


Able Platform: Partner Integration

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Integration with the Able Platform enables partners to acquire and integrate clinically validated grip and gait measurement data in your workflows. Depending upon your integration requirements, this can be provided through automatic, real-time, push, pull, or batch-based data synchronization.

Additional insights complement standard grip and gait measurements including normative values and cut-offs highlighting *position* within a certain demographic (e.g. age and gender) or associated risk levels, for example, falls. A significant body of research demonstrates high measurement quality e.g. reliability, accuracy, sensitivity, and robustness, especially when compared to publicly available datasets and existing gold-standard measurement tools.

This document outlines the integration process for connecting external partner systems with our multi-tenant assessment platform. The integration leverages organization-based multi-tenancy with secure data synchronization capabilities.

 This document is intended for technical staff and engineers responsible for integrating the Able Platform multi-tenant assessment platform with your partner system.



1 Overview

The Able Platform comprises the following components that can be packaged together based on your requirements:

- **GripAble Sensor** - our custom sensor that combines sensitive force sensing with dynamic motion tracking enabling comprehensive hand function measurement during assessment and training activities. Measurement data is captured at 50 Hz and streamed over BLE in real-time.
- **Able Mobile App** - our simple app that enables individuals as well as health care professionals to quickly log in, connect a GripAble sensor and record a grip or gait measurement. The app can run on Android and iOS devices including smartphones and tablets.
- **Able Portal** - our simple web portal that enables a healthcare professional to perform key administration tasks such as user onboarding, configure test parameters, access cohort-level data insights, etc.
- **Able Admin** - a separate admin portal that enables a back-office user to manage the organisation, generate API keys and create users.
- **Able Backend** - our APIs based on OpenAPI and gRPC specs allow direct integration between our secure and regionalized backend services, and your system(s). This promotes interoperability by, for example, simplifying user onboarding, ensuring a common set of user identifiers and automatically pulling test and sensor data into your system(s), etc.
- **Partner System** - is an external system or service that connects with our Able Backend platform to synchronize data such as individual records and measurement results. The partners leverage APIs to actively interact with our platform or web-hooks and batch-exports to passively receive updated information.

2 Solution

2.1 Domain data

Our central entity is the **Individual** which models a patient, a resident in a care facility, etc. that takes grip and gait measurements using a Gripable Sensor. This entity captures relevant information about the person such as birthdate, dominant hand, height, etc. The **Individual** can be optionally assigned to a healthcare professional (**Provider**), which is a specialized user account within an **Organization**.

From a data management perspective, the **Organization** is the *tenancy-key* in our shared-database tenancy model. The organization identifier is used to logically partition the data and remove any risk of cross-organization data sharing. An **Organization** can enroll an **Individual** across multiple care-homes (**Facilities**).

Measurements, such as Single Maximum Grip Test, or different Gait tests are captured through the Able Assess mobile app and stored against the **Individual**. These measurements can be viewed directly by the individual (if an email address was provided during enrollment) or via the healthcare professional they are assigned to.

2.2 Access control

Access to data within an **Organization** is granted depending on the user's type. Our system has three **User** types:

- **Individual** manages and has access to their own data only.
- **Provider** is a healthcare professional that manages patients of a healthcare **Facility**.
- **Operator** is a back-office user who can manage users, their assignment to facilities, etc. for their **Organization** but has no access to health-related information.



Users associated with an **Organization** only have access to that organization's data.

An **Organization** that does not have multiple facilities can just use one "default" **Facility**.

2.3 Authentication

Users of the mobile app and web portal authenticate themselves with email and a one-time-password (OTP) combination.

API clients authenticate by means of API Tokens which will be generated/accessed by the **Operator**.

- If the partner requires alternative or additional authentication methods, including multi-factor authentication (MFA), SSO, PIN - contact the Able Care team to discuss options

2.3.1 Authentication flows and measurements

There are two ways in which individuals can record measurements:

- Users of type **Individual** log into their account and take measurements.
- Users of type **Provider** log into their account, select the **Individual** that is taking the measurement and then record the measurements against the selected **Individual**.

In both cases the measurement data for the Individual will be associated with the **Facility** and **Organization** they are assigned to.

2.4 Operation modes

The Able Platform supports two key operation modes:

2.4.1 Supervised operation

During supervised mode, a healthcare **Provider** will guide a cohort of individuals during grip and gait measurements. This is mostly used in care homes, medical facilities, etc. where measurements are a scheduled and recurring activity.

