

## SERVICE ACTIVATION MADE EASY

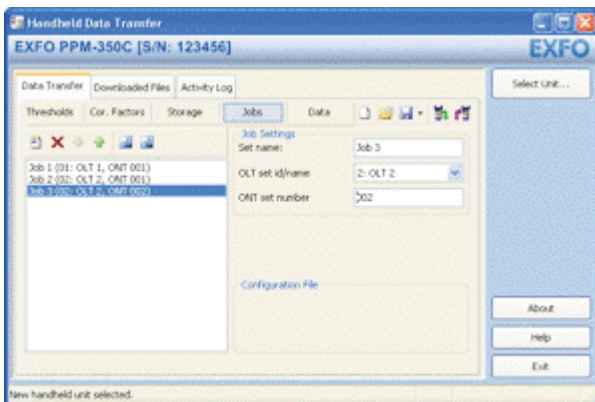
*By Vincent Racine, Product Manager, Optical Business Unit*

The service-activation phase may seem very straightforward at first glance, but, in fact, the task should not be taken lightly, as this is the moment the customer experience begins. The service-activation scheme can be very different, depending on the fiber-to-the-home (FTTH) network topology. New trends such as deployments in multidwelling or multitenant units (MDU/MTUs) often include pre-engineered plug-and-play components with multiple connection points or, alternately, they can also be deployed using an all-spliced approach. Another thing to keep in mind is that FTTH networks link one location to multiple locations, also called point-to-multipoint networks, where each drop fiber corresponds to a specific customer or optical network terminal (ONT), as opposed to legacy networks, where a fiber typically links one location to another.

In terms of data storage, passive optical network (PON) service activation therefore brings about two new dimensions:

1. Results should be linked to customers or ONTs instead of fibers
2. More than one test location may be required, typically two or three

Since the service-activation phase is often performed by subcontractors, reporting and data authenticity protection have become major factors in PON deployments, where hundreds of results may be generated for a single PON activation. So, following the right steps in the day-to-day activations ensures a smooth workflow and high productivity.

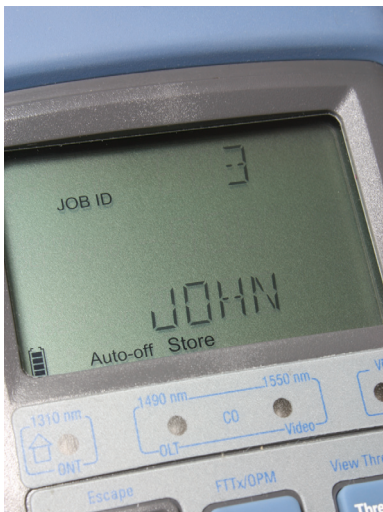


**Figure 1. The PPM-350C's Data Transfer tab**

### A Unique Workflow Management Solution

The new PPM-350C PON Power Meter comes with a full-fledged software solution, helping users from front to back office. The unit also includes a Job Editor mode, as well as post-processing and reporting tools.

In Job Editor mode, managers and technicians alike can pre-configure upcoming jobs by entering information about a specific customer or an ONT name/number, along with location, ONT and optical line terminal (OLT) identification corresponding to the network topology.



**Figure 2. The PPM-350C's Job Editor mode**

Once these jobs are created using a straightforward PC software application, they can be loaded onto the unit through a USB connection. Thanks to this innovative tool, users can now:

1. Integrate their workload directly into their PON power meter
2. Avoid bringing a pile of network plans and workload material in the field
3. Start testing right away without worrying about file names
4. Easily keep track of service-activation results per customer or ONT installation
5. Save time

