The TransPondIT is fitted to new or existing meters in utility meter shop or by a 3rd party meter service company. Alternatively, utilities can buy meters with the personality module already installed.

If settings on the TransPondIT need to be modified, an electric ConFigIT is used to reconfigure the TransPondIT prior to sealing the meter.

1.2 METER COMPATIBILITY

The CENTRON meter features several meter bases in a number of form factors. Appendix A includes a table of TransPondIT part numbers used with the various meter form factors. If purchasing meters for fitting TransPondITs, order meters without the standard personality module (C1SX). Qualification of the meter with TransPondIT fitted is still pending for some form factors.

TransPondITs are available for order with a tilt switch option – refer to your RAMAR representative for availability. The tilt switch reports removal of meter or inverted operation of the meter.

1.3 KIT CONTENTS

The items in the TransPondIT package are:

- TransPondITs
- Sheet of Approvals labels
- Sheet of ‘X10’ labels

1.4 TRANSPONDIT MARKINGS

Figure 1: TransPondIT markings and information

The TransPondIT is identified by a label applied to the meter faceplate. The marking includes:

- RAMAR logo
- Part number
- Serial number
- Bar Code (Serial Number using 128C compression)
- Voltage & frequency rating

1.5 APPROVALS LABEL

The Approvals Label (to be applied to the side of the inner cover) includes:

- FCC identifier and statutory warning
- Canadian radio approval identifier
- Measurement Canada certification number
- ANSI approval

Figure 2: FCC Approval label

CHAPTER 2: INSTALLATION

This chapter provides instructions for the proper installation of the TransPondIT.

2.1 HANDLING PRECAUTIONS

When handling the TransPondIT, grip the circuit board by its edges. **DO NOT touch the LCD display or the electronics components.**

2.2 INSPECTION

Perform the following inspections when you receive the TransPondITs:

- Compare and verify the TransPondIT serial number and part number (see Figure 1) to the packing slip and invoice.
- Inspect for damage to the LCD plastic housing, LCD and PCB.
- Peel off protective strip from LCD.

2.3 METER PREPARATION

Perform any cleaning and preparation to the meter prior to fitting the TransPondIT.

2.4 SAFETY

The TransPondIT is powered via connections to the meter's metrology board. The connection is achieved using a board-to-board connector supplied with the meter.

Do not power the meter from mains without the inner cover in place.

Remove power from the meter before removing the inner cover.

2.5 TRANSPONDIT INSTALLATION

To change or fit the TransPondIT:

1. Remove power from the meter.
2. Remove the outer (polycarbonate or glass) cover (twist off).
3. Remove plastic inner cover by holding the meter with both hands and applying equal pressure on either side of the three and nine-o'clock positions (see Figure 3a). The inner cover is held in place by four plastic tabs on the meter base.
4. With the meter facing the user and the plastic tabs disengaged, tilt the cover away (see Figure 3b).
5. Lift off the meter base taking care not to catch the light pipe. The light pipe could be damaged if you lift the cover straight up (see Figure 3c).

Figure 3a

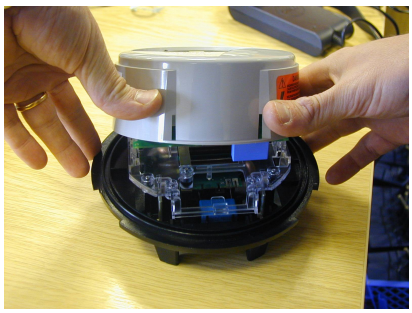


Figure 3b

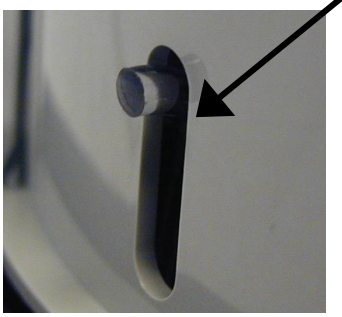


Figure 3c

Figure 3a, 3b, 3c: Removing the inner protective cover

6. Remove the black board-to-board connector between the upper circuit board (if present) and the metrology board. Grasp the board in the middle, lengthwise, and pull out by moving from side-to-side (see Figure 4). To maintain the integrity of the connector, only remove it when fitting TransPondIT.