Key assumptions include:

- Multiple host devices - implying one or more devices (smartphones, tablets, iOS/Android)
- Multiple sensors - implying one or more GripAble Sensors
- Multiple **Individuals** - interchangeably taking grip measurements
- Multiple **Providers** - interchangeably supervising **Individuals**


- Given this setup, it is expected that at any point in time, an **Individual** could record measurements across multiple host devices, sensors and **Providers** within a single **Organization**

2.4.2 Unsupervised operation

In unsupervised mode, the grip and gait measurements will be self-administered, from the comfort of one's home.

Key assumptions include:

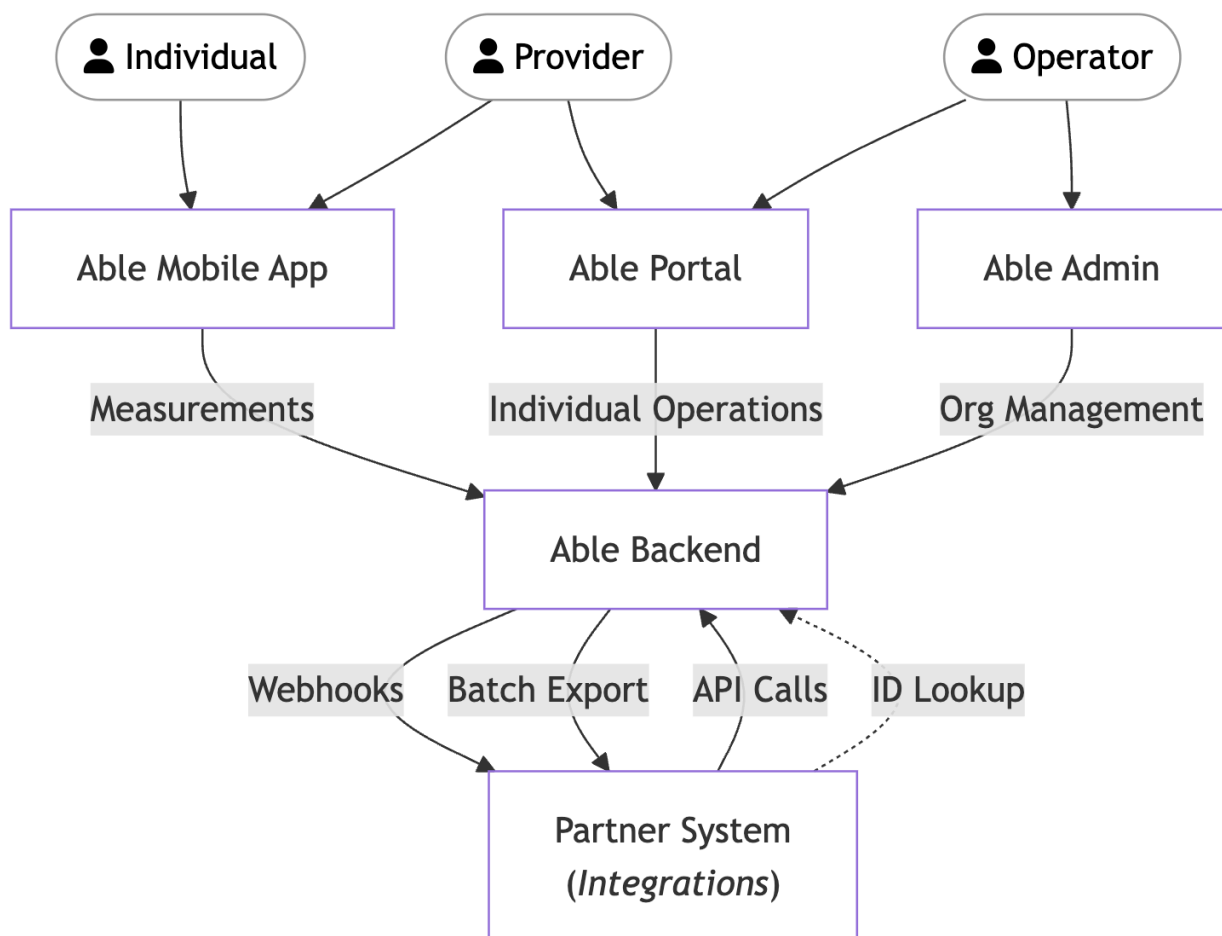
- Single host device
- Single sensor
- Single individual/user

 The data of **Individual** that belong to an **Organization** will be available to **Providers** of the **Organization**.

3 Integration Architecture

Integration is configured at the **Organization** level. An **Organization** can choose to integrate with one or more integration **Partners** in which case updates to the organization's data will be sent to (or synchronized) with partners approved by the **Organization**.

To enable integration, all data that *belongs to* an **Organization** including **User**, **Facility** and **Measurement**, and will be identified as such. This enables single-database multi-tenancy based on the **Organization** and makes organization-based data synchronization possible based on webhooks, queues or other synchronization APIs.