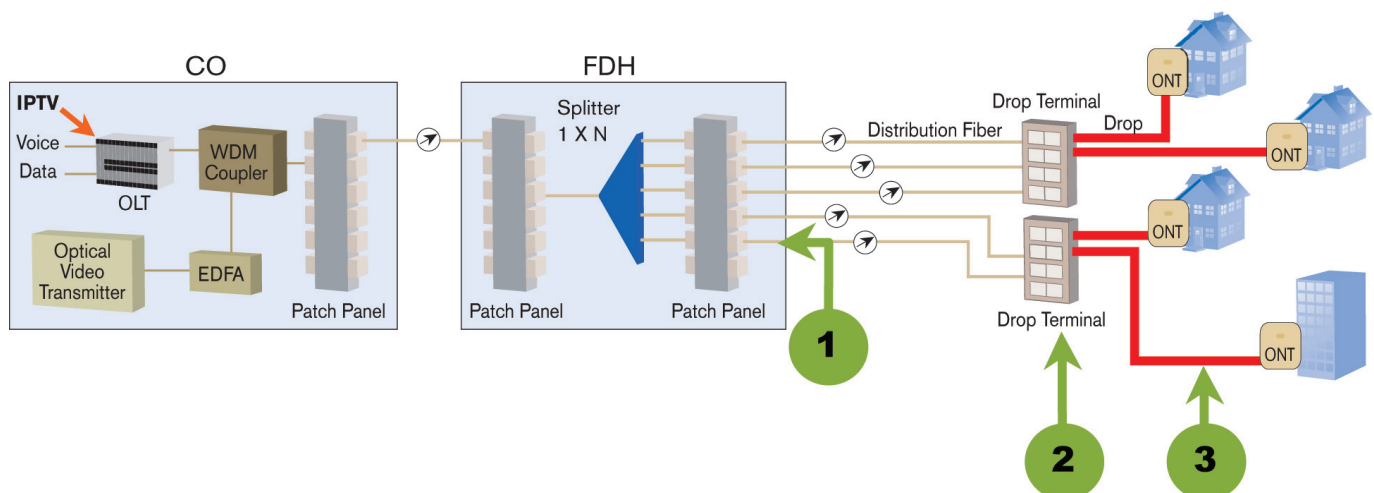
The PPM-350C's unique data management structure not only allows users to save results of pre-configured jobs, but also save results per OLT or central office (CO), per ONT and even per location.



**Figure 3.** The PPM-350C's PON-adapted graphical user interface—storage screen

## Multiple Testing Locations

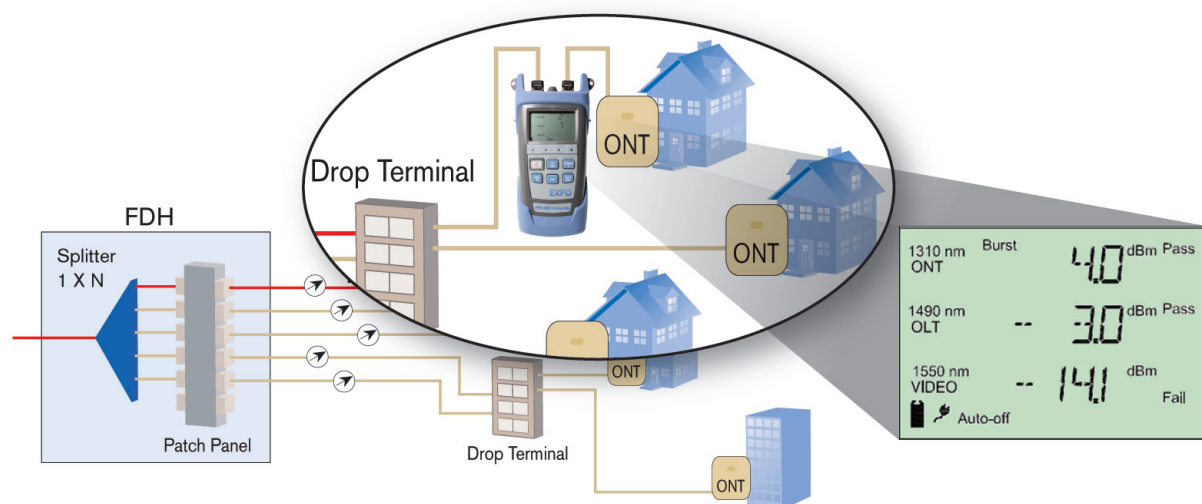
Verifying optical levels at various locations along the same fiber path helps users pinpoint problems and/or defective components before activating a customer's service. Since FTTH network problems are often caused by dirty or damaged connectors, component inspection greatly reduces troubleshooting, as power levels are verified for each network section. It is also highly recommended to inspect each connection point using a fiber inspection probe, such as the FIP-400, before each power measurement.



**Figure 4.** PPM measurements at different locations

## Testing Points

- 1** By performing a power-level certification at the splitter—more specifically at the output—users can verify if the splitter branch is working properly. This simple assessment allows them to confirm that all network components from the CO (including the feeder fiber, or F1) to the splitter output are in good condition. Typically, the FDH includes SC/APC or LC/APC connectors.
- 2** By performing a power-level certification at the drop terminal, users can characterize the distribution fiber and the drop terminal ports. Usually, a splice tray is included within the drop terminal, which can cause macrobend problems. Typically, the drop terminal includes OptiTap™ weatherproof connectors or mechanical splices.
- 3** The fiber connecting the drop terminal to the customer premises, also called the last mile or drop cable, is generally installed during service activation. To ensure reliable services to the customer, the network and the customer ONT must meet their specifications. The best way to guarantee this is to perform a pass-through connection to fully characterize all operating wavelengths (upstream and downstream) in the PON. The only way to achieve this at the service-activation phase is to use a dual-port PON power meter with a pass-through connection, like the PPM-350C; otherwise, it will only certify downstream signals from the CO.