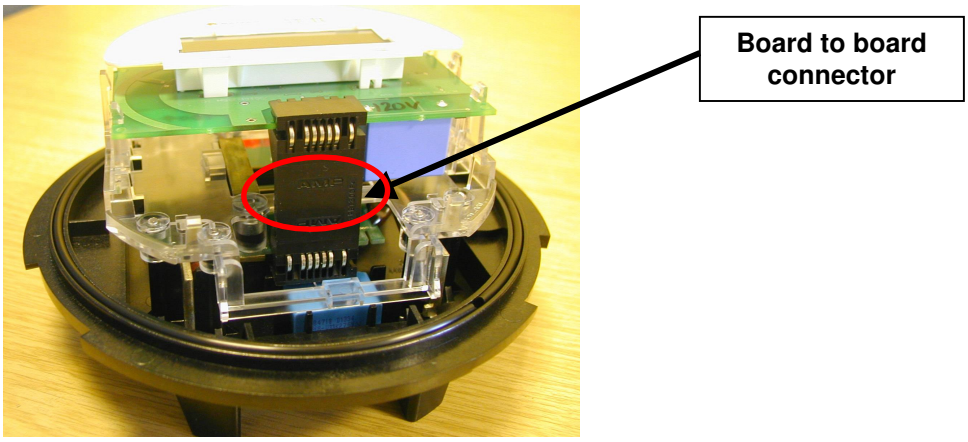


Figure 4: Removing the board to board connector

7. Remove the upper circuit board (if fitted), one side at a time, by pulling gently outwards on the meter frame snaps (see Figure 5) while lifting the module up.

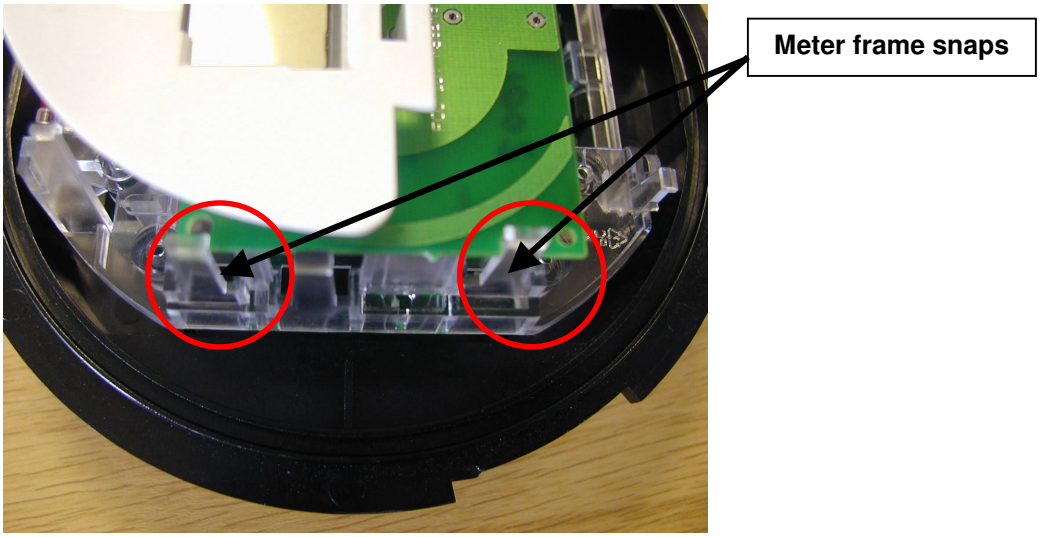


Figure 5: Meter frame snaps

8. Snap the new module into the meter frame by aligning the notches at the bottom of the circuit board with the lower two snaps (see Figure 6).