1 Overview of how the Able Platform integrates with Partner Systems

3.1 Multi-Tenancy Model

- **Organization-based filtering:** All data records are tied to the specific organization they belong.
- **Isolated queries:** All data access is automatically filtered by organization context.

- **Secure boundaries:** Each organization's data remains isolated

3.2 User Management

3.2.1 Enrolment

We have simple and easy enrollment procedures that works across all operating modes:

1. An **Organisation** will be created by Able Care following contractual approval.
2. An **Operator** account will be created by Able Care and securely provided to the **Partner**.
3. The **Operator** will be able to log into Able Admin and create **Facilities** and additional **Users** (**Operators**, **Providers** and **Individuals**).
4. **Providers** can log into the Able Mobile App or Able Portal, create **Individuals** and take measurements against that **Individual**.
5. **Individuals** existing in the Partner System can be enrolled into our system through our REST API.



Additionally, we can pre-load your provider and individuals' data in bulk into our system to reduce manual work - contact the Able Care team to discuss this as an option

We've built the system so that your individual identifiers need only be unique to your group of individuals.

3.2.2 Matching Individuals

The most critical point of data integration is that the same identifier be used for an individual taking multiple measurements over time. Individuals represent the core entity being assessed and have the following:

- **Demographic information:** data points like date of birth, handedness, height, etc. are used for evaluating and scoring measurements for the individual.
- **Authentication capability:** individuals can authenticate to take measurements as described in "*Authentication flows and measurements*".
- **Identifiers** to map and identify the individual to external partner systems.



There are two options to match the **Individual** between the Able Care platform and an integration partners system:

1. **External Reference** is a read/write field intended to store a reference string for the **Individual** from an integration partner's system. This field can be used by an integration partner to *inject* a unique identifier for each **Individual**. When set, this field will be included in all data transfers to enable identification and matching of the **Individual** in partner systems. This identifier may be either the individual's ID in the partner system, or a mapping value which can be used by the partner system to look up the individual or compute its identifier.
2. **Internal ID**: read-only internal identifier (UUID) of the individual in the Able Care platform. When using the REST API for creating **Individuals**, the integration partner will receive the Individual ID in the API response. If the **Individual** was manually created via the Provider account then a semantic listing of **Individuals** filterable by **Organisation**, **Facility** or **Provider** will be provided through a REST API or Able Admin.



Sensor ID matching: in cases where a sensor is assigned to a specific **Individual** (i.e. at their home), the individual matching can be done by keeping track of inventory. However, this is only recommended to support specific edge cases where one of the two options provided above is not possible.

4 Integration Approaches

4.1 Individual Matching Strategies

The identifiers associated with the **Individual** entity will differ between the two systems and will need to be matched and can either be stored in the Able Care Platform or Partner System.

Option 1: External Reference Matching

- Store an identifier in the provided External Reference field
- Capture this External Reference field in API responses
- Use this field to match individuals during synchronization

 Option 1 requires sharing external identifiers with our system

Option 2: Internal ID Tracking

- Capture the Able Care Platform's Internal ID in API responses
- Store this ID within the partner's external system
- Eliminates need to share potentially sensitive identifiers from integration partner's systems

 Option 2 is the recommended approach for enhanced security

4.2 Dataflow

4.2.1 Real-time Synchronization

These are **continuous data flows** that ensures external the systems stay current with latest changes in the data:

1. **Webhooks for immediate updates:** Receive notifications for each measurement update
2. **Event-driven architecture:** Triggered by specific actions (measurements completed, results calculated)

4.2.2 Batch Synchronization

These are **periodic bulk exports** scheduled data transfers at defined intervals:

1. **Webhook-based batching:** Accumulated updates sent in batches

2. **Data upload integration:** Direct file-based transfers for large datasets

4.3 API Configuration

- HTTP API endpoints will be provided as an OpenAPI spec
- An **Operator** can access **Organisation** info and generate API keys/tokens in the Able Admin.
- The partner configures authentication and endpoints as required for the integration

5 Additional Considerations

5.1 Security

- **Organization isolation:** Data access automatically scoped to correct organization
- **Secure matching:** Choose appropriate individual matching strategy based on security requirements
- **API authentication:** All endpoints require proper authentication
- **Data encryption:** The data is encrypted at-rest as well as in-transit

5.2 Technical

- **API Access:** All data is exposed via RESTful APIs
- **Webhook Support:** For real-time and batch synchronization
- **Data Format:** JSON-based data exchange
- **Error Handling:** API calls that result in errors will include `error_code` and `message` fields in the JSON response. The caller should apply a recovery mechanism, like retrying with a backoff algorithm.