**Figure 5. Pass-through testing of all wavelengths**

## Using EXFO's FastReporter for True FTTx PON Reporting

Back at the office, users can download all test results stored in the unit directly into FastReporter. Post-processing functions such as pass/fail assessment with specific thresholds may be performed.


Having named all files prior to the testing session, users will not waste their time renaming them. Since the naming structure was done correctly from the start, reporting is performed in a few minutes.

FastReporter offers an innovative FTTx Service Activation reporting tool, which generates reports with the following information:

1. Power level for each wavelength and each location
2. Time stamp for each measurement
3. Pass/warning/fail status
4. Thresholds used to perform the pass/warning/fail assessment

|  |   |             |        |                                  |  |
|--|---|-------------|--------|----------------------------------|--|
| OLT ID: 02 Center <---> ONT ID:22<br>[JOB ID: Roger] |   |             |        | PASS                             |  |
| Location   | Wavelength (nm)   | Power (dBm) | Status | Date/Time<br>(MM/DD/YY HH:MM.SS) |  |
| DROP   | 1310  | 0.9         | PASS   | 10/01/09 13:45:28                |  |
|  | 1490  | -7.1        | PASS   |                                  |  |
|  | 1550  | 3.1         | PASS   |                                  |  |
| ONT  | 1310  | 1.2         | PASS   | 10/01/09 13:54:32                |  |
|  | 1490  | -7.4        | PASS   |                                  |  |
|  | 1550  | 3.4         | PASS   |                                  |  |
| Comment:   | ONT installed on the driveway side of the home close to side entry. |             |        |                                  |  |

**FTTx Service activation report**  
**Job information**  
 Report date: 10/03/2009  
 Customer: 135 129 4685  
 Contractor: 13542  
 Job name: FTM-013C  
 Serial number: 345532



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**Power level measurements**

| OLT ID: 02 Center <---> ONT ID:22<br>[JOB ID: Roger] |                 |             |        | PASS                          |  |
|--|-----------------|-------------|--------|-------------------------------|--|
| Location   | Wavelength (nm) | Power (dBm) | Status | Date/Time (MM/DD/YY HH:MM.SS) |  |
| DROP   | 1310            | 0.9         | PASS   | 10/01/09 13:45:28             |  |
|  | 1490            | -7.1        | PASS   |                               |  |
|  | 1550            | 3.1         | PASS   |                               |  |
| ONT  | 1310            | 1.2         | PASS   | 10/01/09 13:54:32             |  |
|  | 1490            | -7.4        | PASS   |                               |  |
|  | 1550            | 3.4         | PASS   |                               |  |

Comment: ONT installed on the driveway side of the home close to side entry.

APPLIED THRESHOLDS

| Location | Wavelength (nm) | Pass (dBm) | Warning (dBm) | Fail (dBm) |
|----------|-----------------|------------|---------------|------------|
| DROP     | 1310            | -5.0       | -20.0         | -25.0      |
|          | 1490            | -5.0       | -20.0         | -25.0      |
|          | 1550            | -5.0       | -20.0         | -25.0      |
| ONT      | 1310            | -2.5       | -4.0          | -5.0       |
|          | 1490            | -2.5       | -4.0          | -5.0       |
|          | 1550            | -13.5      | -5.2          | -8.2       |

**Figure 6. Screen shot of FTTx Service Activation reporting tool**

The Right Tools

EXFO's line of PON-optimized products addresses each phase of FTTx network deployments. For service-activation tasks, the PPM-350C PON Power Meter teamed with an FIP-400 Fiber Inspection Probe and an FTB-100 Mini-OTDR enable quick and easy service activation.

The new PPM-350C was designed with true PON service-activation realities in mind. With its innovative workflow management, this instrument demystifies and simplifies service-activation tasks by offering easy-to-use features:



- Truly rugged and weatherproof
- All-wavelength testing
- Pass-through connection for burst measurements
- PON-adapted storage interface
- Pass/fail automated assessment
- Job Editor mode
- Reporting software
- Proprietary data format ensuring authenticity of test results

Figure 7. PPM-350C PON Power Meter

|  |  |  |                           |  |  |
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