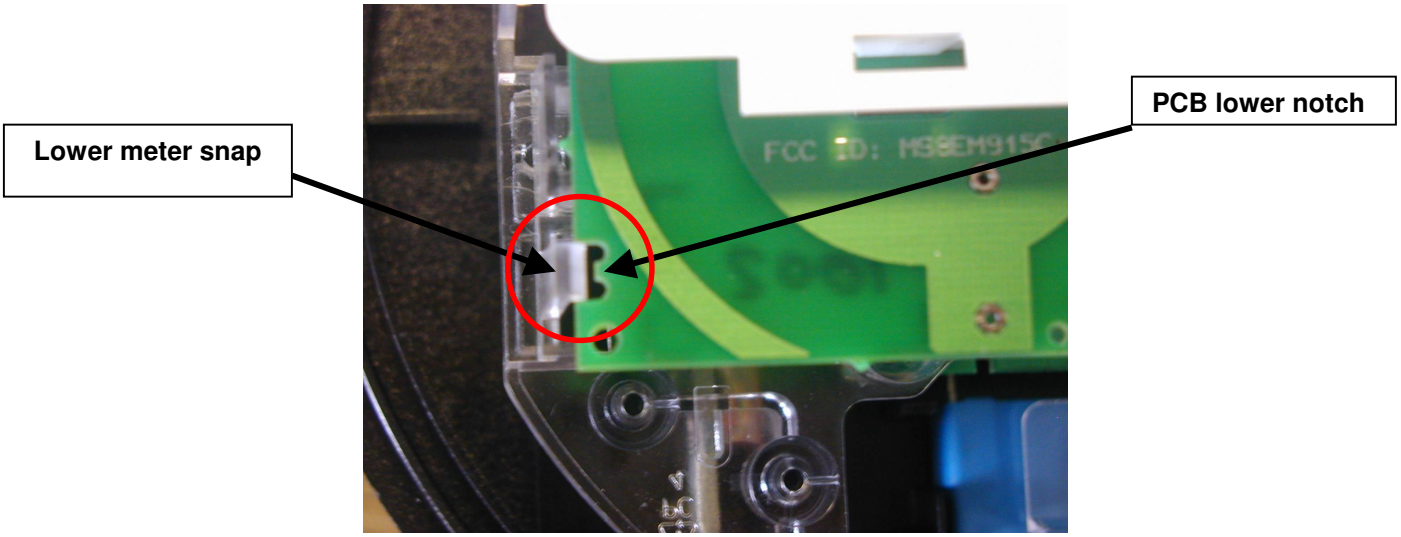


Figure 6: Alignment of PCB notch with meter snap

NOTE: The module must be aligned properly in the snaps to avoid damage to the connector or circuit board.

9. Replace the board-to-board connector by aligning the top of the connector with the notches in the circuit board (see Figure 7) and pressing gently at the bottom of the connector to mate with the metrology board (see Figure 8). The board-to-board connecter can be used either way up. Then, gently press the top of the connector to mate it to the TransPondIT (see Figure 9). The connector is seated correctly when you hear it snap into place

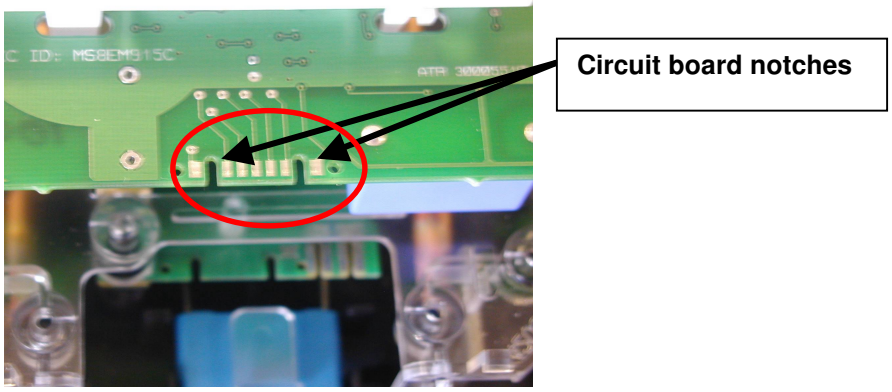


Figure 7: TransPondIT circuit board notched

Note: Use the meter base for leverage instead of the LCD holder. Pressure on the LCD holder may damage the TransPondIT

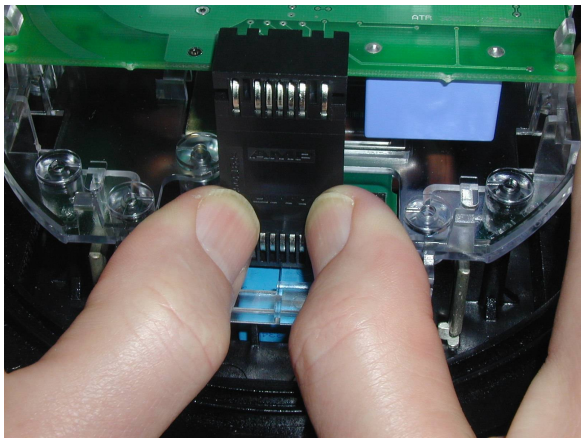


Figure 8: Board-to-board connector: BOTTOM

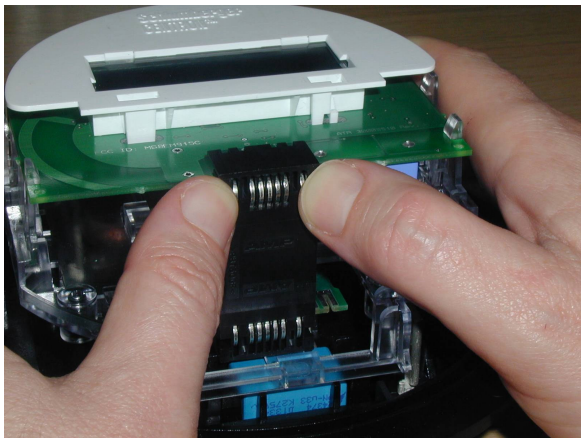


Figure 9: Board-to-board connector: TOP

10. Ensure the board-to-board connector is fully seated by pressing firmly on the middle of the connector.

11. Carefully replace the inner protective cover. Engage the top snaps first, taking care to place the slot at the top of the cover over IR light pipe. Failure to do so could break the light pipe. Ensure that the four meter base tabs are engaged with the top and bottom of the inner cover.

12. Apply the approvals label at 9 o'clock position in such a way that the bottom of the text is parallel with base of meter (see Figure 2).

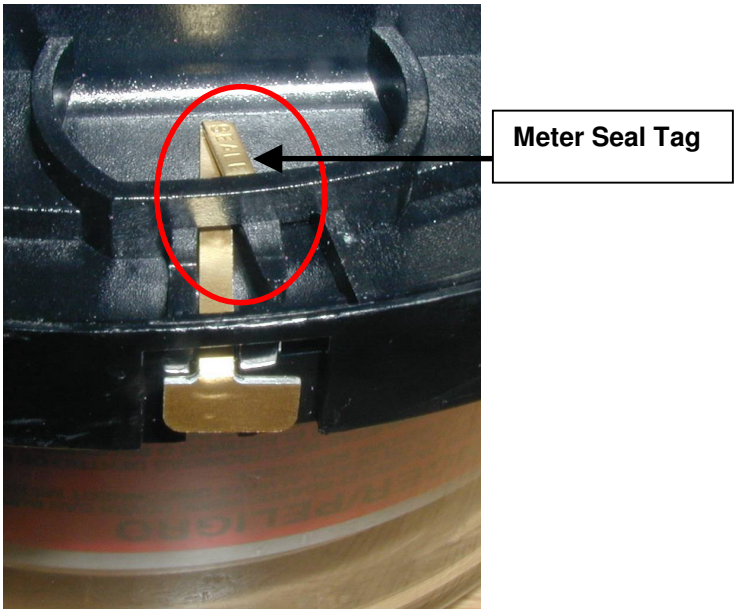
13. If configuration settings need to be modified, configure using the instructions in Chapter 3.

14. Replace the cover over the meter base until the flange on the cover is flush with the flange on the meter base.

15. Turn the cover 1/8 turn clockwise until the locking tabs are fully engaged with the meter base.

16. Fit new meter tamper seal through holes in meter base. (see figure 10)

Figure 10: TransPondIT installed in meter and location of meter seal tag



Chapter 3: CONFIGURING THE TRANSPONDIT

3.1 DEFAULT CONFIGURATION

TransPondITs are delivered with the following default configuration:

Parameter	Default Setting
Meter Reading (kWh)	0
Utility Code	55
TransPondIT ID	Factory Serial Number (on barcode)
Transmit Interval	5 seconds
Status/Error/Tamper Code	OK (0)
Display format	5*1
Detent option	Decrement meter reading on reverse energy flow
LCD segment test	KWh for 7 seconds, segment test for 1 second

Table 1: Default TransPondIT configuration

If these settings are acceptable then the TransPondIT is ready to use. If the settings are not acceptable, then the ConFigIT is used to re-program the TransPondIT.

3.2 CONFIGURABLE PARAMETERS

The following parameters can be configured:

- TransPondIT ID – (Example: to match the meter ID or to match Meter Point ID (0-16777215)).
- Meter reading (0 to 99999).
- Utility code – (Example: to provide differentiation from TransPondITs on water/gas meters or from those in neighboring utilities (0-255)).
- Format of the kWh reading on LCD (5*1 [kWh] or 4*10 [10's of kWh]).
- Reverse count handling function (detent register function).
- LCD segment test function.
- Status/Error/Tamper code.

3.3 PREPARATION OF CONFIGIT

The TransPondIT is configured by RAMAR's ConFigIT electric serial adaptor. The ConFigIT interfaces to the TransPondIT using a physical cable connection. The ConFigIT powers the TransPondIT during configuration - TransPondITs can be configured either on the bench (out of meter) or in the meter.
The TransPondIT should not be mains powered during the configuration process.

The ConFigIT kit includes:

- ConFigIT box
- 'Computer' serial cable *(Connections are wired straight through, terminated at both ends with 9-pin female 'D' connectors – NOTE not same as for letterbox ConFigIT for Water TransPondIT).*
- 'TransPondIT' serial cable *(Note: order spares from your CENTRON Meter supplier as 'Zeroer Cable' – Itron part no K442436-001)*
- CENTRON meter plug *(Note: order spares from your CENTRON Meter supplier as 'Zeroer Assy Welded' – Itron part no K442395-001)*

The ConFigIT is powered by 2 AA alkaline batteries (not included in kit). The battery compartment is on the rear of ConFigIT.
Another option is to power the ConFigIT with an external DC power supply (6-12VDC @ 200mA – not included in kit).

The ConFigIT application must be configured so that it uses the COM port that the TransPondIT is connected to. If the wrong COM port is used, then the error message as illustrated in figure 24 is displayed. To change the COM port interface, select **File – Interface** from the menu and select the correct COM port.

When battery operated, the ConFigIT On/Standby LED illuminates once the ConFigIT program is running and the correct COM port is selected. If the ConFigIT is not used for more than 20 seconds, the 'standby' mode activates indicated by a flashing On/Standby LED. The ConFigIT returns to its normal mode if there is communication activity within 60 seconds. If there is no activity before 60 seconds, the ConFigIT powers down and the LED turns off.

If the ConFigIT is powered by an external DC supply, it does not enter 'standby' mode or power down.